ENCYCLOPEDIA OF NURSING RESEARCH

THIRD EDITION

Editors

Joyce J. Fitzpatrick

Meredith Wallace Kazer

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Encyclopedia of
Nursing Research

Third Edition

Joyce J. Fitzpatrick, PhD, MBA, RN, FAAN, FNAP, is the Elizabeth Brooks Ford Professor of Nursing at the Frances Payne Bolton School of Nursing, Case Western Reserve University (CWRU) in Cleveland, Ohio, where she was the dean from 1982 through 1997. She holds an adjunct position as a professor in the Department of Geriatrics, Mount Sinai School of Medicine, New York, New York. She earned a BSN at Georgetown University, an MS in Psychiatric-Mental Health Nursing at Ohio State University, a PhD in Nursing at New York University, and an MBA from CWRU in 1992. In May 1990, Dr. Fitzpatrick received an honorary doctorate, Doctor of Humane Letters, from her alma mater, Georgetown University. She has received numerous honors and awards; she was elected a fellow in the American Academy of Nursing in 1981 and a fellow in the National Academies of Practice in 1996. She has received an *American Journal of Nursing* Book of the Year Award 18 times. In 2002, Dr. Fitzpatrick received the American Nurses Foundation Distinguished Contribution to Nursing Science Award for her sustained commitment and contributions to the development of the discipline. She received the STTI Lucie Kelly Mentor Award in 2003 and the STTI Founders Award for Leadership in 2005. For 2007 to 2008, she served as a Fulbright Scholar at University College Cork, Cork, Ireland.

Dr. Fitzpatrick is widely published in nursing and health care literature having more than 300 publications. She served as coeditor of the *Annual Review of Nursing Research* series, volumes 1 through 26; she currently edits the journals *Applied Nursing Research*, *Archives in Psychiatric Nursing*, and *Nursing Education Perspectives*, the official journal of the National League for Nursing. Dr. Fitzpatrick edited two editions of the classic *Encyclopedia of Nursing Research* and a series of nursing research digests. In 2008, she edited *The Doctor of Nursing Practice and Clinical Nurse Leader*, published by Springer Publishing. Her recent books published by Springer Publishing include *Giving through Teaching: How Nurse Educators Are Changing the World*, published in June 2010, and *Problem Solving for Better Health: A Global Perspective*, published in October 2010.

Dr. Fitzpatrick founded and led the Bolton School's World Health Organization Collaborating Center for Nursing; she has provided consultation on nursing education and research throughout the world, including universities and health ministries in Africa, Asia, Australia, Europe, Latin America, and the Middle East. She served as a project director for a Nursing Care Quality Initiative, a multisystem, 10-hospital project focused on improving the care for hospitalized elders and their families funded by the New York Health Alliance and the Brookdale Foundation. In summer 2008, she was appointed the first Spratt Center for Nursing Education and Research Visiting Scholar at Danbury Hospital in Connecticut. She has served as the chair of the Global Advisory Committee for the Center for Nursing Research and Education at the Mount Sinai School of Medicine.

Meredith Wallace Kazer, PhD, APRN, CNL, A/GNP-BC, FAAN, completed her BSN degree magna cum laude at Boston University in 1988. She earned an MSN in medical-surgical nursing with a specialty in geriatrics at Yale University and a PhD in nursing research and theory development at New York University. While at New York University, she was awarded a predoctoral fellowship at the Hartford Institute for Geriatric Nursing. In this capacity, she became the original author and editor of *Try This: Best Practices in Geriatric Nursing* series. In 2001, she won the Springer Publishing Company Award for Applied Nursing Research. She was the managing editor of the *Journal of Applied Nursing Research* and is currently the research brief editor for the journal.

Dr. Kazer is the author of numerous journal articles and book chapters. She published *Prostate Cancer: Nursing Assessment Management and Care* in April 2002, which won an *American Journal of Nursing* Book of the Year Award. Preceding this, she was the associate editor of *The Geriatric Nursing Research Digest* in 2002 and the associate editor of the second edition of the *Encyclopedia of Nursing Research* published in 2006, both of which also won the *American Journal of Nursing* Book of the Year Awards. She is a recent recipient of the Eastern Nursing Research Society/John A. Hartford Foundation junior investigator award. She is an adult nurse practitioner and currently maintains a practice in primary care with a focus on chronic illness in the elderly. She is currently an associate professor at Fairfield University School of Nursing, Fairfield, Connecticut and was recently inducted into the American Academy of Nursing.

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Joyce J. Fitzpatrick, PhD, MBA, RN,
FAAN, FNAP

Meredith Wallace Kazer, PhD, APRN,
CNL, A/GNP-BC, FAAN

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PREFACE

This third edition of the *Encyclopedia of Nursing Research* (*ENR*) is a comprehensive, authoritative, yet concise guide to current nursing research literature. The first edition of *ENR* grew out of the commitment of Dr. Ursula Springer to nursing research and my commitment to nurse scholars globally.

The first edition of *ENR* followed 15 volumes of the *Annual Review of Nursing Research* (*ARNR*) journal. The second edition was published incorporating terms from the first 22 volumes of *ARNR*. This third edition of *ENR* not only incorporates topics from the first two editions but also adds content through the 30 volumes of *ARNR* that have been published to date. In preparing and in organizing the content we were cognizant of the current depth of nursing research in some areas, for example, geriatric nursing, in which there has been a major investment of resources and thus substantive science development.

Nurses at all levels of preparation and in all clinical specialties will find this an important introduction to the extent of nursing research. Previous editions have been most helpful to basic and graduate students. The summary entries provide the reader with an important starting point for future content and references and a timely source of the most relevant and recent research. The alphabetical ordering of entries is provided to assist the reader in easily locating a topic. Every effort has been made to be inclusive of all relevant terms in nursing research, which were selected on the basis of the review of previous editions and the extant nursing research literature.

This work would not have been possible without the dedication of a number of individuals. First, we would like to acknowledge the nurse researchers whose scientific work and resultant publications led to the inception of an encyclopedia. Second, we thank all of the contributors from the three editions for their careful review of the literature and their synopses of the research. We also thank the staff of Springer Publishing Company, led by our publisher, Allan Graubard, for their thoughtful review and editing of this volume. Collectively, we have all contributed to another important work, one that we should proudly exclaim as the culmination of more than four decades of nursing research.

Joyce J. Fitzpatrick
Editor

CONTRIBUTORS

Lauren S. Aaronson, PhD, RN, FAAN
Professor, University of Kansas School of Nursing, Deputy Director, Heartland Institute for Clinical and Translational Research, University of Kansas Medical Center, Kansas City, Kansas
Data Analysis, Fatigue, Grantsmanship, Sampling

Faye G. Abdellah, EdD, ScD, RN, FAAN
Professor Emeritus, Graduate School of Nursing, Uniformed Services University of the Health Sciences, Bethesda, Maryland
History of Nursing Research

Ivo Abraham, PhD, RN
Professor and Director, Center for Health Outcomes and Practice Effectiveness, College of Pharmacy, University of Arizona, Tucson, Arizona, Chief Scientist, Matrix45, Earlysville, Virginia
Applied Research, Comparative Effectiveness Research, Experimental Research, Quasi-Experimental Research

Raeda Fawzi AbuAlRub, RN, PhD
Associate Professor, Vice Dean, Faculty of Nursing, College of Nursing, Jordan University of Science and Technology, Irbid, Jordan
Social Support

Ivy M. Alexander, PhD, APRN, ANP-BC, FAAN
Professor and Director, Adult, Family, Gerontological, and Women's Health and Primary Care Specialty, School of Nursing, Yale University, New Haven, Connecticut
Women's Health

Cecilia D. Alvarez, DNP, RN
Nurse Manager, Coronary Care Unit, Central Telemetry, and Rapid Response Team, Hackensack University Medical Center, Hackensack, New Jersey, Assistant Professor, Fairleigh Dickinson University, Teaneck, New Jersey
Patient Satisfaction

Gene Cranston Anderson, PhD, RN, FAAN
Edward J. and Louise Mellen Professor Emerita of Nursing, Frances Payne Bolton School of Nursing, Case Western Reserve University, Cleveland, Ohio, Professor Emeritus and Courtesy Faculty, College of Nursing, University of Florida, Gainesville, Florida
Kangaroo Care (Skin-to-Skin Contact)

Ida Androwich, PhD, RNC, FAAN
Professor, School of Nursing, Loyola University Medical, Center Maywood, Illinois
Nursing Information Systems

Karen J. Aroian, PhD, CNAA-BC
Katharine Faville Professor of Nursing Research, College of Nursing, Wayne State University, Detroit, Michigan
Immigrant Women

Carol A. Ashton, PhD, RN
Director of Nursing, Research LDS, Cottonwood, and Alta View Hospitals, Salt Lake City, Utah
Research Utilization

Joan K. Austin, PhD, RN, FAAN
Distinguished Professor Emerita, School of Nursing, Indiana University, Indianapolis, Indiana
Epilepsy

Kay C. Avant, PhD, RN, FAAN
Professor/Roger L. and Laura D. Zeller Charitable Foundation Professorship, School of Nursing, University of Texas Health Science Center, San Antonio, Texas
Concept Analysis

Cynthia G. Ayres, PhD, RN
Assistant Professor, Rutgers College of Nursing, Rutgers, The State University of New Jersey, Newark, New Jersey
Clinical Preventive Services

Terry A. Badger, PhD, PMHCNS-BC, RN, FAAN
Professor and Director, Community and Systems Health Science Division, College of Nursing, University of Arizona, Tucson, Arizona
Depression in Families

Marianne Baernholdt, PhD, MPH, RN
Assistant Professor, Department of Public Health Sciences, School of Nursing, University of Virginia, Charlottesville, Virginia
Rural Health

Donald E. Bailey, PhD, RN
Associate Professor, Senior Fellow, Center for the Study of Aging and Human Development, Claire M. Fagin Fellow, John A. Hartford Foundation, School of Nursing, Duke University, Durham, North Carolina
Active Surveillance for Prostate Cancer

Carolyn Baird, DNP, MBA, RN-BC, CARN-AP, ICCDPD
Adjunct Faculty, Waynesburg University, McMurray, Pennsylvania
Addiction Care

Tamilyn Bakas, PhD, RN, FAHA, FAAN
Professor, School of Nursing, Indiana University, Indianapolis, Indiana
Stroke

Suzanne Bakken, RN, DNSc, FAAN, FACMI
Alumni Professor of Nursing and Professor of Biomedical Informatics, Director, Center for Evidence-based Practice in the Underserved, Director, Reducing Health Disparities through Informatics Pre- and Postdoctoral Training Program, Columbia University, New York, New York
Active Surveillance for Prostate Cancer, Formal Nursing Languages, SNOMED Clinical Terms

Cheryl Tatano Beck, DNSc, CNM, FAAN
Professor, University of Connecticut School of Nursing, Storrs, Connecticut
Meta-Analysis, Phenomenology, Replication Studies

Abir K. Bekhet, PhD, RN, HSMI
Assistant Professor, College of Nursing, Marquette University, Milwaukee, Wisconsin
Depression in Older Adults

Sandra C. Garmon Bibb, DNSc, RN
Associate Professor, Chair, Department of Health Systems, Risk, and Contingency Management, Graduate School of Nursing, Uniformed Services University of the Health Sciences, Bethesda, Maryland
Leininger's Theory of Culture Care Diversity and Universality, Population Health

Alyson Blanck, MSN, RN, NEA-BC
Director of Nursing Practice, Danbury Hospital, Danbury, Connecticut
Patient Education

Meg Bourbonniere, PhD, RN
Vice President for Nursing Research, Thomas Jefferson University Hospital, Philadelphia, Pennsylvania
Physical Restraints

Diane K. Boyle, PhD, RN
University of Kansas, School of Nursing, Kansas City, Kansas
Job Satisfaction

Geraldine A. Britton, PhD, RN
Assistant Research Professor, Decker School of Nursing, Binghamton University, Binghamton, New York
Osteoporosis

Dorothy Brooten, PhD, FAAN
Professor, School of Nursing, Florida International University, Miami, Florida
Clinical Trials

Helen Kogan Budzynski, PhD, FAAN
Faculty Emeritus, School of Nursing, University of Washington, Seattle, Washington
Biofeedback

Christopher J. Burant, PhD, RN
Assistant Professor, Frances Payne Bolton School of Nursing, Case Western Reserve University, Cleveland, Ohio
Factor Analysis

Sara L. Campbell, PhD, RN, NEA-BC
Professor, School of Nursing, Illinois State University, Normal, Illinois
Feminist Research Methodology

Suzanne Hetzel Campbell, PhD, WHNP-BC, IBCLC
Associate Dean for Academic Programs, Associate Professor and Graduate Program Director, Fairfield University School of Nursing, Project Director, Robin Kanarek Learning Resource Center, Fairfield, Connecticut
Breastfeeding, Simulation

Jeeyae Choi, RN, DNSc
Clinical Informatician, Spaulding Rehabilitation Hospital, Boston, Massachusetts
Formal Nursing Languages

Sean P. Clarke, RN, PhD, FAAN
RBC Chair in Cardiovascular Nursing Research, Lawrence S. Bloomberg Faculty of Nursing, University of Toronto, Peter Munk Cardiac Centre, University Health Network, Toronto, Ontario, Canada
Nurse Staffing, Organizational Culture, Organizational Design

Amy Coenen, PhD, RN, FAAN
International Council of Nurses, College of Nursing, University of Wisconsin–Milwaukee, Milwaukee, Wisconsin
International Classification for Nursing Practice

Marlene Zichi Cohen, PhD, RN, FAAN
Professor and Kenneth E. Morehead Endowed Chair in Nursing, Associate Dean for Research, College of Nursing, University of Nebraska Medical Center, Omaha, Nebraska
Descriptive Research, Nursing Assessment

Rosemary Collier, MSN, RN
PhD Student, Decker School of Nursing, Binghamton University, Binghamton, New York
Osteoporosis

Inge B. Corless, RN, PHD, FAAN
Amelia Peabody Professor of Nursing Research, Institute of Health Professions, Massachusetts General Hospital, Boston, Massachusetts
Hospice, Terminal Illness

Sile A. Creedon
Catherine McAuley School of Nursing and Midwifery, Brookfield Health Sciences Complex, University College Cork, Cork, Ireland
Infection Control, Nosocomial Infections

Sabina De Geest, PhD, RN
Professor and Director, Institute of Nursing Science, University of Basel, Basel, Switzerland
Applied Research

Alice S. Demi, PhD, RN, FAAN
Professor, Byrdine F. Lewis School of Nursing, Georgia State University, Atlanta, Georgia
Delphi Technique

Mary Jo Devereaux
Hospital Librarian, Community Medical Center, Scranton, Pennsylvania
Orem's Self-Care Theory

Rose Ann DiMaria-Ghalili, PhD, RN
Associate Professor, Doctoral Nursing Department, John A. Hartford Foundation Claire M. Fagin Fellow, College of Nursing and Health Professions, Drexel University, Philadelphia, Pennsylvania

Nutrition in the Elderly

Kristy Dixon, MS, RN, NEA-BC
Director of Patient Care–Critical Care, Cardiology, Emergency, Trauma, Danbury Hospital, Danbury, Connecticut
Advance Directives

Moreen Donahue, DNP, RN, NEA-BC
Senior Vice President, Patient Care Services and Chief Nurse Executive, Danbury Hospital, Danbury, Connecticut
Clinical Judgment

Sue K. Donaldson, PhD, RN, FAAN
Dean and Professor, School of Nursing, Johns Hopkins University, Baltimore, Maryland
Basic Research

Dianna Hutto Douglas, DNS APRN-CNS
Professor, Health Science Center, School of Nursing, Louisiana State University, New Orleans, Louisiana
Empathy

Evelyn G. Duffy, DNP, G/ANP-BC, FAANP
Assistant Professor, Director of the Adult-Gerontological Nurse Practitioner Program, Associate Director of the University Center on Aging and Health, Frances Payne Bolton School of Nursing, Case Western Reserve University, Cleveland, Ohio
Osteoporosis

Jacqueline Dunbar-Jacob, PhD, RN, FAAN
Professor, Nursing, Psychology, Epidemiology, and Occupational Therapy, Dean, School of Nursing, University of Pittsburgh, Pittsburgh, Pennsylvania
Adherence/Compliance, Behavioral Research

Patricia C. Dykes, RN, DNSc
Corporate Manager Nursing Informatics and Research, Partners HealthCare, Wellesley, Massachusetts
Clinical Judgment, Nursing Information Systems

Emerson E. Ea, DNP, APRN, BC, CEN
Clinical Assistant Professor, College of Nursing, New York University, New York, New York
Acculturation

Shelly Eisbach, PhD, RN
Morton and Jane Blaustein Postdoctoral Fellow in Mental Health and Psychiatric Nursing, School of Nursing, Johns Hopkins University, Baltimore, Maryland
Mother–Infant/Toddler Relationships

Marsha L. Ellett, PhD, RN
Professor, School of Nursing, Indiana University, Indianapolis, Indiana
Enteral Tube Placement

Veronica F. Engle, PhD, FGSA, FAAN
Professor, College of Nursing and College of Medicine, University of Tennessee Health Science Center, Memphis, Tennessee
Newman's Theory of Health

Carol Diane Epstein, PhD, RN, FCCM
Associate Professor, Director, Combined Degree Program, Pleasantville Lienhard School of Nursing, Pace University, Pleasantville, New York
Critical Care Nursing Research

W. Scott Erdley, DNS, RN
Special Projects Simulation Educational Specialist, Behling Simulation Center, University at Buffalo Academic Health Sciences Center, Buffalo, New York
Electronic Network

Lois K. Evans, PhD, RN, FAAN
Van Ameringen Professor in Nursing Excellence, School of Nursing, University of Pennsylvania, Philadelphia, Pennsylvania
Physical Restraints

Deborah B. Fahs, MSN, APRN, CPNP
Lecturer, School of Nursing, Yale University, New Haven, Connecticut
Eating Disorders

Melissa Spezia Faulkner, DSN, RN, FAAN
Gladys E. Sorensen Endowed Professor, Diabetes Research, College of Nursing, University of Arizona, Tucson, Arizona
Diabetes Research

Jacqueline Fawcett, PhD, FAAN
Professor and Nursing Department Chairperson, College of Nursing and Health Sciences, University of Massachusetts, Boston, Massachusetts
Johnson's Behavioral System Model

Suzanne Feetham, PhD, RN, FAAN
Visiting Professor, University of Wisconsin, Milwaukee, Wisconsin, Nursing Research Consultant, Children's National Medical Center, Washington, DC
Family Health

Kathleen Fentress, BS
Graduate Student, School of Nursing, Yale University, New Haven, Connecticut
Schizophrenia

Donna M. Fick, PhD, GCNS-BC, FGSA, FAAN
School of Nursing, Pennsylvania State University, University Park, Pennsylvania
Ageism

Ellen Fineout-Overholt, PhD, RN, FNAP, FAAN
Director, Center for Advancement of Evidence-based Practice, Arizona State University College of Nursing and Health Innovation, Phoenix, Arizona
Evidence-Based Practice

Mary L. Fisher, PhD, RN, CNAA, BC
Associate Professor, School of Nursing, Indiana University, Indianapolis, Indiana
Cost Analysis of Nursing Care

Jane Flanagan, PhD, ANP-BC
Assistant Professor, William F. Connell School of Nursing, Boston College, Chestnut Hill, Massachusetts, Nurse Scientist, Yvonne L. Munn Center for Nursing Research, Massachusetts General Hospital, Boston, Massachusetts
Functional Health Patterns, Nursing Practice Models

Marquis D. Foreman, PhD, RN, FAAN
Professor Emeritus, College of Nursing, University of Chicago at Illinois, Chicago, Illinois
Delirium

Emily Fox-Hill, PhD, RN
Assistant Professor, College of Nursing, University of Tennessee Health Science Center, Memphis, Tennessee
Newman's Theory of Health

Maureen A. Frey, PhD, RN
Director of Research and Advanced Practice Children's Hospital of Michigan, Detroit, Michigan
King's Conceptual System and Theory of Goal Attainment

Sara T. Fry, PhD, RN, FAAN
Henry R. Luce Professor of Nursing Ethics School of Nursing, Boston College, Chestnut Hill, Massachusetts
Rights of Human Subjects

Terry Fulmer, PhD, RN, FAAN
The Erline Perkins McGriff Professor and Dean, College of Nursing, New York University, New York, New York
Acute Care of the Elderly, Elder Mistreatment

Carol D. Gaskamp, PhD, RN, CNE
Assistant Professor of Clinical Nursing, Division Chair, Family, Public Health Nursing, and Nursing Administration Division, School of Nursing, University of Texas at Austin, Austin, Texas
Spirituality

Marion Good, PhD, RN, FAAN
Professor Emerita, Frances Payne Bolton School of Nursing, Case Western Reserve University, Cleveland, Ohio
Music Therapy, Pain

Patricia A. Grady, PhD, RN, FAAN
Director, National Institute of Nursing Research, National Institutes of Health, Bethesda, Maryland
Acute Care of the Elderly, National Institute of Nursing Research

Judith R. Graves, PhD, RN, FAAN
Professor, College of Nursing, University of Utah, Salt Lake City, Utah
Secondary Data Analysis

Bobbe Ann Gray, PhD, RNC-OB, CNS-BC
Associate Professor, Director, Doctor of Nursing Practice Program, College of Nursing and Health, Wright State University, Dayton, Ohio
Childbirth Education

Mary T. Quinn Griffin, PhD, RN
Assistant Professor of Nursing, Frances Payne Bolton School of Nursing, Case Western Reserve University, Cleveland, Ohio
Health Conceptualization, Institutional Review Board and Informed Consent, Parse's Humanbecoming School of Thought, Roy Adaptation Model

Hurdis M. Griffith, PhD, RN, FAAN
Professor and Dean Emeritus, College of Nursing, Rutgers University, Newark, New Jersey
Current Procedural Terminology–Coded Services

Deborah Gross, DNSc, RN, FAAN
Leonard and Helen Stulman Professor in Mental Health and Psychiatric Nursing, School of Nursing and School of Medicine, Department of Psychiatry and Behavioral Sciences, Johns Hopkins University, Baltimore, Maryland
Mother–Infant/Toddler Relationships

Sarah H. Gueldner
Frances Payne Bolton School of Nursing, Case Western Reserve University, Cleveland, Ohio
Osteoporosis

Barbara J. Guthrie, PhD, RN, FAAN
Associate Professor, Associate Dean for Academic Affairs, School of Nursing, Yale University, New Haven, Connecticut
Eating Disorders

Barbara K. Haight, RNC, DRPH, FAAN
Professor Emeritus, College of Nursing, Medical University of South Carolina, Charleston, South Carolina
Reminiscence

Kimberly B. Hall, MSN, RN, NE-BC
Assistant Professor, Department of Nursing, Jefferson College of Health Sciences, Roanoke, Virginia
Stress, Stress Management

Edward J. Halloran, PhD, RN, FAAN
Associate Professor, School of Nursing, University of North Carolina–Chapel Hill, Chapel Hill, North Carolina
Henderson's Model

Emily J. Hauenstein, PhD, LCP, MSN, RN
Thomas A. Saunders III, Family Professor and Director, Southeastern Rural Mental Health Research Center, School of Nursing, University of Virginia, Charlottesville, Virginia
Depression in Women

Laura L. Hayman, PhD, RN, FAAN
Associate Dean for Research, Professor of Nursing, College of Nursing and Health Sciences, University of Massachusetts Boston, Director of Research, GoKids Boston, Boston, Massachusetts
Cardiovascular Risk Factors: Cholesterol, Nutrition in Infancy and Childhood

Josephine Hegarty, PhD, MSc, RNT, BSc, RGN
Associate Professor, Director of Undergraduate Education, Catherine McAuley School of Nursing and Midwifery, Brookfield Health Sciences Complex, University College Cork, Cork, Ireland
Cochrane Review

Patricia A. Higgins, RN, PhD
Associate Professor, Case Western Reserve University, Researcher, Cleveland VAMC Geriatric Research Education and Clinical Center, Cleveland, Ohio
Failure to Thrive (Adult)

Martha N. Hill, RN, PhD
Department of Health Systems and Outcomes, School of Nursing, Johns Hopkins University, Baltimore, Maryland
Hypertension

Mary Angelique Hill, DNP, RN, CPN
Professor of Nursing, Florida Gateway College, Lake City, Florida
Boykin and Schoenhofer: The Theory of Nursing as Caring

Cheryl R. Dennison Himmelfarb, RN, ANP, PhD
Associate Professor, Department of Health Systems and Outcomes, School of Nursing, Division of Health Sciences Informatics, School of Medicine, Johns Hopkins University, Baltimore, Maryland
Hypertension

Marilyn Hockenberry, PhD, RN-CS, PNP, FAAN
Professor of Pediatrics, Department of Hematology-Oncology, Baylor College of Medicine, Nurse Scientist, Director, Center for Nursing Research, Texas Children's Hospital, Houston, Texas
Cancer in Children

Diane Holditch-Davis, PhD, RN, FAAN
Marcus Hobbs Distinguished Professor of Nursing, Associate Dean for Research Affairs, School of Nursing, Duke University, Durham, North Carolina
Neurobehavioral Development, Parenting Research in Nursing

Cheryl Holly, EdD, RN
Associate Professor and Chair, Capacity Building Systems, Director, DNP Program, Co-Director, New Jersey Center for Evidence Based Practice, Joanna Briggs Institute Collaborating Center, School of Nursing, University of Medicine and Dentistry of New Jersey, Newark, New Jersey
Systematic Review

Barbara J. Holtzclaw, PhD, RN, FAAN
Nurse Scientist, Professor, Associate Director, Geriatric Nursing Translational Research Training, Donald W. Reynolds Center of Geriatric Nursing Excellence, College of Nursing and Graduate College, University of Oklahoma Health Sciences Center, Oklahoma City, Oklahoma, Professor Emeritus, School of Nursing, University of Texas Health Science Center at San Antonio, San Antonio Texas
Fever/Febrile Response, Shivering, Thermal Balance

June Andrews Horowitz, RN, PhD, FAAN
Professor, William F. Connell School of Nursing, Boston College, Chestnut Hill, Massachusetts
Postpartum Depression

Ann C. Hurley, RN, DNSc, FAANA
Senior Nurse Scientist Emerita, Center for Nursing Excellence, Brigham and Women's Hospital, Boston, Massachusetts
Mental Status Measurement: Mini-Mental State Examination

Sally A. Hutchinson, PhD, RN, FAAN
Professor, University of Florida College of Nursing Jacksonville, Florida
Grounded Theory, Research Interviews (Qualitative)

Kathleen Huttlinger, PhD
Professor, Associate Director for Graduate Programs, School of Nursing, College of Health and Social Services, New Mexico State University, Las Cruces, New Mexico
Content Analysis, Exploratory Studies, Participant Observation

Gail L. Ingersoll, EdD, RN, FAAN
Professor and Associate Dean for Research, University of Rochester School of Nursing Rochester, New York
Evaluation

Pamela M. Ironside, PhD, RN, FAAN, ANEF
Associate Professor, Director of the Center for Research in Nursing Education, School of Nursing, Indiana University, Indianapolis, Indiana
Hermeneutics

Sharol F. Jacobson, PhD, RN, FAAN
Associate Dean for Research and Practice, Professor, University of Alabama School of Nursing, Tuscaloosa, AL
Cultural/Transcultural Focus

Connie A. Jastremski, RN, MS, MBA, FCCM
Chief Nursing Officer and VP Patient Care Services, Bassett Healthcare, Cooperstown, New York
Patient Care Delivery Models

Amy R. Johnson, MAT, MA, LLPC, TLS, CPDT-KA
Special Projects Coordinator, School of Nursing, Oakland University, Rochester, Michigan
Pet Therapy

Kathy A. Johnson, RN, MSN, PhD Student
School of Nursing, University of Wisconsin, Madison, Wisconsin
Widows and Widowers

Joyce Johnston MBA, RN
Practice Manager, Hospitalist Department, Carilion Clinic, Roanoke, Virginia
Wellness

Dorothy A. Jones, EdD, RN, FAAN
Professor, William F. Connell School of Nursing, Boston College, Chestnut Hill, Massachusetts, Director, Yvonne L. Munn Center for Nursing Research, Massachusetts General Hospital, Boston, Massachusetts
Functional Health Patterns, Nursing Practice Models

Jeffrey Schwab Jones, DNP, PMHCNS-BC, LNC
Board Certified-Psychiatric Clinical Nurse Specialist, Legal Nurse Consultant, Pinnacle Mental Health Associates, Inc, Mansfield, Ohio
Interpersonal Communication: Nurse–Patient

Josette Jones, RN, PhD
Assistant Professor, School of Informatics–School of Nursing, Indiana University, Indianapolis, Indiana
Telehealth, Telenursing/Telepractice, Telepresence

Alyson Karakouzian, BSNc
Student, College of Nursing and Health Sciences, University of Massachusetts Boston, Boston, Massachusetts
Nutrition in Infancy and Childhood

Maureen Keckeisen, RN, MN, CCRN
Clinical Nurse Specialist, Liver Transplant/Surgical Specialties ICU, University of Los Angeles Health System, Los Angeles, California
Hemodynamic Monitoring

Lisa Skemp Kelley
Associate Professor, College of Nursing, University of Iowa, Iowa City, Iowa
Qualitative Research

Susan J. Kelley, PhD
Dean and Professor, College of Health and Human Sciences, Georgia State University, Atlanta, Georgia
Grandparents Raising Grandchildren

Alice Kempe, PhD, CS
Associate Professor, Ursuline College, Pepper Pike, Ohio
Family Caregiving and the Seriously Mentally Ill

Vicki Keough, PhD, RN, ACNP
Dean, School of Nursing, Loyola University Chicago, Chicago, Illinois
Emergency Nursing

Mary E. Kerr, PhD, RN
Deputy Director, National Institute of Nursing Research, National Institutes of Health, Bethesda Maryland
Cerebral Ischemia

Shaké Ketefian, EdD, RN, FAAN
Professor Emerita, Office of International Affairs, School of Nursing, University of Michigan, Ann Arbor, Michigan
Research in Nursing Ethics

Hesook Suzie Kim, RN, PhD
Professor Emerita, College of Nursing, University of Rhode Island, Kingston, Rhode Island
Action Science, Discourse Analysis, Narrative Analysis

Tae Youn Kim, PhD, RN
Assistant Professor, College of Nursing, University of Wisconsin–Milwaukee, Milwaukee, Wisconsin
International Classification for Nursing Practice

Kenn M. Kirksey, RN, MSN, PhD, ACNS-BC
Director, The Center for Nursing Research, SETON Family of Hospitals, Austin, Texas
HIV Symptom Management and Quality of Life

Chiemi Kochinda, PhD, RN
Assistant Professor, School of Nursing, University of Kansas, Kansas City, Kansas
Instrument Translation

Katharine Kolcaba, RN, PhD
Associate Professor (Emeritus), The University of Akron, Akron, Ohio, Owner/Consultant, The Comfort Line, Chagrin Falls, Ohio
Comfort Theory

Heidi V. Krowchuk, RN, PhD, FAAN
Associate Professor, School of Nursing, The University of North Carolina at Greensboro, Greensboro, North Carolina
Child–Lead Exposure Effects, Failure to Thrive (Child)

Marjorie Thomas Lawson, PhD, APRN, BC, FNP
Associate Professor and Graduate Coordinator, Maine College of Nursing and Health Professions, University of Southern, Portland, Maine
Interpersonal Communication: Nurse–Patient

Mark Lazenby, PhD, RN
Lecturer, School of Nursing, Yale University, New Haven, Connecticut
Chronic Illness

Regina Placzek Lederman, RN, BSN, MNEd, MA, PhD
Professor, Division of Sociomedical Sciences, Department of Preventive Medicine and Community Health, University of Texas at Galveston, School of Nursing, Galveston, Texas
Maternal Anxiety and Psychosocial Adaptation During Normal and High-Risk Pregnancy

Yi-Hui Lee, PhD, RN
Assistant Professor, College of Nursing and Health, Wright State University, Dayton, Ohio
Depression and Cardiovascular Diseases, HIV Risk Behavior

Elizabeth R. Lenz, PhD, RN, FAAN
Dean and Professor, College of Nursing, Ohio State University, Columbus, Ohio
Doctoral Education

Eugene Levine, PhD
Professor Emeritus Uniformed Services, Graduate School of Nursing, University of the Health Sciences, Bethesda, Maryland
Quantitative Research

Wendy Lewandowski, PhD, PMHCNS-BC
Associate Professor, Director, PMHN Graduate Program, College of Nursing, Kent State University, Kent, Ohio
Community Mental Health

Irene Daniels Lewis, DNS, APN, FAAN
Professor, College of Applied Sciences and Arts, San Jose State University, School of Nursing, San Jose, California
Ethnogeriatrics

Judith A. Lewis, PhD, RN, WHNP-BC, FAAN
Professor Emerita, School of Nursing, Virginia Commonwealth University, Richmond, Virginia
Genetics

Suling Li, PhD, RN
Director, Institute for Emergency Nursing Research, Emergency Nurses Association, Burr Ride, Illinois
Emergency Nursing

Patricia Liehr, PhD, RN
Christine F. Lynn College of Nursing, Florida Atlantic University, Boca Raton, Florida
Middle-Range Theories, Story Theory

Deborah F. Lindell, ND, APRN, BC
Assistant Professor of Nursing, Case Western Reserve University, Frances Payne Bolton, School of Nursing, Cleveland, Ohio
Grounded Theory

Adrianne D. Linton, PhD, RN, FAAN
Chair and Professor, Department of Family and Community Health Systems, School of Nursing, University of Texas Health Science Center at San Antonio, San Antonio, Texas
Wandering

Terri H. Lipman, PhD, CRNP, FAAN
Miriam Stirl Endowed Term Professor of Nutrition, Professor of Nursing of Children, School of Nursing, University of Pennsylvania, Philadelphia, Pennsylvania
Clinical Decision Making

Jane Lipscomb, PhD, RN, FAAN
Professor and Director, Work and Health Research Center, School of Nursing, University of Maryland, Baltimore, Maryland
Workplace Violence

Robert Lucero, PhD, MPH, RN
Assistant Professor of Nursing, Center for Health Policy, School of Nursing, Columbia University, New York, New York
Patient Safety

Stacie Salsbury Lyons, PhD, RN
Palmer Center for Chiropractic Research, Davenport, Iowa
Ethnography

Karen MacDonald, PhD, RN
Chief Executive, Matrix45, Earlysville, Virginia
Applied Research, Experimental Research, Quasi-Experimental Research

Ellen K. Mahoney, RN, DNS, FGSA
Associate Professor and Department Chair, William F. Connell School of Nursing, Boston College, Chestnut Hill, Massachusetts
Mental Status Measurement: Mini-Mental State Examination

Judith A. Maloni, PhD, RN
Professor, Frances Payne Bolton School of Nursing, Case Western Reserve University, Cleveland, Ohio
Prevention of Preterm Birth, Preterm Labor, and Low Birth Weight

Linda Manfrin-Ledet, DNS, APRN, BC
Associate Professor of Nursing, Nicholls State University, Thibodaux, Louisiana
Violence

Marie Manthey, MNA, (h) PhD
President Emeritus, Creative Healthcare Management, Minneapolis, Minnesota
Primary Nursing

Patricia A. Martin, PhD, RN
Dean and Professor, College of Nursing and Health, Wright State University, Dayton, Ohio
Research Dissemination

Marianne Matzo, PhD, GNP-BC, FPCN, FAAN
Professor and Frances E. and A. Earl Ziegler Chair in Palliative Care Nursing, Sooner Palliative Care Institute: Dedicated to Excellence in Palliative Care Education, Research, and Practice, Adjunct Professor, Department of Geriatric Medicine, College of Nursing, University of Oklahoma, Oklahoma City, Oklahoma
Palliative Care

Linda J. Mayberry, RN, PhD, FAAN
Associate Adjunct Professor, New York University, New York City, New York
Postpartum Depression

Angela Barron McBride, PhD, RN, FAAN
Distinguished Professor and University Dean Emerita, School of Nursing, Indiana University, Indianapolis, Indiana
Women's Health

Melen R. McBride, PhD, RN, FGSA
Associate Director, Stanford Geriatric Education Center, School of Nursing, Stanford University, Manhattan Beach, California
Ethnogeriatrics

Geraldine McCarthy, PhD, MSN, MEd, DNS, RGN, RNT
Dean and Professor, Catherine McCauley School of Nursing and Midwifery, University College Cork, Cork, Ireland
Mild Cognitive Impairment

Ruth McCorkle, PhD, FAAN
Florence Wald Prof Nursing and Epidemiology and Public Health, School of Nursing, Yale University, New Haven, Connecticut
Chronic Illness

Susan H. McCrone, PhD, RN, PMHCHS-BC
Professor and Chair, Health Promotion/Risk Reduction Department, School of Nursing, West Virginia University, Morgantown, West Virginia
Coronary Artery Bypass Graft Surgery

Graham J. McDougall Jr., RN, PhD, FAAN, FGSA
Professor, School of Nursing, University of Texas at Austin, Austin, Texas
Alzheimer's Disease

Gayle McGlory, PhD, RN-BC
Clinical Nursing Educator II, Medical Surgical and Critical Care Services, Harris County Hospital District, Lyndon B. Johnson General Hospital, Houston, Texas
HIV Symptom Management and Quality of Life

Gretchen A. McNally, PhD, ANP-BC
Nurse Practitioner–Hematology, Dr. John Byrd and Dr. Joseph Flynn, Arthur G. James Cancer Hospital, Ohio State University, Columbus, Ohio
Smoking Cessation

Mary J. McNamee, PhD, RN
Director, Office of Student Equity and Multicultural Affairs, Assistant Vice Chancellor for Academic Affairs, University of Nebraska Medical Center, Omaha, Nebraska
Homeless Health

Barbara Medoff-Cooper, PhD, RN, FAAN
Ruth M. Colket Professor of Pediatric Nursing, Director, Biobehavioral Research Center, School of Nursing, University of Pennsylvania, Philadelphia, Pennsylvania
Neurobehavioral Development

Paula M. Meek, PhD, RN, FAAN
Professor, Senior Scholar, Division Chair Adult and Senior Health, Health Science Center, College of Nursing, University of Colorado Denver, Aurora, Colorado
Instrumentation, Reliability, Validity

Janet C. Meininger, PhD, FAAN
Lee and Joseph D. Jamail Distinguished Professor, School of Nursing, Professor, School of Public Health, University of Texas Health Science Center at Houston, Houston, Texas
Observational Research Design

Afaf Ibrahim Meleis
Margaret Bon Simon Dean of Nursing, School of Nursing, University of Pennsylvania, Philadelphia, Pennsylvania
Immigrant Women, International Nursing Research, Transitions and Health

Bernadette Melnyk, PhD, RN, CPNP/PMHNP, FNAP, FAAN
Dean and Distinguished Foundation Professor in Nursing, College of Nursing and Health Innovation, Arizona State University, Phoenix, Arizona
Evidence-Based Practice

Victoria Menzies, PhD, RN
Center for the Study of Complementary and Alternative Therapies, School of Nursing, University of Virginia, Charlottesville, Virginia
Complementary and Alternative Practices and Products

Martha G. Meraviglia RN, CNS, PhD
Associate Professor of Clinical Nursing, School of Nursing, University of Texas at Austin, Austin, Texas
Spirituality

DeAnne K. Hilfinger Messias, PhD, RN, FAAN
College of Nursing and Women's and Gender Studies, School of Nursing, University of South Carolina, Columbia, South Carolina
Immigrant Women

Bonnie L. Metzger, PhD, RN, FAAN
Professor Emerita, School of Nursing, University of Michigan, Ann Arbor, Michigan
Time Series Analysis

Raquel M. Meyer, PhD, RN
Assistant Professor (CLTA), Lawrence S. Bloomberg, Faculty of Nursing, University of Toronto, Toronto, Ontario, Canada
Nurse Staffing, Organizational Culture, Organizational Design

Margaret Shandor Miles, PhD, RN, FAAN
Professor, School of Nursing, University of North Carolina, Chapel Hill, North Carolina
Parenting Research in Nursing

Nancy Houston Miller, RN, BSN
Associate Director, Stanford Cardiac Rehabilitation Program, Palo Alto, California
Smoking/Tobacco as a Cardiovascular Risk Factor

Peggy A. Miller, RN, PhD
Research Assistant Professor, University of Kansas Medical Center, Kansas City, Kansas
Job Satisfaction

Susan M. Miovech, PhD, RNC-OB
Associate Professor (Retired), Holy Family University, Philadelphia, Pennsylvania
Fetal Monitoring

Merle H. Mishel, PhD, FAAN
Kenan Professor of Nursing and Director, Doctoral and Postdoctoral Programs, School of Nursing, University of North Carolina, Chapel Hill, North Carolina
Uncertainty in Illness

Ethel L. Mitty, EdD, RN
Adjunct Clinical Professor of Nursing, College of Nursing, New York University, New York, New York
End-of-Life Planning and Choices, Unlicensed Assistive Personnel

Mary Moller, DNP, ARNP, APRN, PMHCNS-BC, CPRP, FAAN
Associate Professor, Specialty Director–Psychiatric Mental Health Nursing, School of Nursing, Yale University, New Haven, Connecticut
Schizophrenia

Kristen S. Montgomery, PhD, RN
Assistant Professor, University of North Carolina at Charlotte, Charlotte, North Carolina
Fitzpatrick's Rhythm Model, Pregnancy, Watson's Theory of Human Caring

Shirley M. Moore, PhD, RN, FAAN
Professor and Associate Dean for Research, Frances Payne Bolton School of Nursing, Case Western Reserve University, Cleveland, Ohio
Theoretical Framework

Sue Moorhead, PhD, RN
Associate Professor and Director for the Center for Nursing Classification and Clinical Effectiveness, College of Nursing, The University of Iowa, Iowa City, Iowa
Nursing Diagnoses, Interventions, and Outcomes: NANDA-I, Nursing Interventions Classification, and Nursing Outcomes Classification

Diana Lynn Morris, PhD, RN, FAAN
Associate Professor Case Western Reserve, School of Nursing, University Frances Payne Bolton, Cleveland, Ohio
Watson's Theory of Human Caring

Barbara Munro, PhD, RN, FAAN
Professor, School of Nursing, Boston College, Chestnut Hill, Massachusetts
Data Management, Statistical Techniques

Carol M. Musil, PhD, RN
Professor Case Western Reserve, School of Nursing, University Frances Payne Bolton, Cleveland, Ohio
Cohort Design, Pilot Study

Madeline A. Naegle, APRN, BC, PhD, FAAN
Professor and Coordinator, Advanced Practice Nursing: Psychiatric-mental Health, Director, College of Nursing, New York University, International Programs Director, WHO Collaborating Center for Geriatric Nursing Education, New York University, New York City, New York
Substance Use Disorders in Registered Nurses

Alvita Nathaniel, PhD, FNP-BC, FAANP
Associate Professor, Coordinator Family Nurse Practitioner Track, School of Nursing, West Virginia University, Charleston, West Virginia
Moral Distress, Moral Reckoning

Mary D. Naylor, PhD, RN, FAAN
Director, New Courtland Center for Transitions and Health, School of Nursing, University of Pennsylvania, Philadelphia, Pennsylvania
Transitional Care

Leslie Neal-Boylan, PhD, CRRN, APRN-BC, FNP
Professor, Graduate Program Director, School of Nursing, Southern Connecticut State University, New Haven, Connecticut
Home Health Systems

M. Janice Nelson, PhD, RN
Retired Dean and Professor Emeritus, Upstate Medical University, College of Nursing, Syracuse, New York
Patient Care Delivery Models

Kathleen M. Nokes, PhD, RN, FAAN
Professor and Director of the Graduate Nursing Program, Hunter-Bellevue School of Nursing, Hunter College, City University of New York, Stone Ridge, New York
HIV/AIDS Care and Treatment

Jeanne Marie Novotny, PhD, RN, FAAN
Dean and Professor, School of Nursing, Fairfield University, Fairfield, Connecticut
Nursing Education

Adey Nyamathi, ANP, PhD, FAAN
Professor and Associate Dean for International Research and Scholarly Activities, Acting Associate Dean for Research, Audrienne H. Moseley Endowed Chair in Community Health Research, Director of the NINR-funded Ruth, School of Nursing, University of California, Los Angeles, California
Health Disparities: Theoretical and Methodological Approaches

Cassandra Okechukwu, ScD, MSN
Assistant Professor of Society, Human Development and Health, Harvard School of Public Health, Boston, Massachusetts
Workplace Violence

Patti Hart O'Regan, DNP, ARNP, ANP-C, PMHNP-BC, LMHC
Board Certified Nurse Practitioner, Adult Primary Care and Psychiatry, President and CEO, Village Health LLC, Port Richey, Florida
Quality of Care

Beth Palmer, DNP, ACNS-BC, ANP-BC
Nurse Practitioner, VA San Diego Healthcare System, San Diego, California
Nurse Engagement

Sarah Pernikoff, BA
Undergraduate Nursing Student, College of Nursing, New York University, New York, New York
Acute Care of the Elderly, Elder Mistreatment

John Phillips, PhD, RN
Professor Emeritus, School of Education, New York University, New York, New York
Rogers' Science of Unitary Persons

Linda R. Phillips, PhD, RN, FAAN
Professor and Audrienne H. Moseley Endowed Chair in Nursing, University of California, Los Angeles, California
Clinical Nursing Research

Sally Phillips RN, PhD
Director Public Health Emergency Preparedness Program, Agency for Health Care Research and Quality, Rockville, Maryland
Caring, Nursing Process

Ubolrat Piamjariyakul, PhD, RN
Research Associate Professor, School of Nursing, University of Kansas, Kansas City, Kansas
Caregiver, Nurse-Led Group Clinic Visits

Denise F. Polit, FAAN
Professor, School of Nursing, Griffith University, Gold Coast, Australia, President, Humanalysis, Inc., Saratoga Springs, New York
Data Collection Methods

Sue A. Popkess-Vawter, PhD, RN
Professor, University of Kansas, School of Nursing, Kansas City, Kansas
Weight Management

Demetrius J. Porche, DNS, PhD, APRN-FNP, FAANP, FAAN
Dean and Professor, Health Sciences Center, School of Nursing, Louisiana State University, New Orleans, Louisiana
Violence

Eileen J. Porter, PhD, RN, FGSA
Professor, School of Nursing, University of Wisconsin–Madison, Madison, Wisconsin
Widows and Widowers

Diane Shea Pravikoff, RN, PhD, FAAN
Director of Research/Professional Liaison, CINAHL Information Systems, Glendale, California
CINAHL® Database

Tara C. Prescott, DNP, RN
Quality Division, Exeter Hospital, Exeter, New Hampshire
Nurse and Physician Interdisciplinary Collaboration

Jana L. Pressler, PhD, RN
Professor and PhD Program Director and DNP Project Director, University of Oklahoma Health Sciences Center, Oklahoma City, Oklahoma
Fitzpatrick's Rhythm Model

Pamela G. Reed, PhD, RN, FAAN
Professor, College of Nursing, University of Arizona, Tucson, Arizona
Peplau's Theoretical Model

K. M. Reeder, PhD, RN
Senior Research Associate, School of Nursing, University of Kansas, Kansas City, Kansas
Quality of Life

Sally Reel, PhD, RN
Clinical Professor and Associate Dean for Practice, College of Nursing, University of Arizona, Tucson, Arizona
Comparative Effectiveness Research

Barbara Resnick, PhD, CRNP, FAAN, FAANP
Professor and Chairperson, University of Maryland, School of Nursing, Baltimore, Maryland
Continuing Care Retirement Communities, Self-Efficacy

Brandon N. Respress, PhD, RN, MSN, MPH, CPNP
Research Fellow, Health Promotion/Risk Reduction Interventions with Vulnerable Populations, School of Nursing, University of Michigan, Ann Arbor, Michigan
Health Disparities in Racial and Ethnic Minorities

Jimmy Reyes, DNP, MSN, RN
Project Director, College of Nursing, University of Iowa, Iowa City, Iowa
Ethnography

Virginia Richardson, PhD, RN, CPNP, FAANP
Associate Professor, School of Nursing, Indiana University, Indianapolis, Indiana
Pediatric Primary Care

Beverly L. Roberts, PhD, FAAN, FGSA
Annabel Davis Jenks Professor of Nursing, School of Nursing, University of Florida, Gainesville, Florida
Falls

Karen R. Robinson, PhD, RN, FAAN
Associate Director for Clinical Operations, Department of Veterans Affairs Medical Center Fargo, North Dakota
Current Procedural Terminology–Coded Services

Cheryl Rodgers, PhD, CPNP, CPON
Clinical Instructor, Department of Pediatrics, Baylor College of Medicine, Pediatric Nurse Practitioner, Texas Children's Cancer Center, Houston, Texas
Cancer in Children

Bonnie Rogers, DrPH, COHN-S, LNCC
Director, NC Occupational Safety and Health and Education and Research Center and OHN Program, School of Public Health, University of North Carolina, Chapel Hill, North Carolina
Nursing Occupational Injury and Stress

Carol A. Romano, PhD, RN, BC, NEA, FAAN, FACMI
Associate Dean for Academic Affairs and Professor, Graduate School of Nursing, Uniformed Services University of the Health Sciences, Bethesda, Maryland
Data Stewardship

Eileen Virginia Romeo, MSN, RN
Doctoral Student, Case Western Reserve, School of Nursing, University Frances Payne Bolton, Cleveland, Ohio
Orem's Self-Care Theory

Linda Rose, RN, PhD
Associate Professor, School of Nursing, Johns Hopkins University, Baltimore, Maryland
Serious Mental Illness

Virginia K. Saba, EdD, RN, FAAN, FACMI
Distinguished Scholar, Adjunct, Georgetown University, Washington, DC, CEO and President, SabaCare Inc., Arlington, Virginia
Clinical Care Classification System, Nursing Information Systems

Ali Salman, PhD, RN
Visiting Assistant Professor, School of Nursing, Oakland University, Rochester, Michigan
Depression and Cardiovascular Diseases, HIV Risk Behavior

Laura J. Samuel, FNP, MSN
School of Nursing, Johns Hopkins University, Baltimore, Maryland
Hypertension

Eileen Savage, PhD, MEd, BNS, RCN, RGN
Professor of Nursing, School of Nursing and Midwifery, University College Cork, Cork, Ireland
Cochrane Review

Elizabeth A. Schlenk, PhD, RN
Assistant Professor, School of Nursing, University of Pittsburgh, Pittsburgh, Pennsylvania
Patient Contracting

Karen L. Schumacher, RN, PhD
Associate Professor, College of Nursing, University of Nebraska, Omaha, Nebraska
Transitions and Health

Joan L. Shaver, PhD, RN, FAAN
Professor and Dean, College of Nursing, University of Arizona, Tucson, Arizona
Sleep Science

Nelma B. C. Shearer, PhD, RN
Associate Professor and Codirector, Hartford Center of Geriatric Nursing Excellence, College of Nursing and Health Innovation, Arizona State University, Phoenix, Arizona
Peplau's Theoretical Model

Caryn A. Sheehan, DNP, APRN-BC
Associate Professor, School of Nursing, Saint Anselm College, Manchester, New Hampshire
Pender's Health Promotion Model

Deborah Shelton, PhD, RN, NE-BC, CCHP, FAAN
Professor, School of Nursing/Department of Medicine, Director, Research and Evaluation–Correctional Managed Health Care, University of Connecticut, Storrs, Connecticut
Child Delinquents

Elaine K. Shimono, MA, RN
Clinical Director Psychiatry Care Center, Mount Sinai Medical Center, New York, New York
Rogers' Science of Unitary Persons

Mary Cipriano Silva, PhD, RN, FAAN
Professor Emeritus, College of Nursing and Health Science, George Mason University, Fairfax, Virginia
Ethics of Research, Philosophy of Nursing

Michael Simon, RN, BSN, MSN
Research Assistant Professor, Manager, Research and Development, National Database of Nursing Quality Indicators (NDNQI), School of Nursing, University of Kansas, Kansas City, Kansas
Outcome Measures

Arlene Smaldone, DNSc, CPNP, CDE
Assistant Professor of Nursing, Center for Health Policy, School of Nursing, Columbia University, New York, New York
Patient Safety

Carol E. Smith, PhD, RN
Professor School of Nursing and Professor of Preventive Medicine and Public Health, School of Nursing, University of Kansas Medical Center, Kansas City, Kansas
Caregiver, Home Care Technologies, Nurse-Led Group Clinic Visits, Virtual Nurse Caring

Marlaine C. Smith, RN, PhD, AHN-BC, FAAN
Associate Dean and Helen K. Persson Eminent Scholar, Christine E. Lynn College of Nursing, Florida Atlantic University, Boca Raton, Florida
Caring

Mary Jane Smith, PhD, RN
Professor and Associate Dean for Graduate Academic Affairs, School of Nursing, West Virginia University, Morganstown, West Virginia
Drinking and Driving Among Adolescents, Middle-Range Theories, Story Theory

Sandra Sojka, PhD, RN
Assistant Professor, Health Systems, Leadership and Policy, Marcella Niehoff School of Nursing, Loyola University Chicago, Maywood, Illinois
Home Health Classification Systems

Bernard Sorofman, PhD
Professor and Chair, Department of Pharmacy Practice and Science, Executive Associate Dean, College of Pharmacy, University of Iowa, Iowa City, Iowa
Ethnography

Susan M. Sparks, PhD, RN, FAAN
Retired Project Officer, National Library of Medicine, Bethesda, Maryland
Electronic Network

Ann M. Stalter, PhD, RN
Assistant Professor, College of Nursing and Health, Wright State University, Dayton, Ohio
Vulnerable Populations

Theresa Standing, PhD, RN
Assistant Professor Case Western Reserve, School of Nursing, University Frances Payne Bolton, Cleveland, Ohio
Triangulation

Patricia W. Stone, PhD, FAAN
Professor of Nursing, Director of the Center for Health Policy, School of Nursing, Columbia University, New York, New York
Patient Safety

Ora Lea Strickland, PhD, RN, DSc(Hon.), FAAN
Professor, Nell Hodgson Woodruff School of Nursing, Senior Editor, Journal of Nursing Measurement, Emory University, Atlanta, Georgia
Measurement and Scales

Neville E. Strumpf, PhD, RN, FAAN
Professor, School of Nursing, University of Pennsylvania, Philadelphia, Pennsylvania
Physical Restraints

Sheri Stucke, PhD, RN
Las Vegas Medical Center, Las Vegas, Nevada
Osteoporosis

Hsin-Yi Jean Tang, PhD, ARNP-BC
Assistant Professor, College of Nursing, Seattle University, Seattle, Washington
Biofeedback

Anita J. Tarzian, PhD, RN
Associate Professor, Family and Community Health, School of Nursing, University of Maryland, Program Coordinator, Maryland Health Care Ethics Committee Network; Law and Health Care Program, School of Law, University of Maryland, Baltimore, Maryland
Descriptive Research, Nursing Assessment

Ann Gill Taylor, RN, MS, EdD, FAAN
Betty Norman Norris Professor of Nursing and Director, Center for the Study of Complementary and Alternative Therapies (CSCAT), University of Virginia School of Nursing, Charlottesville, Virginia
Complementary and Alternative Practices and Products

Diana Taylor, RNP, PhD, FAAN
Professor Emerita, UCSF School of Nursing, Director, Research and Evaluation, UCSF Primary Care Initiative, Advancing New Standards in Reproductive Health Program (ANSIRH), UCSF Bixby Center for Global Reproductive Health, Oakland, California
Menopause

Debera Jane Thomas, DNS, RN, FNP/ANP
Dean and Professor, School of Nursing, Northern Arizona University, Flagstaff, Arizona
Case Study as a Method of Research

Agnes Tiwari, PhD, RN, FAAN
Associate Professor and Director of Graduate Programs, Assistant Dean (Education), Li Ka Shing Faculty of Medicine, School of Nursing, University of Hong Kong, Hong Kong, China
Domestic Violence

Toni Tripp-Reimer, DNP, MSN, RN
College of Nursing, The University of Iowa, Iowa City, Iowa
Ethnography, Qualitative Research

Susan Tullai-McGuinness, PhD, RN
Associate Professor, Frances Payne Bolton School of Nursing, Case Western Reserve University, Cleveland, Ohio
Health Policy and Health Service Delivery, Health Services Research

Mark P. Tyrrell, MEd, BNS, RGN, RPN, RNT
Lecturer, Catherine McCauley School of Nursing and Midwifery, University College Cork, Cork, Ireland
Mild Cognitive Impairment

Barbara Valanis, PhD, FAAN
Adjunct Faculty, School of Nursing, Oregon Health and Science University, Portland, Oregon
Consortial Research

Janet H. Van Cleave, MSN, PhD
NRSA Postdoctoral Research Fellow, Individualized Care for At-Risk Older Adults, National Institute of Nursing Research, Bethesda, Maryland
Transitional Care

Connie Vance, RN, EdD, FAAN
Professor, School of Nursing, The College of New Rochelle, New Rochelle, New York
Mentoring

Patricia E. H. Vermeersch, PhD, GNP-BC
Associate Professor, College of Nursing and Health, Wright State University, Dayton, Ohio
Delirium

Joyce A. Verran, PhD, RN, FAAN
Research Professor, College of Nursing, University of Arizona, Tucson, Arizona
Instrumentation, Reliability, Validity

Antonia M. Villarruel, PhD, FAAN
Associate Dean for Research and Global Affairs, Professor and Nola J. Pender Collegiate Chair, School of Nursing, University of Michigan, Ann Arbor, Michigan
Health Disparities in Racial and Ethnic Minorities

Anna L. D. Villena, PhD, RN, FNP, BC
Assistant Professor of Clinical Nursing, College of Nursing, The Ohio State University, Columbus, Ohio
Mental Health in Public Sector Primary Care, Mental Health Services Research

Ladislav Volicer, MD, PhD
Courtesy Full Professor, School of Aging Studies, University of South Florida, Tampa, Florida
Mental Status Measurement: Mini-Mental State Examination

Patricia Hinton Walker, PhD, RN, FAAN
Vice president for Nursing Policy and Professor, Graduate School of Nursing, University of the Health Sciences, Bethesda, Maryland
Neuman Systems Model

Joanne Warner, PhD, RN
Dean and Professor, University of Portland, Portland, Oregon
Collaborative Research

Marilyn Wegehaupt, MSN, RN
Homeless Shelter Nurse, Visiting Nurses Association, Omaha, Nebraska
Homeless Health

Mary Ellen Wewers, PhD, MPH, RN, FAAN
Professor, College of Public Health, The Ohio State University, Columbus, Ohio
Smoking Cessation

Kathleen M. White, PhD, RN, NEA-BC, FAAN
Associate Professor, School of Nursing, Johns Hopkins University, Baltimore, Maryland
Translational Research

Carolyn A. Williams, RN, PhD, FAAN
Professor, College of Nursing, University of Kentucky, Lexington, Kentucky
Populations and Aggregates

Danny G. Willis, DNS, PMHCNS-BC
Assistant Professor, William F. Connell School of Nursing, Boston College, Chestnut Hill, Massachusetts
Violence

Celia E. Wills, PhD, RN
Grayce M. Sills Professor in Interdisciplinary Behavioral Health Nursing, Associate Professor, College of Nursing, The Ohio State University, Columbus, Ohio
Mental Health in Public Sector Primary Care, Mental Health Services Research

Teresa Wills, MSc, PDipTLHEd, BNS, RM, RGN
College Lecturer, School of Nursing and Midwifery, Brookfield Health Sciences Complex, University College Cork, Cork, Ireland
Obesity

Holly Skodol Wilson, PhD, RN, FAAN
Professor Emeritus, School of Nursing, University of California, San Francisco, San Francisco, California
Grounded Theory, Research Interviews (Qualitative)

Kaye Wilson-Anderson, RN, DNSc
Associate Professor, University of Portland, School of Nursing, Portland, Oregon
Collaborative Research

Chris Winkelman, RN, PhD, CCRN, ACNP
Associate Professor, Frances Payne Bolton School of Nursing, Case Western Reserve University, Cleveland, Ohio
Physiology

Nancy Fugate Woods, PhD, RN, FAAN
Professor, Biobehavioral Nursing, and Dean Emeritus, School of Nursing, University of Washington, Seattle, Washington
Menopause

Staci S. Wuchner, RN, BSN, CCRN
Graduate Student, School of Nursing, Indiana University, Indianapolis, Indiana
Stroke

May L. Wykle, PhD, RN, FAAN, FGSA
Marvin and Ruth Durr Denekas Professor, Dean of Nursing, Frances Payne Bolton School of Nursing, Case Western Reserve University, Cleveland, Ohio
Depression in Older Adults

Andrea M. Yevchak, GCNS-BC, RN
Doctoral Candidate, John A. Hartford Foundation BAGNC Predoctoral Scholar, School of Nursing, Pennsylvania State University, University Park, Pennsylvania
Ageism

JoAnne M. Youngblut, PhD, RN, FAAN
Professor, School of Nursing, Florida International University, Miami, Florida
Causal Modeling, Structural Equation Modeling

Jaclene A. Zauszniewski, PhD, RNC, FAAN
Kate Hanna Harvey Professor in Community Health Nursing, Associate Dean for Doctoral Education, Case Western Reserve University, Cleveland, Ohio
Depression in Older Adults, Factor Analysis, Resourcefulness

Tamara L. Zurakowski, PhD, CRNP
Practice Associate Professor of Nursing, School of Nursing, University of Pennsylvania, Philadelphia, Pennsylvania
Nightingale, Florence

LIST OF ENTRIES

Current Procedural Terminology-Coded Services *Karen R. Robinson and Hurdis M. Griffith*
Data Analysis *Lauren S. Aaronson*
Data Collection Methods *Denise F. Polit*
Data Management *Barbara Munro*
Data Stewardship *Carol A. Romano*
Delirium *Marquis D. Foreman and Patricia E. H. Vermeersch*
Delphi Technique *Alice S. Demi*
Depression and Cardiovascular Diseases *Ali Salman and Yi-Hui Lee*
Depression in Families *Terry A. Badger*
Depression in Older Adults *Jaclene A. Zauszniewski, Abir K. Bekhet, and May L. Wykle*
Depression in Women *Emily J. Hauenstein*
Descriptive Research *Anita J. Tarzian and Marlene Zichi Cohen*
Diabetes Research *Melissa Spezia Faulkner*
Discourse Analysis *Hesook Suzie Kim*
Doctoral Education *Elizabeth R. Lenz*
Domestic Violence *Agnes Tiwari*
Drinking and Driving Among Adolescents *Mary Jane Smith*
Eating Disorders *Deborah B. Fahs and Barbara J. Guthrie*
Elder Mistreatment *Terry Fulmer and Sarah Pernikoff*
Electronic Network *W. Scott Erdley and Susan M. Sparks*
Emergency Nursing *Suling Li and Vicki Keough*
Empathy *Dianna Hutto Douglas*
End-of-Life Planning and Choices *Ethel L. Mitty*
Enteral Tube Placement *Marsha L. Ellett*
Epilepsy *Joan K. Austin*
Ethics of Research *Mary Cipriano Silva*
Ethnogeriatrics *Melen R. McBride and Irene Daniels Lewis*
Ethnography *Toni Tripp-Reimer, Stacie Salsbury Lyons, Bernard Sorofman, and Jimmy Reyes*
Evaluation *Gail L. Ingersoll*
Evidence-Based Practice *Bernadette Mazurek Melnyk and Ellen Fineout-Overholt*
Experimental Research *Ivo Abraham and Karen MacDonald*
Exploratory Studies *Kathleen Huttlinger*
Factor Analysis *Christopher J. Burant and Jaclene A. Zauszniewski*
Failure to Thrive (Adult) *Patricia A. Higgins*
Failure to Thrive (Child) *Heidi V. Krowchuk*
Falls *Beverly L. Roberts*
Family Caregiving and the Seriously Mentally Ill *Alice Kempe*
Family Health *Suzanne Feetham*
Fatigue *Lauren S. Aaronson*
Feminist Research Methodology *Sara L. Campbell*
Fetal Monitoring *Susan M. Miovech*
Fever/Febrile Response *Barbara J. Holtzclaw*
Fitzpatrick's Rhythm Model *Jana L. Pressler and Kristen S. Montgomery*
Formal Nursing Languages *Suzanne Bakken and Jeeyae Choi*
Functional Health Patterns *Dorothy A. Jones and Jane Flanagan*
Genetics *Judith A. Lewis*
Grandparents Raising Grandchildren *Susan J. Kelley*
Grantsmanship *Lauren S. Aaronson*
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A

ACCULTURATION

We are in the midst of an unparalleled rate of international migration particularly in North America and Europe, which are experiencing an unprecedented influx of immigrants coming from Latin America, Asia, Africa, the Middle East, and the Caribbean (Schwartz, Unger, Zamboanga, & Szapocznik, 2010). This phenomenon is shaping history and has resulted in significant multidisciplinary scholarships. There is extensive literature that investigates and explores how this phenomenon impacts the person, the society, and the global community as a whole.

The transformational experience of an individual when moving from a familiar culture or place of birth to a different culture, country, or region is referred to as *acculturation* (Berry, 2003; Schwartz et al., 2010). This process is multidimensional, individualized, dynamic, and interrelated (Berry, 2003; Schwartz et al., 2010). Many scholars cite Berry's (2003) conceptualization of acculturation, which he described to have several interacting phases that include an initial contact, a conflict resolution phase and an adaptation phase. Berry (2003) further categorized adaptation to include assimilation, separation, integration, and marginalization. Assimilation refers to the adoption of the receiving country's culture and relinquishing of one's original culture, integration suggests biculturalism where an individual adopts some behaviors and traits of the receiving country while retaining one's cultural heritage, separation indicates retaining the heritage culture and rejecting the host culture's practices, and marginalization suggests rejection of both the host and heritage cultures (Berry, 2003). These categories suggest that acculturation is influenced by individual and societal factors, particularly those inherent in host countries (Berry, 2003).

The factors that influence global migration are multifactorial. They are commonly described in the literature as push and pull factors (Kingma, 2001). Pull factors are those conditions found in receiving countries that attract migrants to relocate, whereas push factors are those intrinsic and extrinsic conditions that drive individuals to leave their homeland (Kingma, 2001).

The global nursing shortage has been a catalyst for the international mobility of nursing professionals. However, international nurse migration is predominantly unidirectional that has significantly impacted the health care delivery systems of both the host and donor countries (Ea, Quinn Griffin, L'Eplattenier, & Fitzpatrick, 2008). Economically advantaged countries such as the United States, the United Kingdom, and some countries in the Middle East have become magnet destinations for registered nurses coming from economically disadvantaged countries in Asia, Africa, and the Caribbean (Ea et al., 2008). Examples of push and pull factors that influence the migration of nurses include improved employment opportunities and increased professional opportunities overseas, a search for a better quality of life, an inherent personal desire to experience other cultures, and the need to seek a safe working and living conditions (Kingma, 2001).

There are many instruments found in the literature that attempt to measure acculturation. Scholars on acculturation recommend that instruments that take into account the many domains and factors associated with acculturation be used to capture this complex phenomenon instead of using single-item proxy measures, such as length of residency to the receiving county or age at immigration or those instruments that conceptualize acculturation as a unidirectional process (Cabassa, 2003; Schwartz et al., 2010).

The process of acculturation is also associated with periods of stress that has been shown to profoundly impact physical and mental health among immigrants (Alegria et al. 2008; Allen et al., 2008; Choi, Rankin, Stewart, & Oka, 2008; Lasseter & Callister, 2009; Steffen, Smith, Larson, & Butler, 2006; Zemore, 2007). Results of these studies show that higher level of acculturation has been associated with poor health outcomes, also called the *immigrant paradox*, which include increased risk for hypertension, obesity, depression, increased use of alcohol, and smoking (Alegria et al., 2008; Allen et al., 2008; Choi et al., 2008; Lasseter & Callister, 2009; Steffen et al., 2006; Zemore, 2007). However, a major critique of most of these studies is their reliance on the use of single-proxy measures or instruments that conceptualizes acculturation as unidimensional (Schwartz et al., 2010). It is not clear if these outcomes were the result of adopting the receiving country's cultural norms or relinquishing the original culture's practices or both (Schwartz et al., 2010).

There is a growing literature that examines how immigrant nurses adjust to the host country's culture. Most of these studies are conducted in host countries such as the United States and the United Kingdom. Similar to Berry's conceptualization, the process of acculturation among immigrant nurses could also be characterized by several phases of adjustment that are dynamic and individualized (Magnusdottir, 2005; Xu, 2007). Findings of several nursing studies show that those who have adopted some of the host culture's traits, behaviors, and attitudes have increased overall levels of job and life satisfaction (DiCicco-Bloom, 2004; Ea et al., 2008; Magnusdottir, 2005; Xu, 2007).

Global migration has profound effects on the individual, on the community, and to the host and donor countries. As globalization intensifies, there is a critical need to continue to understand this complex experience and to develop valid and reliable instruments that capture the essence of this elusive concept. There is a particular need to continue to explore the impact of acculturation on the overall health and well-being of the immigrant. As the global nursing shortage continues to deepen, there is also a need to further investigate the impact of acculturation to the immigrant nurse using a multimethod approach and how this impacts one's physical and mental health and work-related and other personal-related factors.

Emerson E. Ea

ACTION SCIENCE

Action science is an approach for inquiry initially developed by Chris Argyris and Donald Schön (1974) and expanded by Argyris, Putnam, and Smith (1985), aimed at generating knowledge for and improving individual and organizational learning. Action science has been applied in the field of management, specifically for organizational learning, and in various professional practice fields such as education, nursing, social work, and medicine for individual learning in practice. It is an approach to generate knowledge for practice and to transform practice by engaging practitioners in the process of inquiry through reflection on their own behavioral worlds of practice (Argyris et al., 1985; Schön, 1983). Action science has been further developed by Torbert (1991) as "action inquiry," which is used interchangeably in the literature. Although action science and action research, participatory action research in particular, are viewed by many to be in the same inquiry family within social sciences sharing the notion that the inquiry is oriented to change and in solving practical problems through participation of involved people, action science differs from participatory action research by focusing on the learning models that are at the base for human actions as the locus for producing changes (Argyris & Schön, 1989). In action science, changes in human actions are sought by examining and correcting the fundamental mechanisms and reasons for adhering to certain repertoires of behaviors that result from a closed-up mode of learning.

Putnam (1999) suggested that action science is based on three philosophical premises: (a) human practice involves meaning making, intentionality in action, and normativity from the perspective of human agency; (b) human practice goes on in an interdependent milieu of behavioral norms and institutional politics; and (c) the epistemology of practice calls for the engagement of practitioners in generating knowledge. Action science thus is a method and philosophy for improving practice and generating knowledge. Argyris (1980) further suggested that action science is an interventionist approach in which three prerequisites must be established for the research to ensue: (a) a creation of normative models of rare universes that are free of defensive routines, (b) a theory of intervention that can move practitioners and organizations from the present to a new desirable universe, and (c) a theory of instruction that can be used to teach new skills and create new culture.

Action science holds that actions in professional practice are based on practitioners' theories of action. Theories of action are learned and organized as repertoires of concepts, schemata, and propositions and are the basis on which practitioners' behavioral worlds are created in specific situations of practice. Argyris et al. (1985) identified espoused theories and theories in use as two types of theories of action. Espoused theories of action are the rationale expressed by practitioners as guiding their actions in a situation of practice, whereas theories in use refers to theories that are actually used in practice. Theories in use are only inferable from the actions themselves, and practitioners usually are not aware of or not able to articulate their theories in use except through careful reflection and self-dialogue.

Argyris and Schön (1974) and Argyris et al. (1985) identified Model 1 theories in use as a type that seals practitioners from learning and produces routinization and ineffective practice. Humans act in general to satisfy the governing variables (to be in control, to strive to win, to suppress negative feelings, and to act rationally), representing Model 1 theory in use, which often result in defensiveness, misunderstanding, and self-fulfilling and self-sealing processes (Argyris, 1982; Argyris et al., 1985; Argyris & Schön, 1996). On the other hand, Model 2 theory in use encompasses principles of valid information, free and informed choice in action, and internal commitment. Model 1 theory in use represents single-loop learning, whereas Model 2 theory in use aligns with double-loop learning. Thus, action science aims to change people from single-loop learning of Model 1 to double-loop learning of Model 2 through the processes of reflection and learning engaging both practitioners and researchers for the transformation (Argyris, 1993, 2002; Argyris et al., 1985; Argyris & Schön, 1996). Single-loop learning results in change in actions without revising the governing variables, whereas double-loop learning begins with changing the governing variables, followed by change in the actions.

Knowledge of practitioners' theories in use and espoused theories provides a descriptive understanding about the patterns of inconsistencies between theories in use and espoused theories recalled in actual practice. Through action science, practitioners engaged in Model 2 theories in use produce practice knowledge that informs their approach to practice without routinization or the self-sealing mode. In addition, action science generates knowledge regarding the process involved in self-awareness and the learning of new theories in use through reflective practice and practice design.

Research process in action science calls for the cooperative participation of practitioner and researcher through the phases of description, discovery of theories in use, and intervention. The core process in this inquiry is the cooperative offline reflection (Rudolph, Taylor, & Foldy, 2001). Transcriptions of actual practice by the researcher or narratives of actual practice by the practitioner are analyzed together to describe and inform reflectively the nature of practice and theories in use. Action Design (1996) suggested the use of the ladder of inference as a tool to discover practitioners' modes of thinking and action as revealed in transcripts or narratives. The research process is not oriented to the analysis of action transcripts or narratives by a researcher independent of the practitioner. It involves a postpractice face-to-face discussion (interview) between the researcher and the practitioner. Such sessions are used to get at the reconstructed reasoning of practitioners regarding critical moments of the practice and to provide opportunities for reflection on the thinking and doing that were involved in the practice. Through such sessions, the researcher also acts as an interventionist by engaging the practitioner to move toward new learning.

Nursing practice is a human-to-human service that occurs in the context of health care. Nursing practice occurs within online conditions that are complex not only with respect to clients' problems but also in terms of organizational elements of the health care environment. Nursing practice is not based simply on linear translations of relevant theoretical knowledge that governs the situation of practice but has to be derived and designed from the nurse's knowledge of and responses to the competing and complex demands of the situation (Kim, 2010). In addition, as the action scientists suggest, nursing practice in general as well as particular nursing actions may be entrenched with routinization or frozen within Model 1 theories in use.

The general aim of action science for nursing is then to improve nursing practice by freeing nurses from self-sealing practices and by engaging them in the process of learning and participatory research. An extended model of inquiry based on action science such as critical reflective inquiry (Kim, 1999) can be applied to develop knowledge for improving nursing practice.

Hesook Suzie Kim

ACTIVE SURVEILLANCE FOR PROSTATE CANCER

Active surveillance for early stage prostate cancer is defined as a period of intense monitoring for the purpose of delaying traditional therapy within a timeframe that allows for cure if disease progression is detected. This approach can be offered to men with low or very low risk cancers and may reduce overtreatment of clinically insignificant disease and the subsequent side effects that include urinary incontinence and impotence. Men who select active surveillance are usually monitored every 3 to 6 months by their health care provider. Monitoring may include digital rectal examination, repeat biopsy to evaluate Gleason score, estimate of tumor volume, and prostate-specific antigen (PSA) testing to include PSA density (Dall'Era & Kane, 2008). PSA levels provide the most useful information for monitoring disease progression. However, evidence-based selection criteria, monitoring schedules, and confirmed methods to monitor disease activity have not been established and at this time; therefore, active surveillance protocols remain institution and practitioner specific. Given the lack of an established approach for active surveillance, this management strategy remains underutilized by men in the United States as fewer than 10% of potentially appropriate patients select this option (Large & Eggener, 2009).

Active surveillance has evolved from the concept of watchful waiting, a strategy of periodic monitoring followed by active treatment if and when disease progression leads to troublesome symptoms (Adolfsson, 1995). Historically, watchful waiting was viewed as a strategy for men in their seventies, with concomitant illnesses that prohibited traditional therapy. However, many patients and health care providers viewed this as a do-nothing approach, and few considered it a reasonable strategy for disease management resulting in low rate of adoption (approximately 5%) by men in the United States; this may contribute to the low numbers of men currently in active surveillance. In addition, health care providers may be reluctant to offer this strategy because they are uncertain about how to appropriately manage patients, fear of legal backlash in the event a patient's disease progresses to an advanced stage or dies, and a strongly held belief that cancer should be fought with the best treatments available.

From an economic perspective, the adoption of active surveillance for early stage prostate cancer has the potential to reduce costs, to impact psychosocial outcomes, and to affect quality of life. In an evaluation of cost associated with the diagnosis of prostate cancer, Crawford, Blac, Eaddy, and Kruep (2010) determined that the total cost of monitoring a man's disease to be $24,809 compared with $59,286 for treatment that mostly included surgical intervention to remove the prostate cancer. The direct cost of treating prostate cancer with any type of traditional therapy was five times higher than a course of careful monitoring (Crawford et al., 2010). The findings are mixed with regard to the impact a course of active surveillance has on psychosocial outcomes and quality of life. van den Bergh et al. (2010) reported favorably low levels of anxiety and depression in a sample of 150 Dutch men during their first 9 months of active surveillance. However, Bailey et al. (2009) reported that men between 5 and 8 months of active surveillance experienced moderate levels of illness uncertainty. In a previous study, men with higher levels of illness uncertainty had lower levels of quality of life (Hegarty, Wallace, & Comber, 2008). Quality of life may also be affected by the cost of care associated with a diagnosis of prostate cancer (Gomella, Johannes, & Trabulsi, 2009). However, this relationship has not been confirmed.

In contemporary practice, patient selection remains a significant challenge because we still do not have the ability to accurately determine at the time of diagnosis which patients' disease will remain indolent. However, several clinicians and cancer centers have proposed selection criteria. Warlick, Allaf, and Carter (2006) has refined the identification process to include men who are 65 years and older with T1c stage disease, PSA density less than 0.15 ng/ml/cm^3, and a Gleason grade of 6 or less after adequate biopsy as the safest candidates for active surveillance followed by active treatment. Clinicians at the University of California, San Francisco, have established criteria for men with low-risk prostate cancer as the best candidates for active surveillance. These criteria include Gleason sum of 6 (no tumor grade pattern of 4 or 5), PSA at diagnosis of 10 ng/ml or less and stable, 33% or less positive cores, and 50% or less single-needle core involved with cancer from biopsy, stable repeat PSA, and organ-confined disease determined by ultrasound. This center has enrolled more than 500 men into an active surveillance protocol. To date, approximately one in five of those men have undergone treatment for their disease an average of two to three years after diagnosis (Dall'Era et al., 2008).

The National Comprehensive Cancer Network (2010) has recently updated their guidelines to recommend only active surveillance for men diagnosed with low-risk prostate cancer who have a life expectancy of less than ten years. In addition, they have also defined a group at very low risk and recommend that these men with a life expectancy of less than 20 years only receive active surveillance. These guidelines use life expectancy as an important variable in the active surveillance decision-making discussion. However, for younger men, the question of appropriateness remains open and will require additional data. The hope is to improve selection criteria to include younger men who wish to preserve their quality of life.

Although men undergoing active surveillance may eventually need traditional therapy, the delayed time to treatment leaves quality of life intact and may result in improved treatment in the future. In a recent report, Duffield, Lee, Miyamoto, Carter, and Epstein (2009) found that the 48 men of 470 who opted for treatment within an average timeframe of 2.5 years (range = 1–6 years), 31 (66%) had organ-confined disease, 17 (35%) and 3 (6%) had extraprostatic extension and seminal vesicle involvement, respectively, and 7 (15%) had positive margins at the time of surgery. However, up to 50% of men may opt for care in the absence of disease progression (Klotz, 2005).

There are four large randomized clinical trials that are attempting to determine the benefits of active surveillance for localized prostate cancer. The Prostate Testing for Cancer and Treatment trial has enrolled approximately 109,750 as of 2008 from the United Kingdom to determine which of three treatments, active surveillance, prostatectomy, or conformal radiotherapy, is the best. This study will follow men for 10 to 15 years (Bastian et al., 2009). The Canary Prostate Active Surveillance Study is a multicenter study that seeks to determine the aggressive prostate cancers that progress on active surveillance from those cancers that will remain indolent (Newcomb et al., 2010). The Surveillance Therapy Against Radical Treatment, a multicenter Phase 3 trial, will enroll 2,130 men into either active surveillance or aggressive treatment (surgery or radiation). The primary outcome, disease-specific survival, will not be available until 2025. Lastly, the Prostate Cancer Research International: Active Surveillance study, a Web-based trial, will provide important information on changes in PSA values and kinetics (van den Bergh et al., 2007). These studies have the potential to address important questions related to the selection of active surveillance. Because these answers are at least 10 years in the future, men will continue to make their decision to elect a course of active surveillance with limited evidence.

The urologic medical community and nurse scientists investigating the effects of active surveillance continue to advocate for research that will help men make informed treatment decisions and then offer theoretically based interventions to help them manage the psychological aftermath inherent in a course of close monitoring for early stage prostate cancer (Kazer, Bailey, Colberg, Kelly, & Carroll, 2011). This concern occurs within the ongoing debate regarding PSA testing and which treatment really is better for men with early stage disease. Although the selection of active surveillance by men in the United States continues to decline (Moul, Mouraviev, Sun, Schroeck, & Polascik, 2009), urologists and cancer centers will offer patient selection guidelines on the basis of current but incomplete evidence. Eggener et al. (2009) found that only 1 of 262 patients who initiated a course of active surveillance developed bone metastases at 38 months. Forty-three additional patients initiated traditional therapy during the follow-up period of 29 months. Being able to adequately predict a man's disease risk would improve the likelihood that increasing numbers of men would view active surveillance in a favorable light (Klotz, 2009). Until we have the evidence to accurately identify the most appropriate men for active surveillance, the selection of this treatment strategy will remain underutilized, and the overtreatment of prostate cancer will persist.

Donald E. Bailey

ACUTE CARE OF THE ELDERLY

Older people have a greater prevalence of chronic diseases and disorders that lead to hospitalization. On average, people older than 65 years are hospitalized more than three times as often as younger individuals, and the length of their stay is estimated to be 50% longer than that of younger individuals. Nursing research that defines the evidence for practice interventions is needed for patients of all ages, and especially for the elderly (Capezuti et al., 2008). Nursing research that provides the basis for best practice for hospitalized elders is often embedded in interdisciplinary studies. Several studies have recently documented the essential nature of continuity of care across settings for optimal acute care outcomes (Boyd et al., 2010; Counsell, Callahan, Tu, Stump, & Arling, 2009). Increasingly, critical care of older adults has received attention, given the demographic shifts nationally and the advancing age of those in intensive care units, emergency rooms, and other critical care areas (Foreman et al., 2010).

Acute care of the elderly (ACE) units, which developed in the early 1990s, have shown improved outcomes among older patients who have been hospitalized. These units focus on precise and ongoing assessment of older adults, especially related to functional capacity and decline and follow the evidence to create individualized care plans (Malone et al., 2010). A classic study conducted by Landefeld, Palmer, Kresevic, Fortinsky, and Kowal (1995) demonstrated that patients admitted to an ACE unit were more likely to improve in activities of daily living and were less likely to be institutionalized. Asplund et al. (2000) also demonstrated that ACE units reduce the institutionalization rate of the hospitalized elders. The overarching framework for care on ACE units is interdisciplinary teaming (Siegler, Glick, & Lee, 2002). In a prospective study of 804 patients 80 years of age or older, 42% of the elderly patients with no baseline dependencies at admission had developed one or more limitations within 2 months (Hart, Birkas, Lachmann, & Saunders, 2002). Individuals older than 65 years are more likely to be admitted to acute care from the emergency department than other age groups. The hospitalized elderly are at an increased risk for poor outcomes such as increased length of stay, readmissions, functional decline, and iatrogenic complications, as compared with other age groups. There is a significant and serious readmission rate for older adults, ranging from 18% to 33% within 1 to 3 months and complications such as acute confusion and nosocomial infections, which are common among the elderly, resulting in increased morbidity and mortality (Lindenauer et al., 2010). Fifty-eight percent of patients who are hospitalized will experience at least one iatrogenic complication (Hart et al., 2002).

The composition of hospital staff has been shown to make a difference in patient outcomes (Aiken, Clarke, Silber, & Sloane, 2003; Estabrooks, Midodzi, Cummings, Ricker, & Giovannetti, 2005; Tourangeau et al., 2007). Nurse accountability and models of patients and nursing administration also have been examined (Baggs, 2007; Baggs, Ryan, Phelps, Richeson, & Johnson, 1992; Piquette, Reeves, & Leblanc, 2009; Scherb, Rapp, Johnson, & Maas, 1998). These studies provide some information regarding outcomes for the elderly, but intensive effort needs to be focused on understanding the differences between outcomes for younger individuals versus older individuals in the case of hospital care. For example, do older adults have difference cardiac output after coronary artery bypass surgery than younger individuals when other variables are held constant, such as premorbid conditions? Such parameters are needed for the improvement of care for the elderly. The Cochrane Collaboration published a review on interprofessional education (2009) that examined the effects on professional practice and healthcare outcomes and reported that data from six studies produced positive outcomes in satisfaction, collaboration, reduction of clinical error, and management of care for selected patient groups (Zwarenstein, Goldman, & Reeves, 2009). Although not specific to geriatrics only, the data are promising for improving care for hospitalized elderly given the majority of patients in hospitals are older adults.

Historically, elders were not considered to be "suitable candidates" for surgeries and treatments that today are considered routine. In the early 1970s, individuals older than 65 years were excluded from surgical intensive care units, as it was felt that the cost benefit was not going to be in favor of the older patient. Today, individuals in their 80s and 90s undergo open heart surgery and require appropriate postoperative care that only a surgical intensive care unit can provide (Silverstein, 2010).

Ethical issues abound regarding elders during a hospitalization. For example, if there is an insufficient number of beds in an intensive care unit, should older individuals be sent out to the floor before younger individuals? Are scarce resources allocated to younger individuals before they are used to care for the elderly? Further, elder abuse, a serious and potentially fatal syndrome, is frequently overlooked when elders come into the hospital with severe symptoms, such as bilateral bruising, histories incompatible with injuries, and overt fear of caregivers. These issues are a part of ACE and need to be addressed with rigorous research studies. Studies involving younger individuals need to be replicated among older adults to discern differences between the age cohorts.

Terry Fulmer
Sarah Pernikoff

ADDICTION CARE

Addiction is usually defined as a chronic, relapsing brain disease. It is characterized by the compulsive nature of the use of mood altering substances and behaviors. Over time, the structure and the function of the brain are changed (American Psychiatric Association, 2000; Angres & Bettinadi-Angres, 2008; Kleber et al., 2006; National Institute on Drug Abuse [NIDA], 2010). The individual may begin to display physical, cognitive, and behavioral symptoms. The course of the disease is marked by periods of use and abstinence with symptoms of withdrawal and the development of tolerance. Frequently, physical and/or additional psychological disorders are also present.

Historically, substance abuse and substance dependence have been classified as psychological disorders. Treatment has been typically provided in a psychiatric setting, but individuals experience a variety of symptoms and enter care through many different portals. Nurses are usually the direct care provider at all points of entry. This would suggest that all nurses should have at least a basic understanding of the disease of addiction. Even so, nursing has seen addiction care as a specialty on its own or under mental health. There are professional nursing organizations dedicated to the specialties of addictions and psychiatric nursing. The International Nurses Society on Addictions was established in 1975. Addictions nursing certifications were offered through the Addictions Nursing Certification Board at the generalist level (Certified Addictions Registered Nurse) starting in 1989 and at the advanced practice level (Certified Addictions Registered Nurse–Advanced Practice) in 2000. The American Psychiatric Nurses Association has been in existence since 1986.

In the past few years other nursing specialty organizations, for example, the Association of Nurses in AIDs Care and the American Society of Pain Management Nurses, have been adding a focus on substance abuse disorders because of the comorbidity of their disorder with addiction. Other specialty nursing organizations focus on addiction because of the risk for substance abuse or dependence that their members experience. Statistics support that all health care provider groups have a 10% prevalence for substance use, abuse, or neglect. In each group, from 6% to 8% of the providers may use to the extent that their practice is negatively affected. State Boards of Nursing discipline approximately 6,000 nurses each year because of substance abuse or dependency. Taking into consideration the numbers of individuals and professionals affected each year by the disease of addiction, the American Association of Colleges of Nursing (1998) introduced a position statement that outlined the importance of including substance abuse education in all curriculums in all schools of nursing. To date, most nursing schools have not responded to the recommendations of this position statement.

In the early thirties, alcoholism was explained by attributing it to an allergy (Angres & Bettinadi-Angres, 2008). One of the best-known figures in the study of addiction, Bill Wilson, was inspired to start Alcoholics Anonymous after experiencing treatment under that theory. Hospitals in Minnesota attempted to partner with Alcoholics Anonymous, giving rise to an altered concept of substance abuse called the Minnesota Model. This was the beginning of a disease concept for addiction. Twenty years later, E. Morton Jellinek would conduct research with male alcoholics and develop the Jellinek Curve (http://www.in.gov/judiciary/ijlap/docs/jellinek.pdf) that became the basis for his Disease Concept of Alcoholism.

Then as now, diagnosis of this disease depends on the evaluation of presenting signs and symptoms reported by the affected individual, which are then fitted into a defined set of elements or criteria (Doweiko, 2006). Many health care professionals continue to work on a theory of addiction that will be accepted regardless of the specialty area or expertise of the practitioners. This work continues to be difficult because definitions and terminology can vary from area to area, and many individuals continue to believe that addiction is a choice or due to a lack of willpower. The Center for Substance Abuse Treatment, a part of the Substance Abuse Mental Health Services Administration, the NIDA, and the National Institute on Alcohol Abuse and Alcoholism are the main resources for funding of research and information about substance abuse and dependence. Many educational documents have been made available through publications available on their Web sites.

According to the 2008 National Survey on Drug Use and Health (NSDUH) for Americans 12 years and older, an estimated 20.1 million Americans (8%) currently used illicit drugs and 129 million (51.6%) were current users of alcohol. More than 100,000 Americans die, and more than half a trillion dollars is spent each year as a result of the impact of substance abuse and addiction (NIDA, 2010). Using the *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition, an estimated 22.2 million persons (8.9% of the population 12 years or older) met the criteria for substance dependence or abuse in the prior year. Some 3.1 million Americans met the criteria for dependence or abuse of both alcohol and drugs, 3.9 million for dependence or abuse of just illicit drugs, and 15.2 million for abuse or dependence of just alcohol (Substance Abuse and Mental Health Services Administration, 2009). In 2008, 23.1 million individuals (9.2% of those 12 or older) were in need of substance abuse treatment, but only 2.3 million (0.9%) received it.

Every segment of the population is equally susceptible to this disease. Adolescence seems to be the period of time where use is the highest. Educational programming has been directed toward prevention in an attempt to decrease the initial experimentation, but untreated use and abuse becomes dependence. More effort needs to be directed toward educating parents, teachers, other adults in authority, and health care providers about recognizing the signs and symptoms of use and abuse to increase the referrals to treatment. Efforts have been made to integrate systems of service, that is, mental health, substance abuse, and primary care. Consideration is being given to understanding the dynamics of different populations in the development of treatment approaches and guidelines.

Just as the theoretical understanding of addiction as a disease process shaped the field's understanding of addiction, so has the theoretical approach to treatment changed in an effort to increase credibility and meet the demands of the current climate. With increasing health care costs and declining quality, the Institute of Medicine (IOM) produced *Crossing the Quality Chasm* (IOM, 2001) and *Improving the Quality of Health Care for Mental and Substance-Use Disorders* (IOM, 2006). These two documents recommend developing a health care system that is safe, effective, patient-centered, timely, efficient, and equitable and serve as the framework for a redesign of the health care system on the basis of six goals: (1) adapting care delivery to the new process; (2) effective use of information technology; (3) workforce adaptation and management; (4) effective teaming of providers and coordinating care according to patient conditions, services, and settings; (5) measuring quality; and (6) quality-based payment (IOM, 2001; Pincus et al., 2007). One of the changes that has risen from these recommendations has been evidence-based research for evidence-based practice. Although other definitions exist, the most widely accepted nursing definition of evidence-based practice is that of Porter-O'Grady. Evidence-based practice includes the integration of best research evidence with clinical expertise and patient values (Boswell & Cannon, 2009; Malloch & Porter-O'Grady, 2006; McCarty, 2010).

The social changes after World War II identified the need for nursing research in the 1950s. Priorities began to be set, and master's and doctoral programs for nurses became available. Research focused on clinical practice, quality improvement, and establishment of evidence-based guidelines and standards of care (LoBiondo-Wood & Haber, 2006). Now in the twenty-first century, the call for an evidence base to provide guidance in setting and achieving specific outcomes from treatment approaches in all practice settings has given nursing the opportunity to be represented in interdisciplinary networks in any practice setting that nurses choose for their specialty. That has led to nursing representation on the National Quality Forum Task Forces, panels established by the Agency for Healthcare Research and Quality (2006) and the Center for Substance Abuse Treatment, researchers for organizations, agencies, facilities, and government programs, and as authors for educational and professional publications.

The goals of nursing and addiction care research are closely aligned because they are based on clinically relevant research and clinical expertise guided by the unique preferences of the patient (IOM, 2001; McCarty, 2010). According to the National Quality Forum (2007), research to this point has focused on four general areas: identifying substance use conditions, approaches for initiating and engaging participation, therapeutic interventions, and coordination of care. Some of the changes are integrated screening; protocols for addressing positive screens, brief interventions, and referrals; treatments and pharmacotherapy based on empirical data; and established performance and outcomes measurements (Baird & Fornili, 2008; McCarty, 2010). Federal projects are addressing integrated treatment for comorbid mental health and substance abuse disorders; Screening, Brief Intervention and Referral to Treatment for primary care providers; clinical nursing guidelines for the use of suboxone; clinical guidelines for opioid addiction treatment; and issues with addiction and criminal justice.

The evidence-based research and the use of evidence-based practice are in their infancies for nursing and the addiction field. Resistance comes from concerns that approaches are simplistic and manualized. Empirically based treatment needs to be able to address all issues associated with addiction comprehensively. Research that links theory, education, and practice will be needed that focuses on diverse populations, directs the development of curriculums, establishes priorities for workforce development, and influences the direction of policy decisions. All nurses regardless of specialty can participate by reading and sharing applicable research within their own specialty area that increases their own expertise and improves patient care (Kronenfeld et al., 2007; LoBiondo-Wood & Haber, 2006; McCarty, 2010). Nurses practicing in the specialty areas of addiction and mental health can participate in, conduct, or collect data for a variety of research improving quality of addiction care and increasing knowledge about the disease.

Carolyn Baird

ADHERENCE/COMPLIANCE

Adherence is defined as the degree to which behavior corresponds to a recommended therapeutic regimen (Haynes, Taylor, & Sackett, 1979). Numerous terms have been used to describe this behavior, including compliance, therapeutic alliance, and patient cooperation. Although the literature is filled with discussion of the acceptability of these terms and the differences between them, most investigators view the terms as synonymous and independent of the decision to engage in a particular therapeutic regimen. The most complete literature can be obtained from structured databases with the term *patient compliance.*

Adherence to health care regimens has been discussed in the literature since the days of Plato. However, little systematic attention was given to this phenomenon until the 1970s, when there was a proliferation of research. One of the first reviews of the literature was published in *Nursing Research* in 1970 by Marston. Since that time, there has been a profusion of research from a variety of disciplines. The majority of the research has been focused on patient adherence, although there is a smaller body of literature on the adherence of research staff to clinical protocols and a growing body of literature on provider adherence to treatment guidelines.

Studies on adherence have focused primarily at the stage of maintaining a prescribed and adopted treatment regimen. Adherence, however, is important from the time of regimen advice to the acquisition of the medication, food, exercise equipment, and so forth, required to carry out that advice for the initiation of care, design and accurate management of the regimen, and contribution over the short and long term. These preceding stages have not been well studied.

One of the issues that continue to arise in discussions of patient adherence is patient autonomy. Is nonadherence a patient right or is adherence a patient responsibility? This argument presumes that the patient is aware of his or her own behavior and has consciously decided not to follow a treatment regimen. The literature suggests that less than 20% of patients with medication regimens consciously decide not to engage in a treatment program. Those patients who have decided to follow the regimen but do not carry it out are unaware of episodic lapses in behavior or have difficulty in integration of the health care regimen into their lives. The most common reasons given by patients for lapses in adherence are forgetting and being too busy. This group comprises on average 40% to 50% or more of patients in a treatment regimen.

The problem of nonadherence is costly in terms of dollars and lives. The national pharmacy council estimates that nonadherence to pharmacological therapies costs $100 to $300 billion annually. Although the cost of nonadherence to nonpharmacological therapies has not been estimated, the contribution to morbidity and mortality is high. Failures to quit smoking, to lose and maintain weight, to exercise regularly, to engage in safe sex practices, to avoid excess alcohol, and to use seat belts contribute significantly to declines in functional ability as well as to early mortality. Further data suggest that nonadherence to pharmacological as well as nonpharmacological therapies contribute to excess hospitalization and complication rates.

Poor adherence then is a significant problem of direct relevance to nursing. Nurse practitioners may prescribe or recommend therapies. Home health and community nurses provide education and assistance in carrying out health care advice. Hospital, clinic, and office nurses provide education regarding treatment plans. There is a need for intervention studies that will guide practice as nurses prepare and support patients in the conduct of treatment regimens.

Research on adherence has been focused heavily on the determination of the extent of the problem and on predictors or contributing factors. The 2010 report on medication adherence by the Cochrane Collaboration suggested that just 70 randomized controlled studies have evaluated interventions to improve medication adherence and examine both adherence and clinical indicators as outcomes. Thirty-six reported improvement in adherence, 25 in outcome. Most of these used general educational or behavioral counseling interventions. Improving convenience system-wide interventions have shown modest improvements with the use of case managers. Fewer studies have examined adherence to lifestyle behaviors.

One problem in evaluating interventions and identifying relevant predictors is that of measurement. Most clinical studies have relied on self-report of adherence. There is a growing body of evidence indicating that individuals do not report accurately, and those reports are biased toward an overestimate of performance. Thus, alternative strategies are being used to obtain better information, such as electronic monitors, PDAs, and other technologies.

Future research on adherence should address strategies by which nurses can improve adherence to treatment regimens with attention directed toward various age groups, clinical populations, and regimen behaviors across the range from decision to adopt to long-term maintenance. The research would benefit from theoretical approaches to the problem of patient adherence and the design of intervention strategies. Effective strategies delivered by nurses have considerable promise of a favorable impact on health outcomes and costs.

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Jacqueline Dunbar-Jacob

ADVANCE DIRECTIVES

Despite the advances in medicine and technology that have occurred over the past century, it remains imperative for all individuals to consider and plan end-of-life care. Since the late 1960s, individuals have been encouraged to obtain greater control in the decisions that affect their future medical treatment and assure advance directives are in place. Advance directives are legal documents that allow a patient to express their choice about medical care or name another individual to make decisions regarding medical treatment in the event that they are unable to make decisions themselves. As many more Americans with chronic medical conditions and poor medical prognoses experience the suffering and costs associated with end-of-life care, the need for adults to maintain their autonomy and their dignity at end of life has prompted health care providers and lawmakers to encourage the development and implementation of advance directives.

There are two forms of advance directives: the development of a living will and the designation of health care powers of attorney. In 1967, Luis Kutner, an attorney from Illinois, proposed that individuals needed to have a way to speak to how they envisioned their health care management when they would not be able to verbally express their wishes. This document is a written statement that states under what specific conditions and individual would want to accept or reject life sustaining medical treatment. Because the individual is alive, yet not able to make decisions, this document is titled a "living will." The living will is only to be used if the individual is unable to provided informed consent or is medically incapacitated. The living will includes specific information regarding an individual's desire for medical interventions such as the use of life support equipment such as ventilators, life saving procedures such as cardiopulmonary resuscitation, organ and tissue donation and medical management such as the use of feeding tubes, analgesia, and administration of hydration. In 1976, California became the first state in the United States to legally sanction living wills. Within a year, 7 states had passed bills and 43 states had considered the living will legislation, which subsequently progressed on a state-by-state basis. By 1992, all 50 states had passed legislation to legalize some form of advance directives.

A health care power of attorney, also known as a durable power of attorney or a health care proxy, appoints a key individual to function as the formal decision maker and make all decisions regarding the medical care and treatment of an individual should that individual lose their decision making ability. The designation of a health care power of attorney is broader than the development of a living will because it includes all medical decisions besides those pertaining to life sustaining treatment. The appointed designee must determine what the individual would desire on the basis of past discussions and the individual's moral, spiritual, and personal beliefs. The health care proxy has the same rights to accept, to refuse, or to request medical treatment that the individual would have if he or she has capable of making and communicating decisions. Because of this, some states statutes combine a power of attorney and a living will into one document.

Should a patient not execute a health care proxy or living will, many states will designate a surrogate decision maker. Some states will only do so under certain conditions such as an individual having a terminal illness who is permanently unconscious or for specific types of treatment such as cardiopulmonary resuscitation. In an emergency setting, outside of a hospital or medical facility, advance directives may not apply. Some states may or may not allow emergency medical service personnel to resuscitate patients who have a bracelet designating themselves as a "do not resuscitate" patient.

The topic of advance directives is an extremely controversial subject that has created much debate regarding the right to stop medical treatments that could prolong a patient's life and allow natural death to occur. The debate and discussion became widely known to the public in 1976 during the first "right to die" case surrounding Karen Ann Quinlan and again in 1990 during the case of *Cruzan v. Director Missouri Department of Health*. Both cases involved the desire of the patient's families to discontinue feedings that were prolonging the lives of two young individuals who did not have any clear verbal or written instructions regarding their end-of-life treatment desires. It was not until 1990 and the case of *Cruzan v. Director Missouri Department of Health* that the U.S. Supreme Court agreed to review a case regarding advance directives. Until that time, the Supreme Court held the belief that legislation surrounding advance directives should be determined at the state rather than the federal level. In 1990, the U.S. Supreme Court upheld the Missouri Supreme Court standard that required clear and convincing evidence of the patient's wishes before permitting the family of Cruzan to discontinue the tube feedings that were sustaining her life.

The U.S. government through the Congress and Supreme Court has demonstrated interest in assuring the public is aware of the benefits of advance directives. In 1991, the U.S. House of Representatives enacted the Patient Self Determination Act. This federal legislation validates the existence of advance directives in each state and stipulates that all hospitals who received Medicare or Medicaid reimbursement must assure that patients have or would like to have advance directives. Hospitals must offer assistance to patients in completing a directive upon patient request.

Although an individual may have advance directives, there are situations in which they may not be complied with. Many times, advance directives are not available when they are needed because of the patient not letting their loved ones know of the existence of such a document or a hospital may fail to include a copy of the patients specific advance directives in his or her medical chart. The interpretation of the terms within an advance directive document can cause debate, and a clearly written document may also not represent a patient's wishes as the reality of their own death becomes imminent. Health care proxies can have a difficult time following making decisions regarding life-sustaining interventions because of their own feelings and beliefs about death and their connection and relationship with the patient.

Further studies have demonstrated that a lack of advance care planning leads to issues, questions, and concerns regarding end-of-life care (Lawrence, 2010). Adults should be encouraged to complete their advance directives when discussing medical decisions with their health care providers. Stetler, Elliott, and Bruno (1992) found that 60% to 80% of patients would like to discuss end-of-life care issues with their health care provider at their office visit during a time that they are less anxious. Literature on end-of-life care reveals that patients and health care professionals, including physicians, nurses, and social workers, tend to avoid discussing decisions about preparing for end-of-life care (Rizzo et al., 2010). The Study to Understand the Prognoses and Preferences for Outcomes and Risks of Treatment (SUPPORT Principle Investigators, 1995) involved 4,805 patients in five teaching hospitals who were at an advance stage of illness. The study found that physicians often ignored advance directives regardless of efforts made to improved physician to patient communication regarding end-of-life decisions.

There are limited studies that focus on the effect and knowledge that nurses have regarding advance directives. Crego and Lipp (1998) found that more than 50% of the nurses of the 339 nurses that were surveyed in a 600-bed acute hospital did not have a good understanding of advance directives. Sixty-seven percent thought that the nurse was the most likely health care provider to assess the need for advance health care planning. Wood and DelPapa (1996) conducted a small survey of hospital nurses (n = 112) and found that 76% of nurses had a low level of knowledge on questions related to advance directives. A study by Scherer, Jezewski, Graves, Wu, and Bu (2006) assessed 210 certified critical care nurses regarding their knowledge and experience regarding advance directives. Results demonstrated that 94.8% of the critical care nurses felt that the nurse's primary responsibility was to ensure that the patient's decisions were met, 42.5% agreed that the information available on advance directives was sufficient to direct treatment, and 6% had low knowledge scores on questions surrounding advance directives.

The role that advance directives play in end-of-life care decision making will continue to be a topic of ongoing discussion and debate. This controversial discussion will continue to have an emotional impact on all those involved. Further research is required to explore the role health care providers play in assuring that patients and their families understand the importance of advance directives and that when in place, they are implemented and followed.

Kristy Dixon

AGEISM

On July 7, 2010, Robert Butler died at the age of 83 years. He was the first to use the term "ageism" and fought against stereotyping and prejudice of older adults through research and public policy. Butler himself was a living argument against ageism, working until 3 days before his death, demonstrating through his life and writings that older adults can maintain productive, optimistic, and engaged lives (Martin, 2010).

Ageism is a negative attitude or bias toward older people that can lead to a belief that older people cannot or should not participate in certain activities or be given the same opportunity as younger persons (Holohan-Bell & Brummel-Smith, 1999). Elders represent 50% of hospital days, 70% of home health services, and 90% of residents in nursing facilities (Mezey et al., 2008). Almost all health care personnel will find themselves at one time or another caring for the elderly. In fact, the majority of nurses will spend most of their career caring for older adults in a variety of settings and will face a personal experience with aging in a family member or with their won development. As these challenges are met, it is necessary to continually examine the development of attitudes and roles in the prevention of ageism. Older persons may be discriminated against because of the way they look, speak, or function in a society that values productivity, economic wealth, speed, youth, and beauty.

How to delineate aging and the aging process is a controversial and complex topic. Prejudice, stereotyping, and labeling may lead to policies for rationing health care: the withholding treatment based on age alone, a lack of qualified personnel to care for older adults, the underrepresentation of older adults in clinical trials, and the underrecognition of geriatric problems and syndromes (Butler, 2008; Wallace, Greiner, Grossman, Lange, & Lippman, 2006; Wilson, 2010). Ageism can be seen on personal levels in the daily care of older patients in a hospital and on a population level when older adults are excluded from disease screening or primary prevention programs (Ory, Hoffman, Hawkins, Sanner, & Mockenhaupt, 2003). As technology continues to advance, the ability to extend life becomes possible. This extension of number of years often comes at the price of chronic disease and a decreased quality of life. As the number of elders continues to grow at a rapid rate, the need to preserve quality of life while maintaining autonomy for older adults is imperative.

Nursing research in ageism focuses on several areas. Ageism research could encompass studies that address how to best educate health professionals aging, examination of student and practicing nurse's attitudes, sociopolitical issues impacting older adults, clinical care problems, and biological issues. Some of the current research impacting ageism involves the use of technology in multiple care settings (Tak, Benefield, & Mahoney, 2010), enhancing clinical care of elders through established programs (Allen & Close, 2010; Boltz et al., 2008), bolstering geriatric education in baccalaureate programs through additional coursework and educator training (Berman et al., 2005; Krichbaum, Kaas, Mueller, & Wyman, 2010; Miller, Van Son, Cartwright, & Allen, 2010; Wilson, 2010), and measuring the impact of gerontological research in schools of nursing (Maas, Buckwalter, Conn, & Tripp-Reimer, 2010).

The older population that is at the greatest risk of prejudice, stereotyping, and ageism, however, are persons with mental illness, dementia, and mental retardation. The diagnosis of dementia often stigmatizes both the patient and the family. As new technologies and diagnostic techniques become available, labels such as mild cognitive impairment also have the potential to stigmatize patients and families (Garand, Lingler, Conner, & Dew, 2009). Research has demonstrated links between cognitive impairment, cardiovascular disease, diabetes, and depression. This has highlighted the potential widespread impact of preventative measures and health maintenance in older adults. Further research on cognitive reserve in dementia and delirium has advanced the understanding of persons with multiple types of cognitive impairment and has exposed myths often held about this population, such as the inability to learn new information or to change behaviors (Jones et al., 2010; Kolanowski, Fick, Clare, Therrien, & Gill, 2010; Ory et al., 2003; Stern, 2009). This research is important as it forces the reexamination of stereotypes held about older persons and influences both care and treatment.

In addition to new diagnoses or labels, certain conditions or circumstances that were relegated to old age are becoming issues in younger phases of life, such as hearing loss. The resulting ageism and stigma (Wallhagen, 2010) that occurs with such conditions may be tempered by this shift.

The economic impact of ageism is and will continue to be significant to gerontological nursing. Robert Butler, in his book *The Longevity Revolution*, argues that we should continue to work beyond the age of 65 years because early retirement can be equated to wasted productive capacity (Butler, 2008). He maintains that this will help to combat ageist stereotypes. Beyond workforce issues, nurses will have a vital role in shaping the health care system at local and national levels as it continues to be reformed to meet the needs of our aging population (Beverly, Burger, Maas, & Specht, 2010).

Ageism will continue to be important in almost every area of geriatric nursing research. Ageism will influence both the type of research that is done and the public dissemination of research. Researchers must describe the relationship of ageism with qualitative and quantitative research in the areas of ethics, workplace studies, decision making and informed consent research, genetics, health promotion and prevention screening, cancer, presentations of disease, symptoms research, biomarkers of aging, quality of life, barriers to treatment, nursing home care and organizational studies, resource utilization in health care, dementia care, mental health, care of the disabled older adult, and care of the diverse older adult population. The increasing role of technology in mitigating stereotypes of aging will also be of great importance, as will the use of new technologies to allow older adults to live independently. At the same time, technology must not replace the human-to-human interaction (Harmon, 2010; Tak et al., 2010), which is the foundation of nursing.

Nurses must also be aware of the role of popular media in socializing nursing education, practice, and research. The popular media socializes multiple age groups to stereotypes. Nurses have the power to negate these typical roles, where older adults are seen as powerless. The media also portrays an "antiaging" campaign, where "70 is the new 60." Practicing nurses, student nurses, educators, and nurse scientists have the ability to show that older adults maintain productivity and purpose in life, and in their daily work they must go beyond the media stereotypes when examining aging and quality of life.

Researchers have agreed that past and present experience with the elderly, faculty role models, and continuing education positively affects attitudes on aging (Burbank, Dowling-Castronovo, Crowther, & Capezuti, 2006; Wallace et al., 2006). Several government and privately funded programs are promoting positive attitudes toward older adults by showcasing geriatric nursing as a challenging and attractive specialty for practicing nurses, bringing national attention to nursing care of the elderly, reaching out to hospital, home care, and nursing home nurses, and illustrating the need for more advance practice nurses and for basic gerontology content in baccalaureate nursing programs to care for one of the most vulnerable populations (Berman et al., 2005; Boltz et al., 2008; Davis, Beel-Bates, & Jensen, 2008; Maas et al., 2010; Mezey et al., 2008; Rieder, 2006).

Nursing has a vital role in combating ageism and continues to be in a key position to minimize ageist attitudes in the future. Nurses must be involved in future studies to investigate these important and relevant areas of research and in dissemination of these findings through best practice initiatives. In addition, nurses must be prominent in other relevant arenas (intergenerational linkages, global attitudes on aging, and workforce) that challenge stereotypes of aging and promote appropriate views and care of older adults. Perhaps the most lasting and powerful way to combat ageism is through mentoring of practicing nurses, nurses in training, and young adults by encouraging active dialogue and interaction with older adults.

Andrea M. Yevchak
Donna M. Fick

ALZHEIMER'S DISEASE

Alzheimer's disease (AD) is a psychiatric diagnosis that affects the lives and families of some 5 million individuals who are diagnosed (Alzheimer's Association, 2010). The *Diagnostic and Statistical Manual of Mental Disorders* outlines a detailed set of criteria for the diagnosis of AD, specifically multiple cognitive deficits, including memory impairment, and neurological symptoms, including one of either agnosia, aphasia, apraxia, and impaired executive function. Microcellular damages are notable because of the formation of beta-amyloid plaques and tangles. In addition, these physiological deficits create a systemic effect on the macrolevel function and affect an individual's ability to work or function in everyday life.

In nursing home residents, 61% were cognitively impaired; however, only 12 had a diagnosis in their records indicating cognitive disturbance, and 43% were depressed (McDougall, 1998). A study of the prevalence of dementia among Black and White residents being admitted to nursing homes found rates 50% higher among Blacks than Whites. In other studies, the prevalence of dementia in Maryland nursing homes was estimated between 49% and 54% (Magaziner et al., 2000; Weintraub et al., 2000). With the increase in the number of assisted living facilities and continuing care retirement communities, projections are following the same patterns as nursing homes. For example in Maryland, the prevalence of dementia and other psychiatric disorders was 68% from a random sample of 22 facilities. Differences were notable between large (63%) and small facilities (81%). These findings support earlier findings that differentiate the facilities on the basis of the number of residents (Rosenblatt et al., 2004).

The number of new cases of AD, particularly for minority elders, is expected to increase threefold to 13.2 million by 2050 (Hebert, Scherr, Bienias, Bennett, & Evans, 2003). The health disparity between these groups of older adults and mainstream groups is illustrated by the disproportionate prevalence of cognitive impairments and dementia in this population. African Americans are projected to increase more than 31% and Hispanics more than 86% compared with a 15% increase in Anglos. Nationwide, by 2025, 10% of the population will be older than 65 years, a trend that is reflected in the populations of many countries around the world. How cognitive function is determined also plays a major role in recognition of an impairment in minority populations (Parker & Philp, 2004; Wilder et al., 1995).

With the increase in minority elders projected, for example, Hispanic to increase 86%

and African Americans more than 31% compared with a 15% increase in Anglos, these projections of cognitive decline are alarming. Of those adults 65 years and older enrolled in the Health and Retirement Study, 12.7% of both sexes had moderate or severe memory impairment defined as four or fewer words recalled out of 20 on combined immediate and delayed recall tests (Federal Interagency Forum of Aging-Related Statistics, 2006). Unknown from this longitudinal data was the source of the memory impairment. What is known is that racial and ethnic minorities, females, older persons, and persons with limited education are at higher risk for both obesity and cognitive decline.

Despite uniform detection methods and controlling for reported duration of dementia symptoms, measured cognitive impairment is significantly more severe when AD is recognized in Blacks compared with Whites (McDougall, Vaughan, Acee, & Becker, 2007). In a sample of Black and White community elderly, age and race were statistically significant predictors of memory performance in the multiple regression analysis, even accounting for education, depression, gender, and memory complaints (Shadlen, Larson, Gibbons, McCormick, & Teri, 1999). The rate of decline in Blacks with AD may be slower than that in Caucasians. Researchers from the Chicago Health and Aging Project demonstrated that greater social resources, as defined by social networks and social engagement, were associated with reduced cognitive decline in old age among 6,102 Black elderly (Barnes, Mendes de Leon, Wilson, Bienias, & Evans, 2004). These relationships remained after controlling for socioeconomic status (SES), cognitive activity, physical activity, depressive symptoms, and chronic medical conditions. Education has particular relevance for Black and Hispanic elderly, who often have less formal education than their White counterparts and are particularly afraid of cognitive or mental disorders.

Nursing research investigates not only the screening, assessment, and diagnosis of AD but also the impact of the disease on the affective, cognitive, and functional ability and the everyday lives of individuals. In addition, the theoretical paradigms that investigators choose to guide their inquiries also systematically necessitate ongoing evaluation (McDougall, 1995a, 1995b; McDougall, & Becker, Arheart, 2006). In addition, understanding the impact of culture and social class on cognitive function and other important health outcomes requires research that takes a broader perspective and identifies intervening factors that affect memory performance.

Ethnicity, race, and culture are important considerations in cognitive aging. After examining the relationship between memory performance and SES, a positive correlation between memory performance and SES was observed, although there was no sufficient evidence to show that SES is not differentially related to memory performance (Espino, Lichtenstein, Palmer, & Hazuda, 2001; Herrmann & Guadagno, 1997).

Older Latinos had a mean age at Alzheimer symptom onset 6.8 years earlier than did Anglos. Of 89 Mexican American elders who were seen in an outpatient memory evaluation clinic, they had greater than expected moderate and severe memory impairment, high levels of instrumental activities of daily living impairments (83%), and high levels of depressive symptoms (63%). Older Mexican-origin cohorts have very low levels of education, a risk factor for AD. In the Hispanic Established Populations for Epidemiological Studies of the Elderly study, only 35.6% of the Mexican American elderly sample were not cognitively impaired by passing both the Mini-Mental State Examination (MMSE) and the executive clock-drawing task. In the Sacramento Valley epidemiological study of older Latinos, dementia prevalence was 4.8% but reached 31% in those 85 years and older (Black et al., 1999; Espino et al., 2002; Haan et al., 2003; Royall, Espino, Polk, Palmer, & Markides, 2004).

The Duke Established Populations for Epidemiological Studies of the Elderly study noted that cognitive problems were difficult to recognize in Hispanic families. When informants reported memory loss, 30% of participants were found not to have a cognitive loss. Among participants in whom family informants reported no memory loss, 75% were diagnosed with dementia or cognitive impairment. Mexican Americans were 2.2 times more likely than European Americans to have MMSE scores less than 24, indicating cognitive impairment (Watson, Lewis, & Fillenbaum, 2005).

Prevention of cognitive decline has ongoing merit for health promotion research. Aspects of lifestyle and SES, including diet, emotional state, and use of drugs, are of high interest to nurse scientists (Karlamangla et al., 2009).

Whether or not diabetic Hispanics are at an increased risk for cognitive impairment is uncertain. Cognitive aging studies have failed to assess the overall health and physical functioning in older subjects. Recently, investigators found decreasing serum antioxidant levels to be negatively associated with memory performance in a multiethnic sample of elderly (*N* = 4,809). Hispanic elders' memory complaints may be misclassified as cognitive impairment or dementia with the MMSE if other sociodemographic and medical conditions such as diabetes are ignored (Perkins et al., 1999; Wu et al., 2003).

Data from the Baltimore Longitudinal Study on Aging illuminated the association between depression and cognitive decline (Bierman, Comijs, Jonker, & Beekman, 2005). Four groups of individuals were compared: (1) cognitively normal controls with no Alzheimer pathology, (2) cognitively normal individuals with Alzheimer pathology, (3) individuals with mild cognitive impairment plus Alzheimer pathology, and (4) individuals with clinical diagnoses of dementia plus Alzheimer pathology. Depressive symptoms were assessed using the Center for Epidemiologic Studies Depression Scale. Individuals with Alzheimer pathology but no cognitive decline before death had significantly lower rates of depression than cognitively normal controls with no Alzheimer pathology and individuals with Alzheimer pathology plus clinical diagnoses of dementia.

A review of 23 studies of alcohol use found that alcohol use during adulthood in moderation may protect the individuals from developing dementia in later life (Peters, Peters, Warner, Beckett, & Bulpitt, 2008).

In conclusion, the findings from a state of the science consensus conference on AD convened by the National Institutes of Health was recently published (Daviglus et al., 2010). The risk factors identified were current tobacco use, apolipoprotein E ε4 genotype, and certain medical conditions, which were associated with increased risk (Plassman, Williams, Burke, Holsinger, & Benjamin, 2010). Although the identification of protective factors was limited, as reported by the authors, the quality of research from observational studies (*N* = 122) was low.

The major outcome from the conference was a change in the criteria for diagnosing AD toward an earlier diagnosis using biomarkers, such as brain scans and spinal taps. Another change is categorizing AD into three stages: preclinical disease, mild cognitive impairment, and Alzheimer's dementia. Complaints and problems with everyday memory are primary determinants of whether an individual seeks medical attention or is motivated to participate in cognitive aging research and/or engage in activities such as mental stimulation, social engagement, or lifestyle adjustment. The AD research funding at the National Institutes of Health for fiscal year 2011 is estimated at $480 million.

Graham J. McDougall Jr.

APPLIED RESEARCH

In an attempt to differentiate between various types of research, the scientific community uses a myriad of terms, which, however, tend to fall into a discrete classification. On the one end, terms such as *basic, fundamental,* and *theoretical* research are used to refer to research focused on discovering fundamental principles and processes governing physical and life phenomena. On the other end, we find such terms as *applied, clinical, practical,* and *product research*. These refer to the application of the findings of basic/fundamental/theoretical research to generate research aimed at answering focused and problem-specific questions. Although it is the subject of ongoing debate, it is assumed that there are fundamental principles and processes that are core to the nursing discipline and its central tenets of health, patient, nurse, and environment. In addition, it is assumed that nursing draws on fundamental principles and processes discovered in other disciplines to generate new knowledge about nursing and patient care.

Under these assumptions, applied research in nursing can be defined. The etymology of *applied* goes back to the Latin *ad-plicare,* meaning to put something (a law, a test, etc.) into practical operation. Applied research in nursing, then, refers to research aimed at concrete and practical issues and questions of concern to the delivery of nursing care. The most evident type of applied research is intervention research—from exploratory investigations to randomized controlled trials. This type of applied research is aimed at providing answers to questions about the effectiveness, efficacy, and safety of nursing interventions.

Yet nonintervention (or descriptive) research may be categorized as applied research as well if it meets the general criterion of being focused on concrete and practical issues and questions about nursing care. Other types of applied research in nursing include studies on models of care, research on organizational or other systems-level determinants of care, analyses of the nursing work force, and studies on the economic aspects of nursing care.

Ivo Abraham
Sabina De Geest
Karen MacDonald

B

BASIC RESEARCH

Basic research includes all forms of scholarly inquiry for the purpose of demonstrating the existence or elucidation of phenomena. Basic research is conducted without intent to address specific problems or real-world application of knowledge. As a discipline and a science, nursing is informed by knowledge from basic and applied research, and nursing disciplinary knowledge is integrated into the broader context of the whole of human knowledge.

The origins of nursing research trace back to Florence Nightingale. Over time, the majority of the scholarly work is best categorized as applied rather than basic research in that nursing research has been conducted for the primary purpose of solving problems related to human health. Nursing seeks knowledge from the perspective of the human experience of health. Human perceptions and experiences of health are studied with the intent to generate knowledge to solve problems through nursing care and practice.

There is a cadre of nurses who were doctorally prepared in the basic sciences, both social and biological, as part of the U.S. Public Health Service Nurse Scientist Training Program from 1962 until the late 1970s. Nurses with doctoral degrees in basic sciences were prepared to contribute as basic researchers, and then they adapted their knowledge and skills to conduct nursing research. Despite the growing number and popularity of doctoral programs in nursing, small numbers of nurses continue to pursue degrees in the basic sciences in the United States. This educational path is used more often in countries where doctoral programs in nursing are not available. Another link between the basic sciences and nursing has evolved as a result of doctoral students in nursing pursuing a graduate minor in a basic science or a postdoctoral fellowship in a basic science. These basic research programs for nurses with doctoral degrees in nursing are facilitated by nurses with doctoral degrees in basic research disciplines. Nurse researchers often engage in basic research to generate knowledge that may lead to new perspectives for applied research in nursing.

Sue K. Donaldson

BEHAVIORAL RESEARCH

An examination of behavioral research is best begun by examining what it is and differentiating it from related areas of research. Behavioral research within nursing generally refers to the study of health-related behaviors of persons. Studies may include the following areas: (a) health-promoting behaviors such as exercise, diet, immunization, and smoking cessation; (b) screening behaviors such as mammography, breast self-examination, and prostate examinations; and (c) therapeutic behaviors such as adherence to a treatment regimen, blood glucose monitoring, participation in cardiac rehabilitation programs, and treatment-related appointment keeping. The research spans medical and psychiatric populations. It is directed toward an understanding of the nature of behavior and health relationships and to the modification of behaviors that affect health. It has been estimated that over half of premature deaths could be prevented if health behaviors were altered.

Behavioral research has its roots in learning theories that arose in the early part of the 20th century. Classical or respondent conditioning was followed by instrumental or operant conditioning and evolved into the cognitive–behavioral theories that dominate the field today. In classical conditioning, an unconditioned stimulus is paired with a conditioned stimulus, resulting in the development of a conditioned response. Much of the research emphasizes conditioned physiological responses. An example is found in the study of anticipatory nausea and vomiting during chemotherapy. In this case, chemotherapy (unconditioned stimulus) may induce nausea and vomiting. After several exposures to chemotherapy in a particular setting (conditioned stimulus), the setting itself may induce nausea and vomiting (conditioned response) prior to and independent of the actual administration of the chemotherapy (unconditioned stimulus). Another example is reciprocal inhibition or desensitization in which anxiety is viewed similarly as a conditioned response to stimuli. An incompatible response (relaxation) is paired with progressively stronger levels of the conditioned stimulus to inhibit anxiety responses.

With instrumental or operant conditioning, behavior is seen as arising from environmental stimuli or random exploratory actions, which are then sustained by the occurrence of positive reinforcement following the behavior. Laws have been established that address the identification of reinforcers, the schedules of administration of reinforcers for initiation and maintenance of behavior, and the strategies for the extinction of behavior. In this model, motivation is seen as a state of deprivation or satiation with regard to reinforcers. Numerous strategies have evolved from this work, including but not limited to contracting and tailoring, which have been used in studies of patient adherence; token economies, which have been used in studies on unit management with the mentally ill or developmentally delayed; and contingency management, which has been used in the promotion of treatment behaviors such as exercise.

As the operant model has expanded over time, self-management or self-regulation has evolved as a special case of contingency management. With self-management, the individual is responsible for establishing intermediate goals, monitoring progress toward those goals, and administering self-reinforcement for success. Self-management has been studied particularly for chronic, long-term regimens such as those for diabetes, asthma, and cardiovascular disease.

In both of these models, there is an emphasis on behavior rather than motivation or personality or relationships, beyond that of the reinforcing behaviors of significant others. The history of the behavior is of less interest than the factors that currently sustain the behavior. An empirical model is used with an assessment of the frequency or intensity of the behavior over time, the stimulus conditions that precede the behavior, and the consequent or reinforcing events that follow the behavior. Intervention is then directed to the specific areas targeted by the initial assessment. Detailed assessment continues through the course of intervention and often through a period following intervention to assess maintenance or generalization.

Each of the cognitive–behavioral models identifies a cognitive feature as a major motivational determinant of behavior. Self-efficacy theory postulates the role of perceived capability to engage in a behavior under various conditions. The theory of reasoned action postulates that intention to engage in a behavior is significant and is influenced by beliefs regarding behavioral outcomes and attitudes toward the behavior. The health belief model postulates that one’s perceptions about the illness in terms of its threat (severity and susceptibility) as well as the perception of the benefits and barriers to engaging in the behavior influence intentions and subsequently behavior. The common sense model of illness proposes that the individual's own model of the illness influences his or her illness or treatment-related behaviors.

Behavioral research can be distinguished from psychosocial research, which tends to emphasize adjustment and coping as well as predictor and moderator variables arising from the psychological state or the social environment of the person. Behavioral research, including cognitive–behavioral studies, emphasizes behavior. In the classical and instrumental models, observable behavior is stressed. In the cognitive–behavioral model, both observable and covert behaviors are stressed. Within nursing, much of the behavioral research has addressed participation in treatment, exercise, sexual behaviors, health promotion, breast self-examination and mammography utilization, childbirth and maternal behaviors, behavioral symptoms of dementia, self-management in chronic conditions, management of alcohol or drug dependency, and role of biofeedback in such behaviors as pelvic floor muscle exercise in incontinence and heart rate variability. Unlike psychosocial studies, factors such as personality, coping strategies, and socioeconomic status are not primary interests; however, they may be of interest in determining reinforcers and stimulus conditions.

There is an additional body of behavioral research that tends to be interdisciplinary in nature and is of relevance to nursing. There are studies in the community to modify health behaviors within populations and studies within multicenter clinical trials that attempt to influence the health behavior or protocol-related behaviors of research participants. Also there is a broad set of studies to identify the relationship between behavior and disease etiology, such as studies of the role of exercise on the maintenance of function in the older adult, mechanisms of addiction in smoking behavior, and effect of neurotransmitters on eating behaviors. This field has come to be known as biobehavioral research.

Given the prevalence of lifestyle behaviors that adversely affect health and the management of illness, research to understand and modify those behaviors would benefit the individual as well as the population. There is a need for nursing research to expand into the interdisciplinary arenas, particularly in the examination of health behavior change in the community, the studies within multicenter clinical trials, and the etiological relationship between behavior and health and illness. Further, many of the studies in nursing have been descriptive in nature or have focused on the development of assessment instruments. Few of the studies have examined how to intervene with behaviors that contribute to the development or progression of illness. This research, however, would be useful to better direct interventions with patients.

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Jacqueline Dunbar-Jacob

BIOFEEDBACK

Biofeedback is a training program in which individuals are provided with visual or audio information about their physiological state. The most commonly indexed physiological states include heart rate, heart rate variability (HRV), respiration, blood pressure, body temperature, peripheral sweating level (also known as galvanic skin response, electrodermal response, or skin conductance), brainwave electroencephalogram (EEG), and muscle activity electromyography. The physiological data are measured using noninvasive sensors, and the data are processed and displayed through a computerized device. Through the feedback training, individuals learn techniques to consciously regulate involuntary bodily functions such as balancing the autonomic nervous system. Psychological responses often co-occur with the change of physiological and emotional states. With repeated practices, individuals often become mindful about the self-regulation technique and may achieve the desired physiological and psychological states without the assistance of external devices.

The goal of biofeedback is to enable the process of self-regulation for health promotion and peak performance (Association for Applied Psychophysiology and Biofeedback, 2008).

Although in the past biofeedback for chronic symptom patterns has been thought to be simply training muscles and body functioning through operant conditioning, now it is more common to consider the brain and the central nervous system as the central focus of treatment. It is, after all, the electrical-biochemical systems through which all bodily activity is finally determined. To focus on the brain–neural pathway, it acknowledges the mind–body interface and the centrality of the brain in the disease process.

The use of biofeedback and its accompanying belief in helping individuals master self-regulation of body function and optimum states has been greatly impacted by the cellular research in the recent years. Some groups of neuroscientists have explored the progress of using stem cells as a way of repairing organs. Other movements in research have realized exciting possibilities in tracing evidence of the capability of the body to perform repair by means of neurogenesis and neuroplasticity (Eriksson et al., 1998; Kempermann & Gage, 1999; Kempermann, Kuhn, & Gage, 1997; Magavi, Leavitt, & Macklis, 2000). Early evidence of the possibility of generating growth or regrowth in neural tissue was reported by Diamond, Johnson, Protti, Ott, and Kajisa (1985). In these early studies, Diamond et al. stimulated brain growth in older rats by enriching the environment. From this study were derived the studies by Budzynski (1996) and Budzynski and Budzynski (2000) to improve cognitive functioning of elderly humans by enhancing the brain with neurofeedback and light–sound stimulation. Results of studies on cellular restoration of nerve tissue together with reports of improvement of body functioning through neurofeedback suggested that changes in bodily functioning can be reached through the brain.

By managing appropriate change in the EEG or the brain's electrical activity, the body not only can rid itself of chronic symptoms but also can heal itself. In addition to augmenting neurological function, the technique of self-regulation has also been exploited to promote cardiovascular health. The most easily accessed method of change is the use of selected sounds to alter both brain and cardiovascular function. Studies have shown that brainwave entrainment using audio-guided relaxation training effectively reduced the blood pressures in groups of elderly (Tang, Harms, Speck, Vezeau, & Jesurum, 2009; Tang, Harms, & Vezeau, 2008). These new directions for intervention are reaching consumers of health care.

There are three major organizations for biofeedback professionals: the Association for Applied Psychophysiology and Biofeedback, the Biofeedback Certification Institution of America, and the International Society for Neurofeedback and Research. There are more than 100 nurse professionals in the Biofeedback Certification Institution of America, the certifying body for biofeedback or neurofeedback. Untold other nurses are practicing without current certification. Many of these practitioners are performing exciting biofeedback or neurofeedback work with target chronic problems, such as lack of urinary control, attention deficit disorder, epilepsy, stroke, mild head injury, migraines, and other symptom patterns. However, they practice outside the mainstream of nursing's institutions of care, privately alongside multiple other health disciplines. Other schisms are that these practitioners are not inclined to undertake research. Those who are doing research tend to be faculty in universities who have little access to practice settings. The nursing biofeedback field could advance markedly if these activities and professionals could merge, as has medicine, to develop research-based programs for specific target clinical problems.

Nursing biofeedback research has shown effective changes in patient symptoms through application of complementary techniques. A review of biofeedback or self-management training research by nurses before 1997 indicated favorable patient outcomes when performing management of stress symptoms, progressive relaxation, reduction of tension with electromyography training, hand warming, training during childbirth, respiratory training, and HRV training (Nakagawa-Kogan, 1994). These publications predominantly indicated individual efforts to inform the field of their respective specialized treatments. Over the years, there is very little shift to indicate that programs of care by nurses have proliferated. Although few biofeedback studies have been generated in nursing publications, there is evidence that more biofeedback research methods and physiological measurement feedback research articles have proliferated by faculty in nursing teaching programs, which are competitive in nonnursing journals. An example is the edited handbook of neurofeedback, with one of the authors as a second editor: *Introduction to Quantitative EEG and Neurofeedback: Advanced Theory and Applications* (Budzynski, Budzynski, Evans, & Abarbanal, 2008).

It is informative to point out the following: Chronic symptom patterns such as in advanced heart failure, sudden cardiac arrest, incontinence following surgery, chronic pain, nonhealing wounds, and elderly cognitive decline are symptoms that are frequently in the domain of care by nurses. Yet few nurses have ventured forth using validated skills and techniques to treat patients with these problems although the skills and the tools for practice are accessible and clearly in the realm of nursing practice. The following are some of the examples:

1. Advanced heart failure, even after open heart surgery and multiple stent procedures, chronic obstructive lung disease, and diabetic complications such as retinopathy can actually be reversed by offering compressed O^2 (through closed mask administration) while exercising (Linke et al., 2005; Moreno de Azevedo et al., 2010; Nguyen et al., 2004; Tsutsui et al., 2001; Ventura-Clapier, Mettauer, & Bigard, 2007). Oxygen starvation is well known to form the basis of death of cells through inability of cells to obtain nourishment as a result of reduced blood flow. The oxygen under pressure opens the arteries and capillaries and detoxifies the system through a broader and greater force of blood to the extremities of the body. This static would require a prescription by advanced registered nurse practitioners.

In lieu of compressed O^2 while exercising, the advanced registered nurse practitioner may prescribe the hyperbaric chamber for patients who cannot exercise. This chamber can infuse concentrated O^2 into various parts of the body to heal diabetic ulcers, generalized infections such as psoriasis, and chronic lung problems, to name a few conditions.

2. Chronic pain and nonhealing ulcers or wounds are treatable with many of the self-help microcurrent instruments that are currently available on the market. The current, issued at a microcurrent level of microamperes, provides a gentle but powerful change of polarity in tissues damaged and scarred by accidents, infections, toxicity, or aging. The small current, when applied to damaged areas, heals by opening the ion channels of the

> cells, releasing the toxins and restoring the adenosine triphosphate for the cells' nourishment. The science of microcurrent action is well documented in two research-grounded energy medicine books: *Energy Medicine: The Scientific Basis*, by James L. Oschman (2000), and *The Body Electric: Electromagnetism and the Foundation of Life*, by Robert Becker and Gary Selden (1985).

Physiological indicators with a psychological self-care orientation are used to demonstrate change. These previously mentioned studies are few in number, but recently the kinds and quality of noninvasive instrumentation on the market are allowing researchers to trace change in bodily and psychological processes—EEG, HRV, blood sugar levels, blood flow, CO_2, and respiratory activity, to name a few. The stage is set for offering feedback to any number of chronic problems heretofore neglected.

Helen Kogan Budzynski
Hsin-Yi (Jean) Tang

BOYKIN AND SCHOENHOFER: THE THEORY OF NURSING AS CARING

Boykin and Schoenhofer's theory of nursing as caring defines the essential nature of the discipline of nursing as "nurturing persons living caring and growing in caring" (2001, p. 12). Fundamental assumptions include the following: persons are caring by virtue of their humanness; persons are caring, moment to moment; persons are whole and complete in the moment; personhood is a process of living grounded in caring; personhood is enhanced through participating in nurturing relationships with caring others; and nursing is both a discipline and a profession (Boykin & Schoenhofer, 2001, p. 1).

The pivotal role of nursing is to nurture the developmental process of caring as growth toward self-actualization. Concepts central to the theory include the following: caring, characterized by recognition of value and connectedness between the nurse and the nursed (person who is cared for and about), promoting mutual respect and altruistic actions (Boykin & Schoenhofer, 2001); caring between a personal encounter connection between the nurse and the nursed "within which personhood is nurtured" (p. 14); and nursing situation, "a shared lived experience in which the caring between nurse and nursed enhances personhood" (p. 13).

The visual synthesis of the theory of nursing as caring, the *Dance of Caring Persons*, represents the active and the circular "dance-like" nature of caring grounded in respect for one another (the nurse and the nursed) as unique caring individuals in the process of growth (Boykin & Schoenhofer, 2001; Boykin, Schoenhofer, Smith, St. Jean, & Aleman, 2003). Valuing of all persons connecting within the dance inform ways of communicating and relating effectively with others (Boykin & Schoenhofer, 2001). The *Dance of Caring Persons* was developed as a model for building organizational effectiveness through enhancing collaboration, respect, and satisfaction of nurses and the nursed (health care customers; Boykin & Schoenhofer, 2006).

The development of caring health care practice environments is enhanced through the application of nursing as caring through story. The use of story provides a vehicle for the art of nursing to inform its practice. Sharing nursing situation through story reminds nurses of the richness of living caring within nursing practice and promotes the realization of self and others as "persons living caring and growing in caring" (Boykin & Schoenhofer, 2001, p. 12).

The theory of nursing as caring is described by Boykin and Schoenhofer (2001) as a general (grand) theory. The broad conceptual framework of nursing as caring serves as a catalyst for the development of middle-range theories addressing more specific phenomena of nursing as caring in the realms of nursing administration, practice, and education. Examples of middle-range theories on the basis of nursing as caring include the theory of technological competence as caring in the critical care nursing (Locsin, 1998), Dunphy's (1998) "circle of caring" model for advanced practice nursing, an acute care model grounded in the perspective of nursing as caring (Boykin et al., 2003), a model of nursing education with application to online education grounded in caring (Purnell, 2006), and the innovative approach of Eggenberger and Keller (2008) developing a nursing as caring model for nursing simulations.

Mary Angelique Hill

BREASTFEEDING

Breastfeeding provides nutritional, immunological, cognitive, and psychological benefits for young children. A burgeoning body of research has identified the unique properties and unreplicable living tissue transferred to infants and children through breastfeeding and the effect on health outcomes. A report from the Agency for Healthcare Quality and Research screened 9,000 studies in developed countries with a meta-analysis of the health impact of breastfeeding on infants and women. According to this report, infants who are breastfed had a reduced risk of acute otitis media, atopic dermatitis, gastrointestinal infections, lower respiratory tract disease, asthma, obesity, type 2 diabetes, childhood leukemia, and sudden infant death syndrome (SIDS). Mothers who breastfeed had a reduced risk of type 2 diabetes, breast cancer, and ovarian cancer (Ip et al., 2007). Documentation of the superiority of breastfeeding to the health and well-being of infants, children, and women has led to the recognition that breastfeeding is a health care behavior. National and international policies and recommendations from nongovernmental organizations, national governments, and medical organizations have been developed on the basis of compelling research and include the U.S. Department of Health and Human Services (2000) Healthy People 2010 goals, the U.S. Surgeon General's "Blueprint for Action on Breastfeeding" (Satcher, 2001), and the World Health Organization's Global Strategy for Infant and Young Child Feeding (World Health Organization/United Nations Children's Fund, 2003).

Historically, a large discrepancy exists in the United States between breastfeeding rates, especially according to income, education, race, and ethnicity (Ahluwalia, Morrow, Hsia, & Grummer-Strawn, 2003; Watkins & Dodgson, 2010). Nursing research has focused on meeting the needs of these vulnerable populations, recognizing that continuity of care and support systems, including health care professional support play a large role in women's success to breastfeed, their intended duration.

Major areas studied by nurse scholars include breastfeeding interventions (Ahmed & Sands, 2010; Pate, 2009; Spiby et al., 2009; Watkins & Dodgson, 2010), support for breastfeeding mothers (Declercq, Labbok, Sakala, & O'Hara, 2009; Kearvell & Grant, 2010; Nelson, 2007), maternal self-confidence (Hauck, Hall, & Jones, 2007; McCarter-Spaulding & Gore, 2009; Pollard & Guill, 2009), effect of pacifier use (Chapman, 2009; Declercq et al., 2009; Kronborg & Væth, 2009), effect of the Baby-Friendly Hospital Initiative on breastfeeding (Bartick, Stuebe, Shealy, Walker, & Grummer-Strawn, 2009; Duyan Çamurdan et al., 2007; Hannula, Kaunonen, & Tarkka, 2008; Merten, Dratva, & Ackermann-Liebrich, 2005; Reddin, Pincombe, & Darbyshire, 2007), postpartum depressions effect on infant feeding (Dennis & Kingston, 2008; Dennis & McQueen, 2009; Henderson, Evans, Straton, Priest, & Hagan, 2003), and ethnic diversity and low-income effect on breastfeeding (Bulk-Bunschoten, Pasker-de Jong, van Wouwe, & de Groot, 2008; Cricco-Lizza, 2006; Gill, 2009; Kelly, Watt, & Nazroo, 2006; McCarter-Spaulding & Gore, 2009; Racine, Frick, Guthrie, & Strobino, 2009; Ryan & Zhou, 2006).

Nurses need updated education on the basis of research to provide support to breastfeeding mothers at critical times (Dennis & Kingston, 2008; Hannula et al., 2008; Johnson, Mulder, & Strube, 2007; Kearvell & Grant, 2010; McInnes & Chambers, 2008; Nelson, 2007; Rêgo et al., 2009) and to identify women at risk for complications early on, for example, obesity as a risk factor in the mother or infant admission to the neonatal intensive care unit (Amir & Donath, 2007; Cohen et al., 2009; Cricco-Lizza, 2009; Jevitt, Hernandez, & Groër, 2007), so that interventions can be initiated and referrals made in a timely fashion to preserve the breastfeeding relationship. Nurses need to be aware of new developments on breastfeeding in areas such as breast reduction/augmentation surgery (Chamblin, 2006; Hurst, 2003; Souto, Giugliani, Giugliani, & Schneider, 2003), HIV status (Jackson, Goga, Doherty, & Chopra, 2009; Kuhn, Reitz, & Abrams, 2009), and drugs (Fortinguerra, Clavenna, & Bonati, 2009; Howland, 2009). Careful assessment of the benefits and risks of not breastfeeding should be in the forefront of nursing research. In addition, new growth charts provide more accurate data on breastfeeding infants' expected growth patterns, and clinicians have new resources in planning their care (Vesel et al., 2010).

Nurse scientists continue to use different methodologies to study breastfeeding and to identify some of the reasons for discrepancies in initiation, duration, and support, including ethnographies, phenomenological studies, historical-cultural approaches, and ecological perspectives. Theoretical frameworks used to explore the health behavior of breastfeeding include the theory of planned behavior, the health belief model, the social cognitive theory using the concept of self-efficacy, and the social-ecological frameworks. Nurses have conducted many meta-analyses of both quantitative and qualitative research in the area of breastfeeding. Researchers have demonstrated the importance of peer and social support, the effect of hospital interventions, the need for comprehensive breastfeeding education and support, the communication-related barriers, the socioeconomic issues, the effect of values and practice, and most importantly the culturally relevant issues that influence infant-feeding choices.

Clinical issues being explored by nurse scientists include the following: biological benefits of breastfeeding to the mother and infant, HIV and breastfeeding, lactation mastitis, breastfeeding in special circumstances, and positioning and attachment. The influence of the health care delivery system, community, and society/culture cannot be ignored.

Challenges related to the study of breastfeeding include three major areas: the lack of consistency in the definition of breastfeeding (e.g., exclusivity) making comparison of studies tedious if not impossible; the difficulty measuring cross-cultural effects (lack of reliability and validity studies of major breastfeeding instruments with various cultures); and the development of prospective designs and randomized controlled trials. We have made strides with meta-analyses, more theory-focused research, and better effort at defining breastfeeding and separating out the effects of exclusivity.

Although breastfeeding is now recognized as a right of mothers, a health care behavior contributing to the reduction of infant and maternal morbidity and mortality rates, less expensive than artificial milk supplementation and more environmentally friendly, the national breastfeeding goals are far from being met. Federal funding for breastfeeding research in the United States continues to demonstrate an incongruity with the national priorities for breastfeeding.

Only 13.7% ($5.6 million out of $40.4 million available) of federal research funds from 1994 to 1996 were awarded to projects having an impact on the Healthy People 2000 goals for increasing the incidence and duration of breastfeeding. In contrast, 27 projects (7.5% or $4.1 million) involved the use of human milk composition and technologies to improve artificial milks (Brown, Bair, & Meier, 2003). Recent cost analyzes demonstrate that if 90% of U.S. families with children were successful at exclusively breastfeeding for 6 months, the cost saving would be $13 billion per year (Bartick & Reinhold, 2010).

Suzanne Hetzel Campbell

C

Cancer in Children

Pediatric oncology represents only a small fraction of the discipline of oncology. Although relatively rare, childhood cancer causes considerable morbidity among those affected and is the leading cause of disease-related death among children ages 1 to 19 years (Martin et al., 2008). Yet the numerous advances in the diagnosis and treatment of childhood cancer have resulted in significant improvements in survival. Approximately 81% of all children diagnosed with malignant neoplasms will survive more than 5 years (Jemal, Siegel, Zu, & Ward, 2010).

The annual incidence of childhood cancer is 16.6 per 100,000 children ages 0 to 19 years (U.S. Cancer Statistics Working Group, 2010). There is a slightly higher incidence in men (17.5 per 100,000) compared with women (15.3 per 100,000). There are approximately 13,100 children and adolescents less than 20 years of age diagnosed each year with cancer (U.S. Cancer Statistics Working Group, 2010). For children of all ages, leukemia is the most frequent type of cancer, followed by brain tumors and lymphomas. Tumors of the kidney are more common in African Americans, whereas tumors of the brain and bone are more common in Caucasians.

The cause of childhood cancer is not known. Some childhood cancers, in particular retinoblastoma, Wilms tumor, and neuroblastoma, demonstrate patterns of inheritance that suggest a genetic basis for the disorder. Chromosome abnormalities have been found in acute leukemia and lymphoma as well as other pediatric solid tumors. Wilms tumor is associated with an increased incidence of congenital anomalies. Children with syndromes caused by abnormal numbers of chromosomes (i.e., Down syndrome) have an increased incidence of cancer (Lightfoot & Roman, 2004). Children with immune deficiencies are at greater risk for developing cancer. Some viruses have been linked to childhood cancer, such as hepatitis B virus associated with hepatocellular cancer in children and Epstein-Barr virus associated with the development of lymphoma. Despite the lack of knowledge about the origin of cancer, there is some information on risk factors that increase the likelihood of children developing cancer. Environmental agents such as exposure to ionizing radiation have been found to cause cancer in children (Lightfoot & Roman, 2004).

The major focus of pediatric oncology nursing research includes symptom assessment and management, end-of-life care, quality of life, and long-term survivorship issues (Hockenberry & Kline, 2010). Although increased attention on nursing research has occurred over the past 10 years, many areas of pediatric oncology nursing have yet to be explored. There is a significant need for further clinical research with a cultural and communication focus (Hare & Hinds, 2004). Qualitative research has been used more frequently to allow children with cancer to describe phenomenon that is not well understood; however, incorporating the pediatric patient as an active participant in all research studies is an important consideration for pediatric oncology nursing research (Hare, 2005).

Symptom assessment and management has been a focus of pediatric oncology nursing research for many years. In the 1980s, nursing research focused on procedure-related pain, treatment-related nausea and vomiting, and emotion-related symptoms (Hockenberry, 2004). To evaluate the status of the current research on symptom management in individuals with cancer, the National Institutes of Health (2002) held a State of the Science on Symptom Management in Cancer: Pain, Depression, and Fatigue. The review of existing research revealed that efforts to manage symptoms of cancer and its treatments have not kept pace with new advances in the causes and cures for cancer.

Priority areas of symptom management research include longitudinal and multidimensional studies to evaluate symptom distress, patient and parent studies to identify expectations of cancer-related symptoms, evaluation of pain management effectiveness, and evaluation of the presence of symptom clusters (Hockenberry, 2004). Hedstrom et al. (2003) discovered that the most common causes of distress in a group of 121 children with cancer were treatment-related pain, nausea, and fatigue. Woodgate and Degner (2003) evaluated expectations about childhood cancer symptoms in a group of 39 children and their family members and found that these individuals expected to experience suffering as part of the cancer treatment. The families felt that unrelieved or uncontrolled symptoms were necessary for cure. Studies evaluating pain management now focus on various pharmacological and nonpharmacological interventions; however, longitudinal studies evaluating the effectiveness of pain interventions over time are lacking. A relatively new area of symptom assessment research is the evaluation of symptom clusters and research efforts are initially focusing on identifying clinically significant symptom clusters and their prevalence rates (Miaskowski, Dodd, & Lee, 2004). A recent study of 67 children and adolescents receiving chemotherapy found that when fatigue, sleep disturbance, nausea, and vomiting were present, depressive symptoms and behavior changes occurred among the adolescents after chemotherapy treatment (Hockenberry et al., 2010).

As survival for childhood cancer continues to improve, nursing investigations are focusing on survivorship issues and quality of life after the diagnosis and treatment of cancer. A review of childhood cancer survivor studies showed that childhood cancer survivors who underwent radiation therapy reported more psychological distress, those who underwent chemotherapy treatment with anthracyclines or alkylating agents experienced more physical impairments, and those who had limb-sparing procedures reported more anxiety and more functional impairment than those who had an amputation (Zelter et al., 2009). Childhood cancer survivor studies have also documented the adverse effects of central nervous system treatment on cognitive, academic, and psychosocial functioning. Interventions designed to minimize the adverse effects of central nervous system therapy are now being conducted.

Docherty (2003) completed a review of the published literature on symptom experiences of children and adolescents with cancer. This review revealed no longitudinal symptom management study designs, limited use of conceptual models or theories, frequent adaptation of adult instruments as symptom measures, and no attention to the impact of these symptoms on the children's lives.

It is evident from the recent childhood cancer literature that there is still much to be gained from continued research. The importance of striving for symptom relief in children cannot be overemphasized. Recognition and acknowledgment of the beliefs and expectations of children and their parents regarding cancer-related symptoms (Woodgate & Degner, 2003) should continue to be a major research focus. Longitudinal studies evaluating the trajectory of symptom occurrence and symptom management over time are not found. Continued exploration of the most effective management and coping strategies should be pursued for children experiencing all types of cancer or treatment-related symptoms. Finally, utilization of research findings in the clinical setting is lacking. More innovative, creative methods for dissemination of our knowledge of symptom occurrence and symptom management must be explored. Evaluating feasibility and fidelity along with the effectiveness of an intervention during a study will allow for a more successful transition to real life settings (Breitenstein et al., 2010).

An ongoing effort to strengthen collaboration among staff nurses, advanced practice nurses, and nurse researchers is a priority. Designing and maintaining joint research relationships with other disciplines is essential to facilitate the development of scientific credibility of nurse-initiated protocols and pediatric oncology nurse investigator studies.

Marilyn Hockenberry
Cheryl Rodgers

CARDIOVASCULAR RISK FACTORS: CHOLESTEROL

Cardiovascular disease (CVD) is a major cause of disability and premature mortality in men and women in the United States, in the industrialized world, and in the majority of developing countries. Atherosclerotic-CVD processes begin early in life and are influenced over time by the interaction of genetic and potentially modifiable environmental factors including health-related lifestyle behaviors. Hypercholesterolemia—elevated serum total cholesterol (TC)—is recognized as an independent risk factor for coronary heart disease (CHD). Low-density lipoprotein cholesterol (LDL-C), the major atherogenic lipoprotein, typically constitutes 60% to 70% of serum TC and is the primary target of cholesterol-lowering therapy. In 1988, on the basis of available epidemiological and clinical data, the National Cholesterol Education Program (NCEP) Adult Treatment Panel (ATP) issued the first guidelines for identifying and managing hypercholesterolemia in adults. Since that time, results of numerous randomized controlled trials confirmed that lowering LDL-C was important in the primary and secondary prevention of CHD. The most recent revision of these guidelines (Executive Summary of the Third Report of the National Cholesterol Education Program, 2002), referred to as ATP III, continues to focus on LDL-C as the primary target of risk reduction therapy, considers other lipid and nonlipid risk factors, and emphasizes therapeutic lifestyle change (TLC) and pharmacological therapies for reducing individual risk and the public health burden of CHD. With continued emphasis on identification of individuals at risk and more attention to adherence-enhancing strategies, ATP III incorporates numerous roles for nurses and nursing across health care settings where lipid abnormalities are diagnosed and treated.

ATP III continues to define hypercholesterolemia as TC 240 mg/dl or greater (6.21 mmol/L) for individuals 20 years and older; TC levels of 200 to 239 mg/dl are considered borderline high, and less than 200 mg/dl is considered desirable. LDL-C levels are categorized as follows: very high (≥190 mg/dl), high (160–189 mg/dl), borderline high (130–159 mg/dl), above optimal (100–129 mg/dl), and optimal (<100 mg/dl). Results of several clinical trials suggested that LDL-C lowering beyond 100 mg/dl in secondary prevention (after an acute coronary event) was associated with improved cardiovascular outcomes, raised questions regarding the established cut points for LDL-C, and prompted a modification to the ATP III treatment algorithm (Grundy et al., 2004). Specifically, an LDL-C goal of less than 70 mg/dl is now considered a therapeutic option for patients at very high risk.

ATP III recommends a fasting lipoprotein profile (TC, LDL-C, high-density lipoprotein cholesterol, and triglyceride) should be obtained once every 5 years in adults 20 years or older. A basic principle of prevention is emphasized throughout ATP III: the intensity of risk-reduction therapy should be adjusted to an individual's absolute risk.

The Framingham projections of 10-year absolute CHD risk (i.e., the percent probability of having a CHD event in 10 years) are used to identify and risk stratify individuals. In addition to LDL-C, risk determinants include presence or absence of CHD and other clinical forms of atherosclerotic disease, cigarette smoking, hypertension (blood pressure ≥ 140/90 mm Hg or on antihypertensive medication), low high-density lipoprotein cholesterol (<40 mg/dl), family history of premature CHD, and age (men ≥ 45 years, women ≥ 55 years). The category of highest risk (10-year risk > 20%) includes CHD and CHD risk equivalents (other clinical forms of atherosclerotic disease, diabetes) and has a goal of LDL-C defined as less than 100 mg/dl. The intermediate risk category (10-year risk ≤ 20%) includes multiple (2+) risk factors and has a goal LDL-C as 130 mg/dl; the lowest risk category (10-year risk < 10%) includes 0 and 1 risk factors with an LCL-C goal of 160 mg/dl.

The cornerstone of treatment for hypercholesterolemia and other lipid abnormalities is TLC, with emphasis on dietary modification, increased physical activity, and normalization of body weight. The important components of the TLC diet are saturated fat (<7% of total calories), polyunsaturated fat (up to 10% of total calories), and monounsaturated fat (up to 20% of total calories). Less than 200 mg/day of dietary cholesterol, 50% to 60% of total calories from carbohydrates, and approximately 15% of total calories from protein are recommended. Other key components of the TLC diet include viscous fiber, plant stanols/sterols, and soy protein. Considerable variation in response to dietary modification has been observed in males and females across the life span. Variations in serum TC, for example (ranging from 3% to 14%), are attributed to individual differences in biological mechanisms, baseline TC levels, nutrient composition of baseline diets, and adherence over time to the prescribed dietary regimen. The first priority of pharmacological therapy is to achieve the appropriate LDL-C goal (as defined by the individual's category of risk). ATP III recommends the use of HMG-CoA reductase inhibitors (statins) as first-line therapeutic agents. In a meta-analysis of clinical trials, the average reduction in TC in more than 30,000 middle-aged men followed for more than 5 years was 20%, the average reduction in LDL-C was 28%, and the decline in triglyceride averaged 13% (LaRosa, He, & Vupputuri, 1999). Results of a landmark secondary prevention trial suggested that early and continued lowering of LDL-C with an intensive lipid-lowering (statin) regimen provides greater protection against death or major cardiovascular events than a standard regimen (Cannon et al., 2004). Other pharmacological agents currently used in treatment of dyslipidemia in adults include bile–acid binding resins, niacin, and fibrates. The decisions to initiate LDL-C-lowering drug therapy, the type and dosage of agent to be used, and the schedule for monitoring individual response to therapy are based on the individual's baseline risk status. Normally, the patient's response is evaluated approximately 6 weeks after starting drug therapy. Relatedly, TLC continues throughout (and beyond) the duration of pharmacotherapy.

Consistent with recommendations of the 33rd Bethesda Conference on preventive cardiology (Ockene, Hayman, Pasternak, Schron, & Dunbar-Jacob, 2002), ATP III identifies and targets adherence-enhancing interventions that consider the characteristics of the individual patient, the provider, and the systems of health care delivery. Case management by nurses within the context of multidisciplinary team approaches is considered an integral component of increasing adherence to therapeutic regimens for hypercholesterolemia and other lipid abnormalities.

The NCEP has not revised the 1991 definitions and guidelines for management of hypercholesterolemia in children and adolescents in the United States; however, the American Heart Association's (AHA) guidelines for primary prevention (Kavey et al., 2003) and the American Academy of Pediatrics (AAP) recent recommendation (Daniels & Greer, 2008) are consistent with NCEP definitions: acceptable TC (<170 mg/dl; 4.4 mmol/L), borderline TC (170–199 mg/dl), and elevated TC (≥200 mg/dl). Similar to adults, both lipid and nonlipid risk factors are addressed, LDL-C levels are targeted as the basis for treatment decisions, and TLC is the cornerstone of treatment. LDL-C levels 110 mg/dl or less are considered acceptable for children and adolescents without comorbidities; LDL-C less than 100 mg/dl is recommended for children and adolescents with diabetes. An important pharmacological modification in treatment recommended by AAP (Daniels & Greer, 2008) and the AHA (McCrindle et al., 2007) focuses on timing of initiation and class of lipid-lowering agents. Specifically, current recommendations emphasize TLC as cornerstone of treatment; however, if an adequate trial of TLC does not result in target goals (LDL-C is persistently >190 mg/dl with no other risk factors; LDL-C is persistently >160 mg/dl with family history of premature heart disease or ≥2 other risk factors; and LDL-C ≥130 mg/dl in the setting of diabetes), pharmacological treatment beginning at 8 years and older should be considered. On the basis of accumulated safety and efficacy data, the AHA recommends that statins be considered as the first line of drug treatment.

Assessment and management of hypercholesterolemia and other lipid abnormalities is an important component of both individual/high risk and population-based approaches to CVD risk reduction. Current evidence-based guidelines, including ATP III, the AHA primary prevention guidelines for children and youth, and the AAP recommendations for lipid screening and cardiovascular health in childhood, consider both lipid and nonlipid risk factors, target LDL-C in algorithms for assessment and treatment considerations, and emphasize TLC as the cornerstone of treatment. Therapeutic regimens including pharmacotherapy and TLC are based on the individual's risk status; treatment outcomes are optimized with case management by nurses within the context of a multidisciplinary team approach. Directions for future research build on and extend current programs of nursing and multidisciplinary research focused on innovative models for primary and secondary prevention of CVD across the life span and with emphasis on both quality and cost as outcomes (Allen & Dennison, 2010; Berra, Miller, & Fair, 2006; Fletcher et al., 2005; Ma et al., 2009). In addition, current recommendations emphasize family-based approaches to CVD risk reduction (Hayman et al., 2007); however, minimal data exist regarding strategies for effective implementation in clinical practice.

Laura L. Hayman

CAREGIVER

Caregiver is defined as an individual who assists ill person(s), often helps with a patient's physical care, typically lives with the patient, and does not receive monetary compensation for the help. Also, a caregiver is a person who not only performs common caregiver responsibilities (i.e., providing physical, social, spiritual, financial management, and complex home care) but also advocates for the ill person within health care systems and society as a whole (National Family Caregivers Association, 2009). The caregiver's role is often expected in relation to one's elders, yet rarely is there preparation for caregiving for one's child or one's spouse.

Direct patient care encompasses much more than physical care; it also necessitates learning an extensive amount of information about illness, symptoms, medications, technological treatments, and how to relate to health care professionals (Smith, 1995;

Wilkins, Bruce, & Sirey, 2009). Caregivers also must be prepared for emergencies and be capable of responding appropriately. Usually, the caregiver must also manage their personal responsibilities, whether as a breadwinner, a housekeeper, or both. The caregiver's relationship with the patient, the caregiver's age and life developmental stage, the patient's illness severity, and the suddenness and amount of the change in the patient's need for caregiving have been predictive of caregiver burnout in various illness populations, such as chronic obstructive pulmonary disease (Caress, Luker, Chalmers, & Salmon, 2009), kidney disease (Tong, Sainsbury, & Craig, 2008), heart failure (Bakas, Pressler, Johnson, Nauser, & Shaneyfelt, 2006; Molloy, Johnston, & Witham, 2005; Pressler et al., 2009), and stroke survivors (Rigby, Gubitz, & Phillips, 2009). The indirect familial caregiver tasks include designating others to assist with patient care, exchanging information, maintaining decision making among appropriate persons, and coping with psychosocial stressors (Whitlatch, 2008).

Because the caregiver by definition is laden with tasks and expectations, the major area of research has been caregiver burden and negative outcomes on caregivers' physical, mental, and financial health (Piamjariyakul et al., 2010; Schulz & Sherwood, 2008; Smith, Piamjariyakul, Yadrich, Ross & Gajewski, 2010). The majority of burden studies have been descriptive and correlational and have resulted in identification of multiple factors recognized as being significant problems: complexity of the care needed by the patient that is often measured as illness demands. Numerous variables (e.g., demographic information, developmental stage, social support) that have been studied in relation to caregiver experience are influential yet not universally predictive of caregiver burden (Biegel, Sales, & Schulz, 1991). Research across disciplines identifies significant negative health outcomes of caregiving (reduced physical function, immune status, wound healing, greater fatigue, mortality, and cardiovascular disease; Beach, Schultz, Yee, & Jackson, 2000; Federal Interagency Forum on Aging, 2000; Given & Given, 1998; Schulz & Sherwood 2008; Silver & Wellman, 2002; Silver, Wellman, Galindo-Ciocon, & Johnson, 2004). In addition, the majority of caregivers experience depression, social isolation, financial strain, sleep deprivation with daytime sleepiness, and inefficient use of family resources (Smith, 1996).

Smith's (1994) research indicated caregivers' motives for helping consistently explain the variance in their depression, coping, and quality of life (Smith, Kleinbeck, Boyle, Kochinda, & Parker, 2002). In another clinical trial (Smith, 2006), Smith et al. (2010) reported significant relationships among family income adequacy and patients' and caregivers' quality of life as well as patients' clinical outcomes and caregivers' mental health. Qualitative data supported these findings that economic stress was the strongest factor affecting quality of life of patients and caregiver (Smith et al., 2010). This finding was consistent and confirmed the Smith's (1994) family home caregiving model, which was replicated across two decades (Smith, 1999; Smith et al., 2002; Winkler, Ross, Piamjariyakul, Gajewski, & Smith, 2006). In each model, caregiver characteristics of esteem, depression, and physical and mental health and in the context of caregiving (e.g., family income adequacy) have predicted patient outcomes (Smith, 2007; Smith, Leenerts, & Gajewski, 2003).

Problem-solving ability is lauded as essential and the caregiver's ability to solve problems can avert patient problems (National Family Caregivers Association, 2002; Schulz, 2000), yet only a handful of studies on problem solving in caregiving were found. Unique research on the positive aspects of caregiving is being conducted by Smith (2007) under the concept of caregiving effectiveness. Effective caregiving is defined as family provision of technical, physical, and emotional care that results in optimal patient health and quality of life and minimal technological side effects while maintaining the caregiver's health and quality of life (Smith, 1994). Nursing interventions have been found efficacious for caregiver problems of depression, sleep deprivation, social isolation, and lack of access to evidence-based information, caregiving, and complex technology problem solving (Smith, Curtas, et al., 2003; Smith, Dauz, Clements, Werkowitch, & Whitman, 2009; Smith et al., 2006). These interventions include counseling, peer support, high-quality Internet information, and contacts with experts. There is a dearth of research on caregiving with lifelong technology dependence that begins unexpectedly in middle life (when teenagers and elder family members also need assistance) and continues on a trajectory of intermittent disease exacerbations and slow, progressive decline (Winkler et al., 2006).

Traditional education such as verbal instruction at discharge does not ensure that caregivers will be able to understand and integrate home care management activities into daily routines (Albert, 2008; Clark et al., 2009). Telehealth and Web-based support in the homes are other interventions providing caregivers support (Piamjariyakul, Schiefelbein, & Smith, 2006; Piamjariyakul & Smith, 2008; Smith, 2007). In two recent studies, family caregivers requested information on the most challenging aspects of providing home care for chronically ill patients: dealing with patients' dietary restrictions, monitoring signs and symptoms, and obtaining information from health care providers (Pressler et al., 2009; Wilkins et al., 2009). The most widely recommended clinical yet unverified approach is to provide guidelines to manage specific caregiving problems (Schulz, Lustig, Handler, & Martire, 2002). Step-by-step guidelines (including computer algorithms) can guide systematic thinking and develop skills for solving stressful caregiving problems and communicate with their health care providers (Given, Sherwood, & Given, 2008; Smith, 2010a, 2011; Smith & Blanchard, 2011; Smith et al., 2010). The state of the science report on computer-based algorithms that aid patients to make step-by-step decisions about treatment options concluded that improved knowledge, attitudes, and lower health services used resulted from patients' use of algorithms (Agency for Healthcare Policy and Research, 1998; Agency for Healthcare Research and Quality, 2010). The Cochrane review and the randomized trial results concur, adding that patients with step-by-step decision aids had realistic treatment expectations, satisfaction with care, and lowered anxiety (O'Connor et al., 2002). The more successful problem-solving algorithms included logical, easily remembered steps, multiperspective (psychological and physical) information, long-term access, and booster repetition, all tailored to a specific group with common problems (Piamjariyakul et al., 2006; Smith, Koehler, Moore, Blanchard, & Ellerbeck, 2005).

Research should continue on the culturally related aspects of caregiving strategies used in various ethnic groups (Dilworth-Anderson et al., 2005; Dilworth-Anserson, Williams, & Gibson, 2002; Evans, Crogan, Belyea, & Coon, 2009). Another contemporary focus in caregiving research should be the caregiving family, as research has clearly indicated that multiple members of families are involved in providing direct and indirect care, both to the patient and in support of the primary caregiver (Smith, 1996). In addition to the caregiving family, the caregiving neighborhood or parish should be a focus of study. With appropriate outreached intervention program, the "out-of-home caregivers" can help provide a low-cost health care support to the patients such as monitoring symptoms, improving treatment adherence, prescribed diet, and lifestyle changes (Kalra et al., 2004; Piette et al., 2008).

Historically, research on the topic of caregivers has come from the literature on aging in which burden and supportive interventions have been studied (Tong et al., 2008). Interventions tested include teaching mastery of caregiving tasks, social interventions such as support groups or telephone contacts, and direct clinical services such as counseling and respite care. Outcomes of many of these intervention studies indicated that in the short term, the interventions may reduce caregiver stress in a limited way but the burden returns when the interventions cease (Smith, 2008). Given the escalating involvement of informal caregivers and high costs of chronic illness care, interventions with the potential for improving caregiver daily home care management and improving patients' outcomes (i.e., reducing rehospitalizations) must be tested.

Ubolrat Piamjariyakul
Carol E. Smith

CARING

Caring has been identified as a central concept in the discipline of nursing (Cowling, Smith, & Watson, 2008; Newman, Sime, & Corcoran-Perry, 1991; Newman, Smith, Dexheimer-Pharris, & Jones, 2008; Smith, 2010a, 2011; Smith & Blanchard, 2011). These authors have asserted that the discipline of nursing focuses on the study of the relationship of caring to human health. Caring is also essential to nursing practice, for without caring, true nursing practice does not exist. In the past 30 years, theory and research on caring have grown significantly, contributing to the emergence of a substantive body of knowledge referred to as caring science. Although criticism has been levied against this body of literature for its lack of conceptual clarity (Paley, 2001), there is growing international consensus in the discipline that knowledge about caring is the key to understanding human health, healing, and quality of life (Watson & Smith, 2002). On the basis of an analysis of the literature, Morse, Solberg, Neander, Bottorff, and Johnson (1990) elaborated five perspectives of caring in nursing as follows: a human trait, a moral imperative, an affect, an interpersonal interaction, and a therapeutic intervention. In another analysis of caring theory, Boykin and Schoenhofer (1990) argued for a multidimensional approach integrating ontological (meaning of caring), anthropological (meaning of being a caring person), and ontical (function and ethic of caring) perspectives. Watson (2005) defined caring as an ontology, a way of being, or a quality of consciousness that potentiates healing. She also defined caring as an ethic or moral imperative for relating with the other in which the humanity of the person is preserved. Swanson (1991) defined caring as "a nurturing way of relating to a valued other toward whom one feels a personal sense of commitment and responsibility" (p. 165). She identified five processes by which caring is enacted: knowing, being with, doing for, enabling, and maintaining belief. Smith (2001) argued that the meaning of caring as a concept is defined by the theory in which it is situated. She described a unitary view of caring as manifesting intentions, attuning to dynamic flow, appreciating pattern, experiencing the infinite, and inviting creative emergence.

Several trends have accelerated interest in the phenomenon of caring in nursing. Hospitals with or seeking Magnet ™ status have adopted caring-based frameworks to guide nursing practice. The International Caritas Consortium has been developed as a network of hospitals and practitioners committed to advancing Watson's theory-based model in practice (http://www.watsoncaringscience.org/icc/index.html). Several hospitals in South Florida are implementing Boykin and Schoenhofer's (2001) nursing as caring model. The importance of caring to a culture of safety is being explored by some scholars (Swanson & Wojnar, 2004). Others (Duffy & Hoskins, 2003; Ray, 1989; Turkel, 2001; Valentine, 1997) have examined the relationship between economics and caring, asserting and supporting that caring and attention to the economics of healthcare are not mutually exclusive and that caring-based nursing practice can result in positive economic outcomes. Theoretical and empirical work in caring is expanding. Grand theories (Boykin and Schoenhofer, 2001; Leininger & McFarland, 2006; Watson, 2008a, 2008b) and middle-range theories (Duffy & Hoskins, 2003; Locsin, 2001; Ray, 1989; Smith, 2010; Swanson, 1991) are focused on explicating the nature and dynamics of care and caring.

Three reviews of the research literature on caring have been published. Swanson (1999) summarized and categorized the research related to caring in nursing science, and Sherwood (1997) reported a meta-synthesis of the qualitative research on caring. Smith (2004) reviewed the research related to Watson's theory of human caring. Many different designs and methods have been used to investigate caring, including descriptive qualitative designs, surveys, phenomenology, and quasi-experimental designs using standardized scales and physiological measurement.

Swanson (1999) reviewed 130 data-based articles, chapters, and books on caring published between 1980 and 1996. The studies were categorized into five levels: capacity for caring (characteristics of caring persons), concerns and commitments (beliefs or values that underlie nursing caring), conditions (what affects, enhances, or inhibits the occurrence of caring), caring actions (what caring means to nurses and clients and what it looks like), and caring consequences (outcomes of caring). In her summary of 30 qualitative studies that described outcomes of caring and noncaring relationships, Swanson found that outcomes of caring for the recipients of care were emotional and spiritual well-being (dignity, self-control, and personhood), enhanced healing, and enhanced relationships. Consequences of noncaring were humiliation, fear, and feeling out of control, desperate, helpless, alienated, and vulnerable. Nurses who care report a sense of personal and professional satisfaction and fulfillment, whereas noncaring is related to outcomes of becoming hardened, oblivious, depressed, frightened, and worn down. Haldorsdottir's (1991) research led to a classification of levels of caring relationships related to a continuum of health or vitality; abusive relationships were classified as biocidic, cold and detached as biostatic, apathetic ones as biopassive, benevolence and kindness as bioactive, and transpersonal caring relationships as biogenic or life giving.

Sherwood's (1997) meta-synthesis of 16 qualitative studies revealed four patterns of nurse caring: interaction, knowledge, intentional response, and therapeutic outcomes. Caring was defined within content, context, process, and therapeutic or healing outcomes. Two types of caring knowledge and skills were identified as person-centered and technical-physical.

Smith (2004) reviewed 40 studies published between 1988 and 2003 that focused specifically on Watson's theory of transpersonal caring. Four major categories of research were identified: nature of nurse caring, nurse caring behaviors as perceived by clients and nurses, human experiences and caring needs, and evaluating outcomes of caring in nursing practice and education. The largest number of studies focused on nurse caring behaviors as perceived by clients or nurses. An expanding area of research related to evaluating outcomes of caring. Research supports that caring-based activities impact mood following miscarriage, patient satisfaction, pain and symptom distress in patients with cancer, well-being, and even blood pressure.

Watson's (2008a, 2008b) compendium of instruments to assess and measure caring is an important contribution toward the advancement of research. This text provides background on more than 20 instruments, citations of work in which they were used, and a copy of them. Some of these tools are as follows: (a) Larson's CARE-Q to measure perceptions of nurse caring behavior, (b) Wolf's Caring Behaviors Inventory to measure the process of caring, (c) Cronin and Harrison's Caring Behavior Assessment Tool and Duffy's Caring Assessment Tool to measure patient perceptions of nurse caring behaviors,

(d) Nyberg's Caring Attribute Scale to measure caring attributes, and (e) Coates' Caring Efficacy Scale to measure the belief in the ability to express a caring orientation and to develop caring relationships.

The future of research in caring is promising. An international community of scholars is actively building knowledge in caring science. The International Association for Human Caring meets annually to disseminate the work of its members, and the *International Journal in Human Caring* publishes research and scholarship that expands caring science. The Watson Caring Science Institute and the Anne Boykin Institute for the Advancement of Caring in Nursing have been established to support the scholarly development, dissemination, and application of knowledge related to caring. Scholars are examining the transtheoretical linkages between caring theories and other nursing conceptual systems (Watson & Smith, 2002). Important research questions center on the relationship between caring and healing outcomes, the qualities of a caring consciousness, the ontological competencies and types of nursing therapeutics that are caring based, and the types of environments and communities that facilitate caring. Nursing is the discipline that is studying the relationship between caring relationships and healing. Research needs to move beyond examining caring in nurse–patient relationships to caring relationships with family, friends, animals, nature, and the Divine and how these relationships affect health outcomes. It will be important to study both caregiver and recipient outcomes of caring theory-based models of practice in different settings. Swanson (1999) offered several suggestions for future research related to caring: developing measures of caring capacity, examining the effects of nurturing and experience on caring capacity, identifying and measuring the competing variables that may confound the links between caring actions and their outcomes, moving from studying the individual as unit of analysis to studying aggregates, and developing clinical trials to test the effectiveness of caring-based therapeutics in promotion of health and well-being. Different designs and methods must be used to capture the emerging questions in the field. Multiple ways of knowing from empirics to aesthetics are required to explore all dimensions of caring phenomena. A model of research that integrates these multiple perspectives and ways of knowing may be the preferred epistemological model for studying caring (Quinn, Smith, Ritenbaugh, Swanson, & Watson, 2003).

Marlaine C. Smith with contributions from Sally Phillips (Volume 1)

CASE STUDY AS A METHOD OF RESEARCH

Although case study as a research approach has been used in nursing and the social sciences for decades, there is little clarity about case study methodology. It is described by some as a research method or strategy (Jones & Lyons, 2004; Yin, 2003), a method of data collection (Gangeness & Yurkovich, 2006; Lincoln & Guba, 1985), a research design (Bergen & White, 2000), and a technique for teaching (Henning, Nielsen, & Hauschildt, 2006). Stake (1995) considers the case as the unit of study rather than a methodologic choice. Although there is lingering confusion about case study, most experts agree that case study is a way to describe, to explore, to understand, and to evaluate a phenomenon within the context in which it occurs (Anthony & Jack, 2009; Stake, 1995; Yin, 2003). In addition, it is a valuable tool to explore the transition between theory and practice.

The earliest use of case study was as a teaching technique reported in 1870 at Harvard Law School (Garvin, 2003). From there, it spread to other disciplines such as business, medicine, and nursing. Case study as a teaching technique used problem solving in the transition between theory and practice and has been used in nursing since the early 1900s (Parsons, 1911). Case studies were commonly reported in nursing 40 to 50 years ago (Burns & Grove, 2007) but fell out of favor as nursing struggled to be recognized as a science. There has been renewed interest in case study as an approach to constructivist inquiry (Anthony & Jack, 2009).

Case study research design can be quantitative; but because of the narrative nature of the case study itself, it is most often used as a qualitative research method. Case studies can be as simple as a single, brief case or very complex, examining a large number of variables. Case study is also used for theory generation and hypothesis testing. Qualitative case study method is often used as an adjunct method in an otherwise quantitative study. It is used this way for "in-depth study of meaningful characteristics of real-life events" (Anthony & Jack, 2009, p. 1175). Case study is a method that is appropriate with research that is flexible in epistemology, ontology, methodology, and strategies of inquiry (Denzin & Lincoln, 2000).

In nursing, case study design is used to study the complexities of nursing practice (Casey & Houghton, 2010). Case study is an intensive systematic study of an entity or entities about which little is known and conducted within the context of the real-life situation. The common characteristics of case studies include the following: the use of theory to guide data collection and analysis; the use of multiple sources of data and triangulation, applicable when the boundaries between context and phenomenon are unclear; and there are more variables than data points (LoBiondo-Wood & Haber, 2006). Case studies can be exploratory, descriptive, interpretive, experimental, or explanatory (Yin, 2003). The level of analysis also varies from factual or interpretive to evaluative (Lincoln & Guba, 1985). The unit of analysis is the case, which can be a single person, family, community, or institution (Burns & Grove, 2007).

Case study is used to expand understanding of phenomena about which little is known. The data can then be used to formulate hypotheses and plan larger studies. Other purposes of case study include theory testing, description and explanation. For example, the intensive analysis involved in case study is appropriate to answer questions of explanation, such as why participants think or behave in certain ways. The case study approach can also be used when a problem has been identified and a solution needs to be found all within the context of the current "real-life" situation.

The research process for case study design is similar to the techniques used in other designs. First, the purpose, the research questions, and the propositions are developed. Questions of what, how, and why are appropriate for case study designs. The propositions of the study are often statement of expected outcomes that resemble a hypothesis. The propositional statements are supported or rejected after the data are analyzed (Gangeness & Yurkovich, 2006). A theoretical framework may be used to guide the case study. This will help to identify assumptions that the researcher may have about the phenomenon at the beginning of the study.

At the outset of the study, the unit of analysis must be clearly delineated. The unit of analysis can be an individual, a family, an organization, or an event. Clearly identifying the unit of analysis has implications for the data collection and the study protocol. The protocol should list how participants will be recruited and what constitutes data (documents, letters, interviews, field observations, etc.). The protocol should also identify what resources will be needed and a tentative time line for data collection. Modifications can be made in the protocol as the study progresses and the problems emerge. The protocol should also identify the plan for data analysis and how the data will be reported.

Case study design can be a single-case design or a multiple-case design. Single-case designs are used when a case represents a typical, extreme, critical, unique, or revelatory case (Yin, 2003). When the purpose of the study is theory generation, a multiple-case design is appropriate. Multiple-case design draws inferences and interpretations from a group of cases. The multiple-case design is also useful to add depth to explanatory and descriptive studies.

Data for case study can be qualitative or quantitative and often includes both in the same study depending on the research question. Data from multiple sources, archival data, field notes, interview tapes (audio or video), direct observation, participant observation, logs, documents, and narratives generate a comprehensive and rich case study. Every source of data has strengths and weaknesses, but when used together the benefits of each combine to diminish the weaknesses and strengthen the outcome.

Data analysis in case study is guided by the propositions and the type of data. Qualitative data analysis techniques, content analysis, analytic induction, constant comparison, and phenomenological analysis are used in case study depending on the type of data and research question. Planned case studies are generally analyzed using pattern matching because the multiple sources of data contribute to similar phenomena (Gangeness & Yurkovich, 2006). Because there are no fixed formulas for analyzing qualitative data, the researcher's own rigorous thinking is paramount, giving consideration to alternative interpretations (Yin, 2003). If data are quantitative in nature, analysis is similar to any quantitative study and is dependent on the research question.

Case study reports are presented in a variety of ways, from formal written narratives to creative montages of photographs, videotape, and arts and craft work. Most case study reports in nursing are formal written narratives appearing in peer-reviewed journals. There are no rules or standardized ways to write a report, but most case studies include an explanation of the problem or issue and a detailed description of the context and processes surrounding the phenomenon under investigation. A discussion of the results is also included in the reports, which can contain inferences about how these results fit with the existing literature and practice implications.

The standard measures of reliability and validity apply to case studies that are quantitative. The criteria developed by Lincoln and Guba (1985) are used to evaluate qualitative case studies. When a study meets the criteria for credibility, transferability, dependability, and confirmability, it is considered to be trustworthy (reliable and valid). Credibility of the interpretations is supported by techniques such as triangulation of data collection methods, negative case analysis, and checking the interpretation with the participants themselves. Transferability (generalizability) is an indication of whether the findings or conclusions of the study fit in other contexts and fit with the existing literature. When another person is able to follow the researcher's audit trail or the process and procedures of the inquiry, then the study is considered to be dependable. Confirmability is achieved when the results, conclusions, and recommendations are supported in the data and the audit trail is evident.

Case study method is a comprehensive research strategy used to examine phenomena of interest to nursing within the real-life context. As a method, it has survived the positivist debate and is being used more often in nursing. On the basis of the fact that case studies are reported almost exclusively in peer-reviewed journals (benchmarks of quality), it can be stated that case study is an accepted research method/design in nursing. An ongoing challenge to the utility of case study as a research method in nursing is the continued debate and lack of clarity in what case study actual is. Case study method fits with the current trend in inquiry that supports flexibility in epistemology, ontology, methodology, and research strategy (Denzin & Lincoln, 2000).

Debera Jane Thomas

CAUSAL MODELING

Causal modeling refers to a class of theoretical and methodological techniques for examining cause-and-effect relationships, generally with nonexperimental data. Path analysis, structural equation modeling, covariance structure modeling, and LISREL modeling have slightly different meanings but often are used interchangeably with the term causal modeling. Path analysis usually refers to a model that contains observed variables rather than latent (unobserved) variables and is analyzed with multiple regression procedures. The other three terms generally refer to models with latent variables with multiple empirical indicators that are analyzed with iterative programs such as LISREL or EQS. A common misconception is that these models can be used to establish causality with nonexperimental data; however, statistical techniques cannot overcome restrictions imposed by the study's design. Nonexperimental data provide weak evidence of causality regardless of the analysis techniques applied.

A causal model is composed of latent concepts and the hypothesized relationships among those concepts. The researcher constructs this model a priori on the basis of theoretical or research evidence for the direction and sign of the proposed effects. Although the model can be based on the observed correlations in the sample, this practice is not recommended. Empirically derived models capitalize on sample variations and often contain paths that are not theoretically defensible; findings from empirically constructed models should not be interpreted without replication in another sample.

Most causal models contain two or more stages; they have independent variables, one or more mediating variables, and the final outcome variables. Because the mediating variables act as both independent and dependent variables, the terms *exogenous* and *endogenous* are used to describe the latent variables. Exogenous variables are those whose causes are not represented in the model; the causes of the endogenous variables are represented in the model.

Causal models contain two different structures. The measurement model includes the latent variables, their empirical indicators (observed variables), and the associated error variances. The measurement model is based on the factor analysis model. A respondent's position on the latent variables is considered to cause the observed responses on the empirical indicators, so arrows point from the latent variable to the empirical indicator. The part of the indicator that cannot be explained by the latent variable is the error variance generally due to measurement.

The structural model specifies the relationships among the latent concepts and is based on the regression model. Each of the endogenous variables has an associated explained variance, similar to R^2 in multiple regression. The paths between latent variables represent hypotheses about the relationship between the variables. The multistage nature of causal models allows the researcher to divide the total effects of one latent variable on another into direct and indirect effects. Direct effects represent one latent variable's influence on another that is not transmitted through a third latent variable. Indirect effects are the effects of one latent variable that are transmitted through one or more mediating latent variables. Each latent variable can have many indirect effects but only one direct effect on another latent variable.

Causal models can be either recursive or nonrecursive. Recursive models have arrows that point in the same direction; there are no feedback loops or reciprocal causation paths. Nonrecursive models contain one or more feedback loops or reciprocal causation paths. Feedback loops can exist between latent concepts or error terms.

An important issue for nonrecursive models is identification status. Identification status refers to the amount of information (variances and covariances) available compared with the number of parameters that are to be estimated. If the amount of information equals the number of parameters to be estimated, the model is "just identified." If the amount of information exceeds the number of parameters to be estimated, the model is "overidentified." In both cases, a unique solution for the parameters can be found. With the use of standard conventions, recursive models are almost always overidentified. When the amount of information is less than the number of parameters to be estimated, the model is "underidentified" or "unidentified," and a unique solution is not possible. Nonrecursive models are underidentified unless instrumental latent variables (a latent variable for each path that has a direct effect on one of the two latent variables in the reciprocal causation relationship but only an indirect effect on the other latent variable) can be specified.

Causal models can be analyzed with standard multiple regression procedures or structural equation analysis programs, such as LISREL or EQS (see *Structural Equation Modeling*). Multiple regression is appropriate when each concept is measured with only one empirical indicator. Path coefficients (standardized regression coefficients, β) are estimated by regressing each endogenous variable on the variables that are hypothesized to have a direct effect on it. The fit of the model is calculated by comparing total possible explained variance for the just identified model with the total explained variance of the proposed overidentified model. Data requirements for path analysis are the same as those for multiple regression: (a) interval or near-interval data for the dependent measure; (b) interval, near-interval, or dummy-coded, effect-coded, or orthogonally coded categorical data for the independent measures; and (c) 5 to 10 cases per independent variable. Assumptions of multiple regression must be met.

In summary, causal modeling techniques provide a way to more fully represent the complexities of the phenomenon, to test theoretical models specifying causal flow, and to separate the effects of one variable on another into direct and indirect effects. Although causal modeling cannot be used to establish causality, it provides information on the strength and direction of the hypothesized effects. Thus, causal modeling enables investigators to explore the process by which one variable might affect another and to identify possible points for intervention.

JoAnne M. Youngblut

CEREBRAL ISCHEMIA

Cerebral ischemia is defined as inadequate blood flow to the brain to meet metabolic and nutritive needs of the brain tissue (Edvinsson, MacKenzie, & McCulloch, 1993). The severity of ischemia depends on the severity and duration of the reduction in cerebral blood flow (CBF) adversely affecting various functional and metabolic processes as CBF decreases (Heiss & Rosner, 1983). The brain stores no oxygen and little glucose and is thus dependent on a constant supply of oxygen and glucose from the blood.

Cerebral ischemia may be focal or global, depending on whether a part of the brain or the entire brain is ischemic. Focal cerebral ischemia occurs when a major cerebral artery becomes occluded or constricted from arterial spasm, emboli, or thrombosis. Global ischemia occurs from an overall decrease in CBF, for example, after cardiac arrest. Global oxygen deprivation of the brain may also occur as a result of asphyxia, anemia, hypoxia, or near drowning. Nurses are responsible for identifying individuals at risk for focal or global cerebral ischemia. Nursing assessment of early symptoms of cerebral ischemia can allow for intervention and minimize the probability of permanent damage.

Spielmeyer first described “ischemic cell change” in 1922 (Spielmeyer, 1922), and Brierley presented the time course for neuronal change during a low-flow state and provided evidence of the threshold for cerebral anoxic ischemia (Brierley, Brown, & Meldrum, 1971; Chiang, Kowada, Ames, Wright, & Majno, 1968). He observed and described in further detail the process of ischemic cell change (Brierley, 1973). With the initial decrease in blood flow, oxygen, and/or glucose to the brain, the contour of cells, nucleus, and nucleolus remain unchanged. There is disruption of mitochondria and an increase in the astrocyte processes surrounding the neurons. As the ischemic process continues, there is neuronal shrinkage, changes within organelles in the cytoplasm, and the cell is further surrounded by astrocytic processes. As the nucleus continues to shrink and the cytoplasm becomes more amorphous, incrustations begin to form. Finally, as the incrustations disappear and the cytoplasm becomes increasingly homogeneous, astrocytes proliferate and lipid phagocytes form in preparation for removal of the now “ghost cell.” As the flow lowers and the mitochondria fail, energy sources change from an aerobic to an anaerobic pathway, with a corresponding increase in lactic acid production, metabolic derangement, and loss of ion and transmitter homeostasis. If this process continues unchecked, there will be inadequate energy to maintain the sodium potassium pump across the cell membrane (Jones et al., 1981). Researchers have increasingly detailed the process in an attempt to identify and improve the brain’s tolerance to recover from an ischemic challenge.

Servetus, in the sixteenth century, first presented the idea that blood flowed through the lungs; he was burned at the stake for his efforts. William Harvey (1578–1657) supported Servetus’ findings by describing the flow of blood through the body. Nearly 200 years later, oxygen was discovered by Priestley, and Steele and Lavoisier made the connection that oxygen contributed to the production of “heat” or energy. Adolf Fick (1870) defined blood flow as the quantity of a substance, such as oxygen, that is taken up by a specific organ over a unit of time (Obrist, 2001). The first “measures” of CBF involved direct and indirect observations of intracranial vessels (Roy & Sherrington, 1890). It was not until 1945, when Kety and Schmidt applied the Fick principle to diffusible gas, nitrous oxide, that one was able to estimate CBF (Kety, 1950; Kety & Schmidt, 1948).

Kety was the first person to measure global CBF in humans using vascular transit time. The technique was modified by Lassen and Ingvar (1972) when Xe-133, a highly diffusible gas, was injected into the internal carotid artery. Multiple extracranial detectors traced the transit time of the radiation from the Xe-133 as it flowed through the brain, providing focal CBF measures. Diffusible tracers are now combined with tomographic reconstruction such as computed tomography (CT), positron emission tomography, or magnetic resonance imaging to calculate vascular transit time. For example, stable xenon-enhanced CT scanning measures CBF via conventional scanner interfaced with computer hardware and software and directs the delivery of xenon gas transit throughout brain regions. Serial CT scans are conducted during the inhalation of a gas mixture containing 30% xenon, 30% to 60% oxygen, and room air. The serial images are stored and regional flows are calculated.

CBF is also estimated from measurement of cerebral blood volume. One way to estimate cerebral blood volume is using a gradient echo planar system on MR systems. The dynamic contrast-enhanced susceptibility-weighted perfusion imaging technique involves giving a bolus of paramagnetic contrast material (i.e., gadolinium). The contrast media are traced, and the amount of signal attenuation is proportional to the cerebral blood volume. With a series of multislice measurements, one may generate a time–density curve, and the area under the curve provides an index of relative blood volume (Grandin, 2003). Similar techniques are adapted to CT scanners with the capability for rapid sequential scanning.

The threshold for irreversible brain damage from cerebral ischemia is generally defined as below 20 ml/100 g of tissue/minute (Jones et al., 1981; Yonas, Sekhar, Johnson, & Gur, 1989). CBF below this level alters the functioning of the mitochondria to produce energy. Studies show that the threshold for irreversible brain damage is volume and time dependent. Global brain ischemia that is sustained for longer than 4 to 5 minutes will result in permanent brain damage (Brierley, Meldrum, & Brown, 1973). The majority of studies show that above 23 ml/100 g/minute, little impairment occurs; however, below 20 ml/100 g/minute, symptoms of neurologic impairment develop (Branston, Symon, Crockard, & Pasztor, 1974). Below 18 to 20 ml/100 g/minute, evidence of diminished electrical activity by evoked potentials or electroencephalogram occurs (Sundt, Sharbrough, Anderson, & Michenfelder, 1974). Below 15 ml/100 g/minute is considered to be a threshold for synaptic transmission (Astrup, Siesjo, & Symon, 1981). In addition, factors including temperature, drug administration, and individual variation contribute to the complexity of defining this threshold. Recent work focuses on methods that "noninvasively" detect, track changes in, or treat cerebral ischemia.

The determination and prediction of cerebral ischemia is subject to the strengths and limitations of the technique used to detect low-flow states. As dynamic perfusion CT imaging (Kim et al., 2010) and diffusion-weighted magnetic resonance imaging (Chalela et al., 2007; Totaro et al., 2010) evolve, they improve a clinician's ability to differentiate between cerebral infarct and ischemia (Saver, 2008). To date, there are no serum biomarkers or assays available that can detect the presence of cerebral ischemia; however, advances are being made in the identification of serum biomarkers associated with complications of cerebral ischemia and infarct such as blood–brain barrier disruption (Barr et al., 2010).

Future directions in cerebral ischemia include more specific and sensitive clinical criteria for stages of cerebral ischemia and infarction, noninvasive techniques to measure regional blood flow, and the development of assays of ischemia and/or infarct. As techniques become increasingly more portable and useable, there will be a translation from the radiology department to application by nurses in the community or at the bedside to assess, to predict, to identify, and to monitor patients at risk for cerebral ischemia.

Mary E. Kerr

CHILD DELINQUENTS

Child delinquents, those children who become delinquent at a young age, are two to three times more likely to become serious, violent, and chronic offenders (Loeber, Farrington, & Petechuk, 2003). Because of their early entry into the criminal system, these children have longer offending careers and, as a result, are perceived to constitute a threat to public safety and property (Loeber & Farrington, 2001) as they consume a disproportionately large amount of educational, social, child welfare, mental, and health care resources. Following a report by Snyder (2001) noting a 33% increase in the number of juveniles between the ages of 7 and 12 years handled by U.S. juvenile courts, attention on the problem of child delinquency and chronic criminality dramatically increased. The clinical impact nurses can make in health, social, education, and legal systems can significantly alter the life course trajectory of child delinquents.

Child delinquents are not legally defined in the same way across the United States (Wiig, 2001). Only 14 states have a legally defined minimum age of criminal responsibility, ranging from 6 to 10 years. These states have established a presumption of incapacity for children under the established minimum age, declaring that they are incapable of understanding the wrongfulness of their behaviors. The other states that have not set a minimum age for delinquency rely on the common law definition to establish 7 years of age as the minimum age for delinquency. The root of this common law presumes incapacity to protect children from criminal prosecution. Known as the infancy defense, this presumption can be rebutted by proof that the child understands the act and knows that it was wrong (Kaban & Orlando, 2008).

A Study Group on Very Young Offenders convened by the Office of Juvenile Justice and Delinquency Prevention defined child delinquents as children between 7 and 12 years who had committed a delinquent act (an act that would be a crime if committed by an adult). This was differentiated from disruptive nondelinquent behavior, which was defined by the American Psychiatric Association (2000) as a recurrent pattern of negativistic, defiant, disobedient, and hostile behavior toward others lasting at least 6 months during childhood and adolescence. The study group then classified child delinquents into three categories: serious child delinquents who had committed one or more criminal acts—homicide, aggravated assault, robbery, rape, or serious arson; other child delinquents—all other children excluding the serious delinquent group; and children showing persistent disruptive behavior (including truancy and incorrigibility) who are at risk of offending (Loeber et al., 2003).

It has long been known that aspects of childhood coupled with children's exposure to certain risk and protective factors influence the likelihood of children becoming delinquent at a young age. Most professionals agree that no single risk factor leads a young child to delinquency. There is a developmental aspect to childhood delinquency (Snyder, Espiritu, Huizinga, Loeber, & Petechunk, 2003), and risk factors operate in multiple domains: the individual child, the child's family, the peer group, the school, the neighborhood, and the media. It is generally agreed that early on in a child's life, the most important risks stem from individual factors (e.g., birth complications, temperament) and family factors (e.g., parental antisocial or criminal behavior ,poor child-rearing practices). As the child moves through to adolescence, risk factors related to peer influences, school, and community begin to play a larger role.

Large national specialized studies of child delinquency in the United States are lacking (Snyder et al., 2003). The data that are reported on child delinquents rely on self-report data from three longitudinal studies of the causes and correlates of delinquency: the Denver Youth Survey, the Rochester Youth Development Study, and the Pittsburgh Youth Study (Loeber, Wei, Stouthamer-Loeber, Huizinga, & Thornberry, 1999). The analyses of these data reveal some interesting findings critical to our understanding about these child delinquents. Among both samples, some forms of aggressive behavior (hitting, fighting, and physical attacks) appeared to be normal before the age of 13 years. Initial involvement in serious violence generally did not occur until ages 11 years or later, and prevalence rates declined as the seriousness of the violence increased (Snyder et al., 2003). These children reported substantially less involvement in other types of offenses, particularly for females.

Self-report information from childhood through adolescence indicated that much of the involvement in delinquent behaviors was limited to childhood. For those involved in serious violence, most (40%) were involved for 2 years or less. Only a few (25%) were involved for 5 years or more. Violence and drug use was among the most common offense pattern (Huizinga, Loeber, Thornberry, & Cothern, 2000). Similar findings held for most other offenses, with the exception of status offenses and drug use for 75% or more of juveniles. Interestingly, contact with police increased with age, and boys were more likely than girls to be contacted by the police for delinquency. Children ages 7 to 10 years contacted by police were commonly taken home or to a social services agency. However, more than half of children ages 11 to 12 years contacted by police for delinquency appeared in court, with court dispositions commonly involving fines, community service, restitution, or probation.

An approach to treatment has been to focus on the needs of children with conduct disorder (CD) or CD symptoms (Burns et al., 2003). CD symptoms include aggression toward people and animals, destruction of property, deceitfulness or theft, and serious violations of rules (American Psychiatric Association, 2000, p. 98). The focus has been on children who exhibit CD symptoms because they are prone to other conditions such as attention deficit/hyperactivity disorder, anxiety, depression, and substance abuse (Angold, Costello, & Erkanli, 1999), and the behavior problems associated with CD are often delinquent in nature.

Lipsey and Wilson (1998) reviewed 200 studies published between 1950 and 1995 on the treatment of juvenile offenders and found that the most effective interventions for serious and violent juvenile offenders were interpersonal skills training, individual counseling, and behavioral programs. Brestan and Eyberg (1998) also conducted a review of 82 studies of interventions for children and adolescents with CD and found parent–child treatment programs for pre-school-age youth and programs that focus on the development of problem-solving skills and anger coping among school-age children most effective. Community care, specifically multisystemic system approaches, was at least as effective as inpatient treatment (Burns, Schoenwald, Burchard, Faw, & Santos, 2000). Prevention and early intervention (71%) was endorsed as an effective method to reduce the risk of future offending (Farrington, Loeber, & Kalb, 2001).

Contemporary theoretical contributions recognize the complexities surrounding child delinquency and call upon frameworks in which multiple factors can be accounted for as contributors to outcomes. The world of children and adolescents is complex, and bringing prevention, youth development, treatment, and social rehabilitation models to the interface of the juvenile justice system is challenging. The contributions of the varied models reflect the expertise and perspectives of individuals, but the most significant and difficult to achieve are integration and implementation within the community, which is generally agreed to be the environment where youth and their families achieve best outcomes.

The development and testing of approaches for translating research findings into effective community prevention service systems is important to achieve reductions in the prevalence of youth health and behavior problems (Wandersman, 2003). The Community Youth Development Study (Hawkins et al., 2008) is a large-scale community-randomized trial of 24 communities across seven states nationally. Referred to as Communities That Care (CTC), this coalition-based prevention-operating system uses a public health approach to prevention and is designed to increase communication, collaboration, and ownership among community members and service providers. CTC's principal strategy focuses on strengthening protective factors that can buffer young people from problem behaviors and promote positive youth development (Hawkins & Weiss, 1985). CTC's theory of change hypothesizes that it takes from 2 to 5 years to observe community-level effects on risk factors and 5 or more years to observe effects on adolescent delinquency or substance use. Early findings suggest a slowing of the usual developmental increase in adolescents' risk exposure. Longitudinal study is needed to determine if effects (reduced youth delinquency and substance use) will hold over time. A second study phase is in place currently.

Research has been making incremental steps toward unraveling the complexities resulting in outcomes of youthful offending. Research has clearly demonstrated that youth are developmentally different than adults. Brain imaging research revealed that the brain systems that govern impulse control, planning, and thinking ahead are still developing well beyond age 18 years (MacArthur Foundation, 2008). Behavioral studies confirm that youth are less able to gauge risks and consequences, to control impulses, to handle stress, and to resist peer pressure than adults (Malbin, Boulding, & Brooks, 2010). Research also reveals that most young offenders will cease lawbreaking as part of the normal maturation process (Elliott, 1994), and for the few children with long-term pathways through delinquency, assessment and prevention strategies are even more important. The implications are to implement developmentally appropriate policies and interventions to address our understanding of these research findings.

Research has also shown that a reduction of secure confinement and an increase in reliance on effective community-based services have better outcomes (Holman & Ziedenberg, 2006), but implementation and sustainability of this approach have yet to be achieved (Annie E. Casey Foundation, 2008). As evidenced by the growing focus on implementation science, fidelity strategies, and community-based methodologies, the future lies in science translation. Most aptly stated in a recent report by the Annie E. Casey Foundation (2008), "… juvenile justice has probably suffered the most glaring gaps between best practice and common practice, between what we know and what we most often do" (p. 1).

Deborah Shelton

CHILD–LEAD EXPOSURE EFFECTS

Childhood lead poisoning is recognized as the most important preventable pediatric environmental health problem in the United States, and the adverse health effects of lead exposure in early childhood are well documented. Lead poisoning is defined as exposure to environmental lead that results in whole blood lead concentrations ≥10 μg/dl (Centers for Disease Control [CDC], 1991, 2005). However, there is no safe level of lead exposure because factors such as age during exposure, environmental characteristics of the home, and duration of exposure need to be considered, and adverse neurological effects can occur at blood lead levels (BLLs) well below the 10-μg/dl mark (Bellinger, 2004). Exposure to environmental lead begins in the prenatal period when physiologic stress mobilizes lead from its storage in maternal bone into the blood, where it easily crosses the placenta and is deposited in fetal tissue (Cleveland, Minter, Cobb, Scott, & German, 2008a, 2008b). Depending on the level of lead present in the environment, the exposure can continue as infants and children develop. Absorption of lead is dependent on age and nutritional status; young children and those who have diets high in fats are most susceptible, as are those who are poor and live in deteriorating housing (American Academy of Pediatrics Committee on Environmental Health, 2005). Lead is most commonly ingested through exposure to lead-contaminated paint and the resulting dust, soil, and paint chips. Once ingested, lead is distributed in the blood and eventually is deposited in bone and teeth.

Whole BLLs greater than 10 μg/dl put children at risk for developing a variety of health problems. At high-level exposures (BLL > 20 μg/dl), damage to the nervous, hematopoietic, endocrine, and renal systems can occur. At lower level exposures, these health problems include altered cognitive and neurobehavioral processes including learning disabilities, intellectual impairment, and antisocial behavior. Researchers have demonstrated that some of these effects may be seen in children with BLL as low as 3 μg/dl (Bellinger, 2004; Canfield et al., 2003; Chiodo, Jacobson, & Jacobson, 2004; Lanphear, 2005; Lanphear, Deitrich, Auinger, & Cox, 2000; Needleman & Landrigan, 2004).

Direct results of primary and secondary efforts at prevention of lead toxicity have significantly reduced BLL among young U.S. children within the last 30 years. The major sources of environmental lead exposure have been greatly decreased through the elimination of lead in gasoline, the banning of lead-based paint for residential use, and the elimination of lead solder from food and beverage cans. Despite the success of these efforts, lead poisoning continues to occur in approximately 5% of children 5 years of age and younger, and much higher levels of lead poisoning have consistently been documented among low-income, urban, minority, and immigrant woman and children (Olympio, Goncalves, Gunther, & Bechara, 2009).

Although few nurse researchers have investigated the effects of low-level lead exposure on the neurobehavioral development of children, low-level lead exposure certainly falls within the realm of the phenomena of concern to the discipline. Lead exposure is unquestionably of clinical significance; until all lead is abated from the environment, clinicians will be faced with screening children for lead exposure, preventing exposure through educational efforts, and treating the effects of this preventable public health problem. The deleterious effects of lead exposure have been known for a hundred years; however, progress in prevention has been slow. Some of the reasons for this are related to society's indifference to problems of poor and vulnerable populations and a lack of household educational and environmental interventions that have demonstrated effectiveness at reducing BLLs in children (Yeoh, Woolfenden, Wheeler, Alperstein, & Lanphear, 2009). Until recently, lead exposure was thought to be a problem only for poor inner city minority populations, and parenting practices were thought to contribute to the problem. Also, many considered the elimination of lead in gasoline and paint sufficient to eradicate the problem of lead poisoning. The CDC, in 1991, issued comprehensive guidelines for preventing and treating the problem of childhood lead exposure. These guidelines were issued after the CDC accumulated large amounts of scientific evidence from animal and human studies that supported the hypothesis that the deleterious effects of lead exposure occur at levels previously thought to be harmless. The guidelines were updated in 2005 and emphasize the need for effective strategies to eliminate environmental lead hazards. Despite warnings about the known hazards of lead exposure, no policy for universal screening of BLLs for infants, children, adolescents, and pregnant women has been established.

Childhood lead poisoning was first described in the late 1800s by Gibson, Love, Hardie, Bancroft, and Turner (1892), who encountered a case of peripheral paralysis in a young child and described the similarities of the case to that of chronic lead poisoning in adults. Gibson speculated that the source of the lead poisoning was paint, and he described the long-lasting effects of the exposure. Unfortunately, most of Gibson's observations were ignored, as the prevailing view of the time was that once a child survived lead poisoning, there were no lasting effects. It was not until the early 1970s that cross-sectional and longitudinal studies of low-level lead exposure were conducted.

These early studies of lead exposure involved comparisons of a lead-exposed group and a comparison group on intelligence test measures. As knowledge accumulated and research strategies became more sophisticated, researchers began to assess the influence of covariates, such as parental intelligence, socioeconomic status, and parental education level (Gatsonis & Needleman, 1992). Although conflicting results were common, lead exposure and neurobehavioral deficits remained significantly associated.

The earliest studies of lead poisoning were conducted on children who had BLL ≥ 60 μg/dl and were symptomatic. During the 1970s, researchers focused on asymptomatic children who had BLL in the range of 40 to 50 μg/dl. Conclusions about the effects of lead exposure were difficult to make from these studies because of their methodological shortcomings. In 1979, researchers conducted a major investigation of large cohorts of asymptomatic children and used shed deciduous teeth rather than BLL to measure lead exposure (Needleman et al., 1979). These researchers controlled for major confounding variables and concluded that BLL was associated with lower IQ, decreased attention span, and poor speech and language skills in the children studied. Long-term follow-up of these children lead the researchers to conclude that the effects of low-level lead exposure (equivalent to BLL ≤ 25 μg/dl) persisted throughout young adulthood; failure to complete high school, reading disabilities, and delinquency were behaviors exhibited by children who had elevated BLL at age 7 years (Needleman, Riess, Tobin, Biesecker, & Greenhouse, 1996).

Scientists criticized the work done by Needleman et al. (1979) because the study lacked baseline data about early cognitive abilities of the subjects. For instance, it was proposed that the affected children may have had neurological deficits at birth that would lead them to certain behaviors (increased mouthing) that predisposed them to be lead exposed. To address this issue, subsequent studies were designed to follow large numbers of subjects from birth through early school age, and major outcomes (e.g., IQ level, motor development, cognitive development) were measured whereas large numbers of covariates were controlled. Numerous investigators using comparable designs reported similar findings; thus, a solid consensus among investigators began to emerge that lead was toxic at extremely low concentrations. Research with lead-exposed primates strengthened the consensus, and the toxic level of lead was redefined by the CDC as a BLL ≤ 10 μg/dl.

Recently, nurse researchers have used Dixon's Integrative Environmental Health Model (Dixon & Dixon, 2002) to identify knowledge gaps related to public policy that have prevented the development of effective strategies to create environmental lead-exposure policy change (Perron & O'Grady, 2010).

Researchers continue to study the effects of low-level lead exposure on the development of infants, children, and adolescents. Longitudinal studies involving large and diverse populations that involve standardized measurement and control of known confounders will need to be undertaken. Although these efforts are worthwhile, future efforts also could focus on (1) identifying mediators of lead exposure effects, (2) investigating the effects of strategies to lower BLLs (chelation and environmental lead abatement) on the neurobehavioral outcomes of children, (3) investigating the synergistic effects of other environmental exposures on neurocognitive development, and (4) investigating the effects of educational strategies to inform parents about preventing or reducing environmental lead exposure. Furthermore, investigations of the effectiveness of early intervention strategies for children identified with elevated lead levels need to be conducted. Any efforts that address the primary prevention of the problem would help to protect millions of children against the long-lasting effects of lead exposure.

Heidi V. Krowchuk

CHILDBIRTH EDUCATION

Childbirth education focuses on the learning needs of expectant families and covers a broad range of topics from the physical care needs of expectant women to the psycho-socio-cultural needs of the new family. The goal of childbirth education is to assist families in acquiring the knowledge and skills necessary to achieve a healthy transition through the childbearing process and initial phases of parenthood. Classes range from courses designed for those considering pregnancy through courses dealing with infant care needs and early parenting skills.

Nurses are the professional practitioners who assume the primary responsibility for teaching childbirth education classes within the United States. Nurses are in a unique position to serve as childbirth educators because of their broad knowledge base, including both the biological and the behavioral sciences. In addition, nursing's focus on caring and emphasis on client education enable nurses to guide families toward their childbirth goals with sensitivity using appropriate educational methods. Nurses are the health professionals within the hospital environment who provide the majority of hands-on care and labor support. Thus, nurses are in a strategic position to act as patient advocate and to provide anticipatory guidance regarding birth decisions that are often required within an increasingly complex health care system.

Formal childbirth education in the United States began with classes in hygiene, nutrition, and baby care provided by the American Red Cross. During the early twentieth century, classes on childbirth and family care became increasingly available to American women. As society's view of childbirth shifted from the female-controlled social model to the medical-illness model during the first half of the twentieth century, the focus of classes turned to the management of childbirth pain (Ondeck, 2000).

Contemporary childbirth education dates back to the work of Dick-Read, Lamaze, and Bradley. The notion of pain during labor as secondary to fear and the use of psychological conditioning methods to reduce both the fear and the pain became the basis for "natural childbirth." Although philosophical differences still exist among childbirth education methods, common aspects of all programs include education on (a) the physical process of labor, (b) the physical and psychological conditioning methods, and (c) the supportive assistance during the birthing process.

A number of organizations have affected the progress of childbirth education in the United States. Lamaze International, formerly the American Society of Psychoprophylaxis in Obstetrics, was organized in 1960. The American Society of Psychoprophylaxis in Obstetrics began certifying childbirth educators in 1965 and was one of the first attempts to provide consistency in quality of childbirth education. The International Childbirth Education Association was also founded in 1960 as a consumer group in New York City. It was devoted to a philosophy of consumers working with health professionals for the benefit of the laboring family (Ondeck, 2002). The American Academy of Husband Coached Childbirth was established in 1970 to certify childbirth educators in the Bradley method of childbirth. Bradley method educators are proponents of unmedicated childbirth with significant husband/partner involvement (Monto, 1996).

A number of related keywords were used to search databases for nursing research articles published between 2005 and 2010, including "childbirth education," "prepared childbirth," "childbirth classes," and "childbirth education classes." A total of 186 nursing research articles were identified through CINAHL, PubMed, and PsychINFO. Almost 50 topics were identified; however, little depth was found for the majority of the topics. The range of topics relate to (a) postpartum skills such as parenting and breastfeeding, (b) classes for special populations such as fathers, (c) examination of the benefits of childbirth education for parents, (d) self-care measures during pregnancy and labor, (e) effects of childbirth education on the need for medical interventions such as cesarean deliveries,

(f) caregiver perceptions of childbirth education, (g) teaching strategies, and (h) use of the media (Internet, videos, and TV) for childbirth education.

A mix of both quantitative and qualitative articles was identified. Quasi-experimental and correlational methods predominated in the quantitative studies, and phenomenology was the preferred qualitative research method. In addition, a number of mixed method studies were identified. Very few authors identified a theoretical framework for the study. Several frameworks noted were Roy's adaptation model, Bandura's self-efficacy model, Rosenbaum's learned resourcefulness model, and Donabedian's structure, process, and outcomes framework.

There is a rise in the number of research articles focusing on expectant fathers. Erlandsson and Häggström-Nordin's (2010) phenomenological study found that Swedish fathers attending childbirth education discussions focused on the normalcy of birth, the father's role, infant behaviors, the need for information on complicated births, gender roles, and parenting. The benefits of a male-facilitated, all-male discussion group for expectant fathers in Australia were reported by Friedewald, Fletcher, and Fairbairn (2005). Those fathers discussed topics such as their role as fathers, coping, relationships, and communication.

The use of electronic sources for childbirth education is becoming a focus of research. A research brief reporting on the effects of a popular TV reality show geared to childbirth states the media uses a medical model to depict childbirth, portraying interventions for labor progression and pain as normal, and a lack of information on birth alternatives (VandeVusse & VandeVusse, 2008). Swedish women are reported to use the Internet extensively to seek pregnancy-related information (Larsonn, 2007). These women perceived the information to be reliable, and only about half discussed the information with their health care provider.

The benefits of childbirth education continue to be a focus for nurse researchers. Malata, Hauck, Monterosso, and McCaul's (2007) quasi-experimental study found positive benefits for a childbirth education program designed for the needs of Malawian women. Artieta-Pinedo et al. (2010) reported reduced anxiety among Spanish women who attended childbirth education classes when compared with women not attending the classes. Ngai, Chan, and Ip's (2009) longitudinal study found support for the effectiveness of childbirth psychoeducation for improving learned resourcefulness and decreasing depression outcomes among Chinese women. Childbirth education classes were reported to improve antenatal adaptation for a Turkish population (Serçekus & Mete, 2010).

Familiar topics showing a decline in nursing research studies include childbirth education for teens and the effect of childbirth education on pain control during labor. This raises interesting questions. Has teen pregnancy become so normalized in American culture, as well as worldwide, that there is less emphasis on attending to the developmental needs of teens during pregnancy? Or do researchers believe we know all that is necessary about the care of pregnant teen families? Has the marked acceptance of pharmaceutically managed pain control in labor decreased the interest of both families and nurses in studying alternate options? Or have nurses become discouraged in promoting the concepts of "natural" childbirth?

The increase in the global nature of nursing research on childbirth education is evident. A wide variety of countries on six continents are represented in the nursing literature. Topics show a wide conceptual scope of interest but little depth of study. These studies use a wide variety of methods but have refrained from stating a theoretical perspective for the studies.

Although mother-friendly and baby-friendly initiatives continue to spread through maternity services, a large number of research studies are being generated related to the postpartum hospitalization experience. However, there seems to be a disconnect between studies focusing on the antenatal childbirth education experience and those focusing on the in-patient hospitalization experience. Nursing is in an optimal position to make this logical and vital connection. Also, examination of the impact of childbirth education on vulnerable populations has declined in recent years despite the continued discrepancies noted in pregnancy outcomes for minority groups. If these poor outcomes are to be effectively addressed, the childbirth education needs of vulnerable populations require the continued attention of nurse researchers.

Bobbe Ann Gray

CHRONIC ILLNESS

The practice of nursing has long been identified with the care and comfort of the chronically ill. However, the health care delivery system has not adequately responded to the needs of the increasing numbers of chronically ill adults (Frieden & Henning, 2009; Yach et al., 2010). Until recently, communicable diseases were the leading cause of death worldwide. New medical discoveries and the evolution of public health have improved the ability to survive acute threats, and thus life expectancy has lengthened, changing the course of diseases from acute to chronic (World Health Organization, 2005). Chronic illnesses cause the greatest share of death and disability. Of 58 million deaths worldwide in 2005, 35 million were due to chronic illness, with 80% of those deaths occurring in countries of the global south in equal proportions among men and women (World Health Organization, 2005). In the United States in 2005, an estimated 133 million people, that is, one out of every two adults, are living with at least one chronic illness (Ogden, Carroll, McDowell, & Flegal, 2007).

Chronic illness includes a broad spectrum of diseases that differ significantly from one another in their underlying causes, modes of treatment, symptoms, and effects on a person's life and activity. Chronic illness is usually an unexpected and long-lasting condition of health that often cannot be cured: It affects all, regardless of gender, age, and economic interest. It usually persists for an indefinite period of time, making it impossible to predict its course and outcome. Chronic illness usually requires long-term surveillance and sometimes leaves residual disability (Lubkin & Larsen, 2009). Families are drained physically, emotionally, and financially. There is often upheaval of relations among the patient, family, and other members of society. Overall, chronic illnesses vary greatly in their developmental course. Some conditions improve over time, some stabilize, and others are progressively degenerating and debilitating.

Chronic illness has a huge negative economic impact (Suhrcke, Nugent, Stuckler, & Rocco, 2006). Noncommunicable chronic diseases—including cardiovascular diseases, some cancers, chronic respiratory diseases, and type 2 diabetes—are the major health problems facing the world, and they are a barrier to development and alleviating poverty in countries of the global south (Daar et al., 2007). In a 2007 study, it was estimated that over the next decade, China, India, and the United Kingdom were projected to lose $558 billion, $237 billion, and $33 billion, respectively, in national income as a result of heart disease, stroke, and diabetes, partly as a result of reduced economic productivity (Lopez, Mathers, Ezzati, Jamison, & Murray, 2006). In the United States, expenditures for health care for people with chronic illnesses exceed billions of dollars every year and are associated with 75% of the nation's $2 trillion health care costs each year (Centers for Disease Control and Prevention, 2009). Health care utilization seems to be associated with access and income; in Russia, for example, those with chronic illness with health care insurance and higher average education were associated with higher health care expenditures (Abegunde & Stanciole, 2008).

Beyond its economic impact and strain on health care systems, chronic illness causes psychological strain on individuals and physical and mental health effects on those who care for them, placing burdens on families (Schulz & Sherwood, 2008).

The traditional approach to studying chronic illness has been limited, focusing on the medical model. Research has focused on risk factors, prescriptions, and adherence to treatments (Canadian Nurses Association, 2005). However, a new health paradigm—a care-oriented model of illness—has emerged. The concept of health is more readily measured in terms of maximizing physical, psychological, social, and spiritual well-being. In this paradigm, a holistic health-focused model has become accepted with a resulting change toward care of the whole person as well as the family. In addition, in chronic disease management, all clinical decisions need to be individualized because they usually involve choices between possible outcomes that may be viewed differently by different patients. The self and family management in chronic illness framework was developed to engage individuals and families in the management of their chronic conditions according to their abilities and preferences (Grey, Knafl, & McCorkle, 2006). Building on the self and family management framework, Whittemore and Dixon (2008) have described how adults with chronic illness can, through self-management interventions, integrate their illnesses into their life contexts. De Ridder, Geenen, Kuijer, and van Middendorp (2008) have described how those with chronic conditions who are engaged in self-management strategies have the best chance to adjust to the challenges posed by their chronic illness.

Pollock (1986) provided an initial review of nursing research related to adaptation to chronic illness. More recently, the *Journal of Nursing and Healthcare of Chronic Illness*, published by Wiley-Blackwell and edited by Kralik, is devoted entirely to the nursing care of those with chronic illness. Other important contributions have shown that nursing-led interventions among those with chronic illness improve quality of life and mood (Bakitas et al., 2009). Internationally, nurses can use behavioral and clinical interventions to reduce the risk for many of the problems that lead to chronic illness and death (Besdine & Welte, 2010).

The landscape of chronic illness is diverse and complex, presenting a vast range of symptoms and trajectories, accomplished by a variety of demands over the natural history of the diseases. The impact of chronic illness on the patient, well family members, and key caregivers differs and depends on when an illness strikes in the family and on each member's individual development. As chronic illness continues to advance throughout the world, it pushes individuals, families, and countries into poverty. Nurses can be the bridge between those affected by chronic illness and health care services by promoting health, by preventing disease, and by caring for people (del Pilar Camargo Plazas, 2009).

Ruth McCorkle
Mark Lazenby

CINAHL® DATABASE

In the late 1940s, while *Index Medicus* existed for the biomedical literature, there was no index to the few nursing journals published at the time. Individual librarians took it upon themselves at their particular hospital or school of nursing to index the journals they received for their own population, a tremendous "duplication of effort and expenditure" as well as "waste on a national scale" (Grandbois, 1964, p. 676). One such librarian in Los Angeles, Ella Crandall, used 3 × 5 index cards to meet the needs of the nurses on the staff of White Memorial Hospital and, later, Los Angeles County Hospital. This index which began as an internal project was published as *The Cumulative Index to Nursing Literature* in 1961, a cumulation of indexing covering the period 1956 to 1960. Seventeen journals were included in this publication—from the *American Journal of Nursing* and *Nursing Research* to the *American Association of Industrial Nurses Journal*. The "red books" as this publication became known were well received in the nursing community (Raisig, 1964) and became a familiar part of nursing education throughout the United States.

Over the next four decades and more, the index grew and changed, reflecting the changes taking place in the profession itself. Although, as would be expected, many indexing terms are similar or identical to those used in the indexing of biomedical journals, there are some important differences, and the many terms added to the thesaurus demonstrate the development and growth of the nursing profession, both as a practice and as a science. The thesaurus is composed of a hierarchical tree structure that is used to index to the most specific focus of the material. Broad categories include anatomy, diseases, and health care, among others. An example of this hierarchy would be as follows:

Social control
Human rights
Patient rights
Treatment refusal

An article specifically concerning a patient who was unwilling to accept care would be indexed with the most specific term: "treatment refusal." A more general article might be indexed using the "patient rights" term. Increased emphasis on nursing research, specialty and advanced practice, or managed care has resulted in indexing terms such as phenomenology, survival analysis, family nurse practitioners, case management, and nursing intensity. Research terms describing design, methodology, analysis, and data collection have been added, as have the names of nursing specialties, organizations, and classification systems.

Aside from the terms used, the materials indexed are different from those in indexes of the biomedical and other literature. Books and book chapters, pamphlets, pamphlet chapters, dissertations, audiovisuals, consumer health, and patient education materials are just a few of the other types of materials indexed. Because of the difficulty in obtaining these materials, they are often defined as elusive or fugitive literature.

Other changes have also taken place over these years. Recognizing that the boundaries of nursing intersect with many other health care disciplines, allied health was added to the index title in 1977, resulting in the *Cumulative Index to Nursing and Allied Health Literature* (CINAHL®). There are 17 such disciplines covered, including physical therapy, occupational therapy, and communicative disorders. In 1983, the CINAHL electronic database became part of several online services and was released as a CD-ROM in 1989.

Recent years have seen the development of CINAHL-created documents as part of the database. These include research instrument descriptions, clinical innovations, accreditation materials, and legal case descriptions. The database can no longer be viewed as only a bibliographic database although that continues to be its primary function. Like *Index Medicus*, the print index is no longer published in printed form; the database is now available only electronically.

Throughout the nearly 50 years of its existence, the primary goal of CINAHL Information Systems, as publisher of the index and now the database, has been to connect nursing and later allied health professionals with materials written about and for them. The basic premise underlying the existence of this tool is that effective and knowledgeable practice depends on access to materials describing or studying that practice. These materials may be present in a variety of formats and from a variety of sources. Whereas indexing began with fewer than 10 journals, the current journal list includes more than 3,000 titles. Content other than that listed above includes practice guidelines, practice acts, standards of practice, critical pathways, and even full text of some journal articles. This is far too much material for any individual to subscribe to or otherwise acquire randomly, making an index to the material essential. "Increased emphasis on professionalization of nursing and clinical competence" (Pravikoff, 1993, p. 33), changes in health care delivery, and ever-increasing time pressures make any tool that assists in gathering information critical to practice. Searching this material on a regular basis should be a professional obligation of members of all health care disciplines for the duration of their careers. Evidence-based nursing practice requires access to the best available information to "provide the most consistent and best possible care to patients" (Pravikoff, Tanner, & Pierce, 1994, p. 40).

Diane Shea Pravikoff

CLINICAL CARE CLASSIFICATION SYSTEM

The Clinical Care Classification (CCC) System, previously known as the Home Health Care Classification System (Version 1.0), is a standardized, coded nursing terminology system that identifies discrete atomic-level concepts and data elements of nursing practice. The CCC System provides a unified framework and coding structure for nurses and allied health professionals to electronically capture and document the "essence of care" in all health care settings. The CCC System is a clinical decision-support terminology developed empirically from research of live patient care data records and designed for measuring outcomes and determining care costs, workload, and resources in any health care information technology (HIT) system. The CCC System Version 2.1 is based on a coded, standardized, and unified framework for electronic documentation, processing, retrieval, and analysis following the conceptual framework of the American Nurses Association (ANA) six nursing process standards (2003) (assessment, diagnosis, outcome identification, planning, implementation, and evaluation) to assess, to document, and to evaluate a patient holistically.

The CCC System is the first National Nursing Standard accepted by the Department of Health and Human Services as a coded interoperable terminology for the information exchange of health data in the electronic health record through the Office of the National Coordinator for Health Information Technology and the Office of the National Coordinator Healthcare Information Technology Standards Panel Biosurveillance Technical Committee in the first set of approximately 55 standards adopted by the Department of Health and Human Services Secretary in 2007 and 2008. The CCC System is free with permission, consists of atomic-level concepts and open source/open architecture for documentation of patient care in the electronic health record systems. The CCC is interoperable with the American National Standards Institute, Health Level Seven, integrated in Logical Observations Identifiers Names and Codes, meets the Cimino criteria for a standardized terminology, is an ANA recognized terminology, and conforms to ISO Reference Terminology Model for Nursing (ISO-18104). The CCC System is also indexed in the Metathesaurus of the Unified Medical Language System and Cumulative Index of Nursing and Allied Health Literature.

The CCC System was developed as part of a federally funded research study by the Health Care Financing Administration

(1988–1991) to develop a methodology for electronically assessing and classifying Medicare patients to predict nursing resources and evaluate outcomes. The research study was conducted by Dr. Virginia K. Saba, RN, EdD, FAAN, FAMCI, LL, and her colleagues at the School of Nursing, Georgetown University, Washington, DC. The research study consisted of a national sample of almost 650 health care facilities, which collected data on approximately 9,000 newly discharged Medicare cases representing each patient's entire episode of care from admission to discharge. The CCC System (Version 2.1) provides the documentation of nursing care by linking nursing diagnoses, interventions, and outcomes using the six standards of the nursing process recommended by the ANA (2003).

The CCC System was empirically developed from the computer processing of approximately 40,000 textual phrases representing nursing diagnoses and/or patient problems and 72,000 phrases depicting patient care services and/or actions collected on the research study cases from live patient records. The textual phrases were processed by computer using keyword sorts, statistical analyses, and other computerized techniques, which provided the framework for classifying, coding, and indexing the textual phrases to create the one system known as the Home Health Care Classification Version 1.0. It was revised in 2003–2004 from research study and feedback from "live" HIT systems to form Version 2.0 and the current CCC System Version 2.1.

The CCC System, Version 2.1, consists of two terminologies: the CCC Nursing Diagnoses and Outcomes and the CCC Nursing Interventions/Actions. Together, the two interrelated terminologies form one single system classified by 21 care components and organized by 4 health care patterns. CCC of Nursing Diagnoses consists of 182 code concepts (59 major and 123 subcategories). CCC of Nursing Interventions consists of 792 nursing interventions (198 interventions [72 major and 126 subcategories] and 4 action qualifiers: assess/monitor, perform/care, teach/instruct, and manage/refer). CCC of Nursing Outcomes consists of 546 nursing diagnosis outcomes (182 diagnoses and 3 outcome qualifiers: improve, stabilize, and deteriorate) to code expected and actual outcomes.

The CCC System consists of a four-level framework that allows data to be coded at multiple levels of abstraction and analyzed at multiple levels of granularity. The highest level is four health care patterns: health behavioral, functional, physiological, and psychological, each of which represents a different number of care components. The health care patterns provide the framework for the third level of the 21 care components—a cluster of elements that depicts a holistic approach to patient care. The care components are as follows: activity, bowel/gastric elimination, cardiac, cognitive, coping, fluid volume, health behavior, medication, metabolic, nutritional, physical regulation, respiratory, role relationship, safety, self-care, self-concept, sensory, skin integrity, tissue perfusion, urinary elimination, and life cycle. The 21 care component nursing classes were found to be clinically relevant and the best predictors of health care resources (Holzemer et al., 1997).

The next level consists of two interrelated terminologies: (1) the CCC of Nursing Diagnoses and Outcomes and (2) the CCC of Nursing Interventions and Actions. The CCC of Nursing Diagnoses and Outcomes depicts patient conditions and/or problems requiring clinical care by nurses and allied health professionals. The definition of a nursing diagnosis is based on the definition used by the North American Nursing Diagnosis Association (1992). An example of CCC Nursing Diagnosis is Activity Alteration (A01). Each nursing diagnosis is also paired with three outcome qualifiers (improve, stabilize, and deteriorate) to depict an expected and an actual outcome representing the 546 CCC Outcomes. The qualifier digit represents the lowest level of the framework and provides the codes for expected outcomes (goal of care) and actual outcomes (goal resolution); for example, Expected Outcome (Goal) to Improve Activity Alteration (A01.0.1), whereas Actual Outcome Activity Alteration Stabilized (A01.0.2).

The CCC of Nursing Interventions and Actions is the terminology used to document the "essence of nursing care" determined to treat the diagnosis, problem, or condition. The definition of a nursing intervention is "A single nursing action designed to achieve an outcome for a nursing or medical diagnosis for which the nurse is accountable" (Saba, 2007, p. 328). An example of CCC Nursing Intervention is Cast Care (A02.1). Each nursing interventions is always modified by one of four Action qualifiers: (1) assess/monitor, (2) perform/care, (3) teach/instruct, or (4) manager/refer. The qualifier digit also represents the lowest level of the framework, which expands the nursing intervention, service, activity, and so forth, and provides the codes for the four action types. Examples of intervention actions are as follows: assess cast care (A02.1.1), perform cast care (A02.1.2), teach cast care (A02.1.3), and manage cast care (A02.1.4). The four codes make the intervention action data easier to process, retrieve, and analyze; that is, the four intervention actions require different services, skills, and time, making it possible to measure outcomes, determine cost, workload, and resources.

The CCC System coding structure is based on the structure of the *International Classification of Diseases and Health Related Problems, Tenth Revision* (Who, 1992). Each diagnostic and intervention concept is assigned a unique five alphanumeric character code: first position, an alphabetic character for the care component; second and third positions, a two-digit code for a core data element (major category) followed by a decimal point; fourth position, a one-digit code for a subcategory (if needed); and fifth position, a one-digit code for a qualifier outcome or action. This coding structure facilitates the design of clinical care pathways as well as other plans of care applications.

The CCC System has been implemented by numerous HIT vendor systems: Siemens Medical Solutions integrated the CCC into Sorian©, which is distributed around the world. It has also been implemented in hospitals, for example, Rush Presbyterian Hospital (Chicago, IL), Southeast Hospitals Group (Fall River, MA), Orton Hospital (Helsinki, Finland), Kupio Hospital (Kupoi, Finland), Hospital Corporation of America (HCA), and numerous others. Further, it is translated into Dutch, Portuguese, Spanish, Finnish, Korean, Turkish, and so forth.

In summary, the CCC System Version 2.1 documents nursing practice following the nursing process. It is being used in nursing research for the design of decision support systems, in nursing education by incorporating it in PDAs for electronic documentation, and as a simulated system using a PC to enhance the learning of the nursing process. The CCC System validates the documentation of nursing practice makes nursing visible, provides the data for the "essence of nursing" care, and contributes to patient care while advancing nursing science.

Virginia K. Saba

Clinical Decision Making

Clinical decision making is a process that involves the interaction among the knowledge of preexisting pathological conditions, patient data, clinical experience, and judgment (Banning, 2008). Clinical decision-making ability is defined as the ability by which a clinician identifies, prioritizes, establishes plans, and evaluates data. Decision making is central to professional nursing and has vital links to patient care outcomes

(Catolico, Navas, Sommer, & Collins, 1996). Researchers have investigated the process, types, and quality of clinical decision making. Catolico et al. (1996) studied decision making of practicing staff nurses. It was demonstrated that nurses with better communication skills had a greater frequency of actual decision-making practices. Intuition was a critical component of clinical decision making in a qualitative study of novice nurse practitioners (Kosowski & Roberts, 2003). Some researchers have looked at approaches such as informatics or algorithms to aid decision making. Gillespie and Peterson (2009) showed that that the use of a decision-making framework to guide clinical decision making by novice nurses fostered the development of their knowledge, skill, and confidence.

A critical issue in clinical decision making is the educational level, preparation, and experience of the nurses who are formulating decisions. Studies have explored the decision-making process of student nurses, staff nurses, and nurse practitioners. A group of nursing students were given didactic and interactive teaching sessions on clinical decision making. Students' decision making was in accordance with the decision making of experts significantly more often than that of the student nurses who did not receive the decision-making content (Shamian, 1991). A study in the United Kingdom demonstrated that nurses having a college education were significantly better at decision making than their colleagues educated in diploma programs (Girot, 2000). Advanced practice nurses in specialty practices tend to generate fewer hypotheses in their clinical decision making. Those nurses must be aware that formulating a diagnosis too early in the data-gathering phase precludes the possibility of considering all options (Lipman & Deatrick, 1997). Nurses with case-related experiences are more likely to choose appropriate interventions. A study of nurse practitioners by White, Nativio, Kobert, and Engberg (1992) concluded that case content expertise is crucial for clinical decision making from the aspect of understanding the significance of the data acquired and in making the correct decision. Nurses gain a sense of saliency in clinical decision making with increased experience (Banning, 2008). In a study of novice and expert nurses in an intensive care unit, it was demonstrated that expert nurses used a wider range of cues, and more cues that identified impending problems, in their clinical decision making (Hopkins, Aitken, & Duffield, 2009).

When investigating the decision-making process, researchers have used simulations, together with interviews regarding the thought processes individuals use to reach decisions. The quality of decision making is defined as having the ability to make frequently required decisions (Catolico et al., 1996). That aspect of decision making has been studied by using computer-assisted simulations requiring nurses to make decisions in controlled clinical situations. To investigate clinical decision making by nurse practitioners, the nurses care for patients via computer and interactive videos. Decision support technology serves as an adjunct to, not as a replacement for, actual clinical decision making. Advanced practice nurses integrate clinical decision systems into their practices is to provide more objective, scientifically derived, technology-based data for their patient care decisions (Traynor, Boland, & Buus, 2010). There are some inherent difficulties with technology-based decision support systems. Nurses who are unfamiliar or uncomfortable with the technology are less likely to value the utilization of the systems (Weber, Crago, Sherwood, & Smith, 2009).

Nurses have a professional responsibility to provide patients with opportunities to participate in clinical decision making. However, patients' preferences to participate vary greatly. Patient participation in clinical decision making has been studied from a variety of perspectives. In a study of more than 400 patients, it was shown that females, those with a high school or college education, and those with previous hospital experience are significantly more likely to prefer an active role in clinical decision making (Florin, Ehrenberg, & Ehnfors, 2008). It is also crucial for nurses to have knowledge of ethical issues related to clinical decision making. This is particularly important when the decision process is regarding end-of-life care (Mahon, 2010).

Nurses' decision making has been shown to be affected by the sociodemographics of the patient. Age, sex, race, religion, and socioeconomic status can impact on decision making. Racial disparities in health care may be due to racial biases when formulating clinical decisions. Interviews with African American patients with diabetes revealed that they believed that shared decision making was offered more often to White patients (Peek et al., 2010). Non-White patients presenting to the emergency department with chest pain are hospitalized less frequently than White patients (Pope et al., 2000). There was a significant difference in reports of suspected abuse after the evaluation of fractures between minority and nonminority children (Lane, Rubin, Monteith, & Christian, 2002). Competent clinical decision making by nurses requires being cognizant of potential biases. Decision making is critical to nursing practice. Gathering, organizing, and prioritizing data are major components of the process. Continued research in this area can foster the development of decision-making skills in novice nurses and cultivate high clinical decision-making ability in expert nurses.

Terri H. Lipman

CLINICAL JUDGMENT

Clinical judgment has been defined as the process by which nurses come to understand problems, issues, or concerns of patients, attend to salient information, and respond in concerned and involved ways. Clinical judgment occurs within a framework of clinical, legal, ethical, and regulatory standards and is closely aligned with phenomena such as critical thinking, decision making, problem solving, and the nursing process (Benner, Tanner, & Chesla, 1996).

Expert clinical judgment is held in high regard by nurses as it is generally viewed as essential for provision of safe, effective nursing care and the promotion of desired outcomes. Nursing research has been conducted on the processes of clinical judgment with the intent to better understand how nurses identify relevant information from the vast amounts of information available and then use that information to make inferences about patient status and appropriate interventions. The complexity of the clinical judgment process has brought about collaboration of nurse researchers with multidisciplinary experts from a broad array of scientific backgrounds including cognitive psychology, informatics, phenomenology, and statistics.

The body of research on clinical judgment generated by interdisciplinary collaboration has been categorized into two distinct theoretical classifications: the "rationalistic" and the "phenomenological" perspectives. In this context, the term "rationalistic" describes scientific inquiry into the deliberate, conscious, and analytic aspects of clinical judgment (Benner et al., 1996). Examples include research on the role of information processing, diagnostic reasoning (Tanner, Padrick, Westfall, & Putzier, 1987), and decision analysis (Schwartz, Gorry, Kassirer, & Essig, 1973) in the clinical judgment process. The term "phenomenological" refers to research on the skill-acquisition component of clinical judgment as advanced by Benner and Tanner (1987) and Benner et al. (1996) in the Novice to Expert Model.

Information processing theory and diagnostic reasoning are based on the work of Elstein, Shulman, and Sprafka (1978) and Newell and Simon (1972) and collectively describe problem-solving behavior and the effect of memory and the environment on problem solving. These theories hold that human information processing capacity is restricted by short-term memory, and effective problem-solving ability is dependent on adoption of strategies to overcome human limitations. Information processing theory and diagnostic reasoning have been applied widely to the study of clinical judgment and the use of information in the clinical judgment process. The literature suggests that nurses and physicians use a similar process for clinical judgment, which involves information gathering, early hypothesis generation, and then additional information gathering to confirm or rule out a suspected diagnosis or clinical problem. According to the "rationalistic theories," early hypothesis generation "chunks" data and is an effective strategy for conserving short-term memory (Corcoran, 1986; Elstein et al., 1978; Tanner et al., 1987). Although knowledge generated from work completed in the fields of information processing and diagnostic reasoning has been descriptive in nature, decision analysis is a prescriptive approach to decision making and involves the process of weighing cues and using mathematical models (generally made possible through expert systems) to determine the course of action most likely to produce desired outcomes.

Corcoran (1986) used an information processing approach and verbal protocol technique to compare care-planning strategies used by hospice nurses. She found that unlike novice nurses, the overall approach of expert nurses differed by case complexity with a systematic method used for less complex cases and an exploratory approach for cases of greater complexity. In addition, expert nurses generated more alternative actions during the treatment planning process, were better able to evaluate alternative actions, and developed better care plans than did novices.

Tanner et al. (1987) used verbal responses to videotape vignettes to describe and compare the cognitive strategies of diagnostic reasoning used by nursing students and practicing nurses. They found that practicing nurses were more likely to use a systematic approach and to be more accurate in diagnosis than the students. Henry (1991) examined the effect of patient acuity on clinical decision making of experienced and inexperienced critical care nurses using computerized simulations. Findings suggest that inexperienced nurses collected more data and had poorer patient outcomes than experienced nurses.

Salantera, Eriksson, Junnola, Salminen, and Lauri (2003) used simulated case descriptions and the think-aloud method to compare and describe the process of information gathering and clinical judgment by nurses and physicians working with cancer patients. The authors found that while nurses and physicians identify similar problems, they use divergent approaches to information gathering and knowledge base application for the purposes of clinical judgment. They found that nurses rely more on personal knowledge, whereas physicians rely more heavily on theory.

Unlike the objective, detached approach to the study of clinical judgment characteristic of the rationalistic perspective, the phenomenological perspective holds that intuition is a legitimate and essential aspect of clinical judgment and is the feature that distinguishes expert human judgment from that of expert systems (Benner & Tanner, 1987). Benner's work is based on the skill-acquisition model advanced by Dreyfus and Dreyfus (1980). According to this model, there are six key aspects of intuitive judgment: pattern recognition, similarity recognition, commonsense understanding, skilled know-how, sense of salience, and deliberative rationality (Benner & Tanner, 1987). Much of the research related to Benner's work and the Novice to Expert Model relates to the relationships that exist between nursing knowledge, clinical expertise, and intuition.

The Novice to Expert Model was developed using a phenomenological approach to interview and observe nurses with varying degrees of clinical expertise. In the interview process, nurses were asked to describe outstanding clinical situations from their practice. Benner found that a holistic grasp of clinical situations is a necessary precursor to expert clinical judgment (Benner, 1984). Subsequent research supports these findings and discriminates between differences in clinical judgment among clinicians with varying levels of experience (Corcoran, 1986). In a 6-year interpretive study of nursing practice, Benner et al. (1996) identified five interrelated aspects of clinical judgment: (1) disposition toward what is good and right, (2) extensive practical knowledge, (3) emotional responses to the context of a clinical situation, (4) intuition, and (5) role of narrative in understanding a patient's story, meanings, intents and concerns. The authors suggested that these aspects play a significant role in clinical judgment and deserve equal consideration along with the aspects arising from the "rationalistic" perspective of clinical judgment.

On the basis of a critical review of literature published through 2004, Tanner (2006) proposed an alternative model of clinical judgment. The Tanner Clinical Judgment Model (CJM) represents the complexity of the construct including its interrelation with the nurses' background, the situational context, and the degree to which knowing the patient influences interpretation of findings, response, and reflection on that response (Tanner, 2006). The CJM proposes a nonlinear process that characterizes the clinical judgment skills used by expert nurses. However, the model supports the diagnosis of breakdown in clinical judgment with novice nurses by faculty members and preceptors. The CJM also supports self-diagnosis of lapses in clinical judgment by more experienced nurses through self-reflection on practice. The CJM includes four distinct yet iterative phases: (1) noticing, (2) interpreting, (3) responding, and (4) reflecting. A description of each phase is included in Table 1.

Table 1
FOUR PHASES OF THE TANNER CJM

CJM Aspect	*Description*
Noticing	Perceiving the situation based on clinical knowledge, clinical experience, and knowing the patient
Interpreting	Developing a deep understanding of the situation
Responding	Intervening based on clinical reasoning
Reflecting	Reading the patient response to interventions and making adjustments to care based on that response; ongoing deliberation of practice to secure lessons learned

From Tanner, 2006.

Using the CJM as a conceptual framework, Lasater (2007) developed the Clinical Judgment Rubric to provide a means to describe and quantify levels of performance in clinical judgment. Neilson further developed this work though development of the CJM study guide that uses the phases of Tanner's model to assist students in application of the model to assigned patients in clinical practice (Nielsen, Stragnell, & Jester, 2007). Together, the Clinical Judgment Rubric and the study guide provide an evaluation framework to assist faculty and preceptors in recognizing and evaluating clinical judgment skills in more novice nurses. In addition, these tools provide guiding principles and a standardized language for offering feedback to students as they work to develop clinical judgment skills.

Although early research on clinical judgment identified two divergent but legitimate perspectives of rationalistic and phenomenological approaches, the more recent work (Lasater, 2007; Neilson 2007; Tanner, 2006) indicates signs of convergence. The challenge for future research is continued integration of these perspectives to apply what is known and to study the impact of integrated models on clinical reasoning and patient outcomes. Tanner's CJM provides a framework that holds promise not only for supporting the skill-acquisition component of clinical judgment but also for guiding research on clinical reasoning patterns, associated actions, and practice outcomes.

Patricia C. Dykes
Moreen Donahue

CLINICAL NURSING RESEARCH

Clinical nursing research is both broadly and narrowly defined. Broadly, it denotes any research of relevance to nursing practice that is focused on care recipients, their problems and needs. This broad definition stems from the 1960s, when a major change occurred in nursing science. Before the 1960s, the research of nurses had focused on nurses and the profession of nursing including major questions of interest related to nursing education and the way in which nurses practiced within care delivery structures (i.e., hospitals). The reasons for these foci are many, but for the most part they stem from the dearth of nurses with advanced degrees at that time and the fact that nurses with advanced degrees were educated in other disciplines (e.g., education).

In the late 1950s and 1960s, a major shift occurred, driven by three factors. First, leaders in nursing successfully lobbied for the institution of the nurse scientist program through the federal government, which provided financial support for nurses to be educated in the sciences (e.g., physiology, biology, anthropology, psychology). Second, nurse theorists such as Faye Abdellah, Virginia Henderson, Imogene King, Ida Orlando, Hildegard Peplau, and Martha Rogers began to formulate conceptual models to direct nursing practice, and attention was focused on designing research that more or less was guided by those models (or at least the substantive areas circumscribed by the models). Third, as more nurses attained advanced degrees, doctoral education with a major in nursing finally became a reality, and the focus of nursing research shifted more firmly away from nurses and nursing education to the practice of clinical nursing. The broad definition of clinical nursing research, then, was originally formulated to differentiate between the research conducted by nurses before the 1960s, which focused on nurses, and the major shift in focus on practice.

Strongly influenced by the establishment of the Center for Nursing Research (at present the National Institute of Nursing Research) in the National Institutes of Health, clinical nursing research has recently taken on a narrower definition, modeled after the definition of clinical trials (large-scale experiments designed to test the efficacy of treatment on human subjects) used at National Institutes of Health. This narrow definition limits clinical nursing research to only those studies that focus on testing the effects of nursing interventions on clinical or "nurse sensitive" outcomes.

In addition to an evolution in definition, clinical nursing research also has changed in form and complexity over time. Early clinical nursing research was characterized by a focus on circumscribed areas of inquiry using experimental and quasi-experimental methodologies. Investigators were few and tended to work in isolation. Often an investigator conducted single studies on different problems rather than series of studies focused on different aspects of the same problem. As a result, study results tended to be context bound and limited in generalizability to other settings, samples, or problems. The relationship between theory development and research was discussed abstractly but not explicitly operationalized, and a philosophy of knowledge building rather than problem solving had not yet developed.

The next stage in the evolution occurred with the realization that little was known about many of the phenomena of concern to nurses. This heralded a period during which emphasis shifted away from experimental methods to exploratory/descriptive methods, such as grounded theory. Guided by the meta-paradigm of nursing (person, nursing, health, and environment), nurse scientists began focusing on discovering and naming the concepts of relevance for study in nursing, delineating the structure of these concepts, and hypothesizing about the relationships of these concepts in theoretical systems.

More recently, clinical nursing research has become clearly defined as a cumulative, evolutionary process. Investigators are still advised to derive questions from clinical problems, but the focus is on knowledge generation, specifically the generation and testing of middle-range theory (a theory that explains a class of human responses), for example, self-help responses, symptom experience and management, and family responses to caregiving. Because knowledge is viewed as cumulative, investigators usually study various aspects of one particular concept or response; studies build on one another, and each study adds a new dimension of understanding about the concept of interest. This approach to clinical nursing research requires investigators to use multiple methodologies in their programs of research, including (a) inductive techniques to discover knowledge from data, (b) deductive techniques to test hypotheses that are either induced or deduced, and (c) instrumentation to increase the sensitivity, reliability, and validity of the measurement system designed for the concept.

The methodologies being used include qualitative methods such as ethnomethodology, grounded theory, and phenomenology and quantitative methods, ranging from traditional experimental methods and designs to less traditional methods, such as path analysis and latent variable modeling. Because human responses change over time on the basis of contextual factors or treatments (independent variables) applied by the nurse investigator and because understanding the nature of change often is at the crux of the theory building, skills in measuring change also may be required. This has resulted in the need for many investigators to incorporate techniques such as time series analysis and individual regression into their research.

Understanding the human responses of concern to nurses can also require an understanding of cellular mechanisms that are best studied in animal models and a coupling of biological techniques such as radioimmunoassay and electron microscopy, with psychosocial techniques such as neurocognitive assessment or self-report of psychological states. In addition, measurement of different units of analysis (e.g., individual, family, organization) may be required, along with strategies for understanding the effect of care contexts (e.g., social, physical, organizational environments) on the human response of concern. Needless to say, single investigators rarely have all the skills needed to advance the understanding of a particular concept. As a consequence, single investigators are becoming more and more a thing of the past as teams of scientists, including nurses and individuals from other disciplines, collaborate in the knowledge-building endeavor.

Nursing is concerned with human responses and is based on the assumption that humans are holistic and embedded in history and various environments. Clinical nursing research is about generating a body of knowledge on which nurses can base practice. It is about assuring the efficacy and safety of nursing actions, substantiating the effect of nursing actions on patient outcomes, and conserving resources (costs, time, and effort) while effecting the best possible results. It is about identifying strategies for improving the health of the population and promoting humanization within a health care environment that has a natural tendency to be mechanistic, compartmentalized, and focused on short-term rather than long-term gain. It is about client advocacy, client protection, and client empowerment. The challenge of clinical nursing research is to develop an understanding of human response through theory generation and testing while developing measurement systems and using research methods that capture the holism of the client and the holistic nature of the health care experience.

Linda R. Phillips

Clinical Preventive Services

Clinical preventive services are screenings, vaccinations, counseling, or other preventive services delivered to one patient at a time by a health care practitioner in an office, clinic, or health care system (Centers for Disease Control and Prevention, 2010). Timely receipt of clinical preventive services (Nelson et al., 2002; Taylor-Seehafer, Tyler, Murphy-Smith, Hitt, & Meier, 2004; United States Preventive Services Task Force [USPSTF], 1996) can reduce premature mortality and morbidity. Evidence suggests that screening for colorectal and breast cancer can reduce morbidity and mortality for many older patients (Holmboe et al., 2000; Pignone, Rich, Teutsch, Berg, & Lohr, 2002; Smith et al., 2001). There is strong consensus that screening for colorectal, breast, and cervical cancer, screening for high blood cholesterol levels, and timely receipt of adult immunizations can reduce the risk of premature death (Apantaku, 2000; Lawvere et al., 2004; Nelson et al., 2002) and that tobacco use, excessive alcohol use, physical inactivity, obesity, and failure to use safety belts increase mortality risk (Kerlikowski et al.; Nelson et al., 2002; Shapiro, Seeff, & Nadel, 2001).

Although scientific evidence exists for emphasizing prevention within clinicians' practices, studies have shown that clinicians often fail to provide recommended clinical preventive services (Ayres & Griffith, 2007a, 2007b, 2008; Finney Rutten, Nelson, & Meissner, 2004; Lopez-de-Munain, Torcal, Lopez, & Garay, 2001; Ma, Urizar, Alehegn, & Stafford, 2004; Natarajan & Nietert, 2003; Nelson et al., 2002; Solberg, Kottke, & Brekke, 2001; Stange, Flocke, Goodwin, Kelly, & Zyzanski, 2000; USPSTF, 2000). A number of variables influence the delivery of clinical preventive services primary care providers. Research has shown that lack of the provision of preventive services included clinicians' report lack of time (Ayres & Griffith, 2007a, 2007b, 2008; Frame, 1992; Jackson, 2002), lack of commitment to prioritize preventive services, inadequate reimbursement for clinical preventive services, lack of adequate clinician training, and the lack of a system to integrate clinical preventive services into regular patient care (Ayres & Griffith, 2006, 2007a, 2007b, 2008; Cornuz, 2000).

Attributes of primary care such as patient preference for their regular physician, interpersonal communication, and coordination of care influence the delivery of clinical preventive services. In addition, personal factors have also been found to influence the delivery of clinical preventive services. Clinician failure to use recommendations in the form of clinical guidelines has been explained by a perceived lack of effectiveness, lack of familiarity with the content of published recommendations, the belief that some forms of recommended care do not apply in ones' own practice, the reduced confidence that screening will lead to expected outcomes, and the uncertainty about which preventive services to provide to their patients (Ayres & Griffith, 2006, 2007a, 2007b; Lawvere et al., 2004; Litaker, Flocke, Frolkis, & Stange, 2005; Tudiver et al., 2001; USPSTF, 2000; Zitzelsberger, Grunfeld, & Graham, 2004; Zoorob, Anderson, Cefalu, & Sidani, 2001).

Primary care practices are strategic avenues for initiating clinical preventive services. Yet, although visits to the doctor's office are appropriate times to advise patients on health behaviors, these opportunities are often missed (Woolf & Atkins, 2001). Studies have reported that nurse practitioners (NPs) provide more preventive care than do physicians (Hooker & McCaig, 2001); however, no studies to date have solely investigated the factors that may influence the delivery rates of clinical preventive services provided by NPs based on the theoretical literature. Studies that examined the delivery of clinical preventive services have been conducted exclusively with physicians or have included NPs under an umbrella term of "clinicians" dominated by physicians and examined under a medical practice model.

There is a growing body of evidence that NPs and physicians differ in the preventive and treatment strategies they use during patient encounters and in the populations served (Aparasu & Hegge, 2001; Hopkins, Lenz, Pontes, Lin, & Mundinger, 2005; Lenz, Mundinger, Hopkins, Lin, & Smolowitz, 2002; Lin, Hooker, Lenz, & Hopkins, 2002; Moody, Smith, & Glenn, 1999; Pieper & Dinardo, 2001). For example, the process of NP and MD patient encounters and the populations these providers tend to serve have been examined in several studies using data from the National Ambulatory Medical Care Survey (NAMCS). One study found that NPs directly supervised by MDs saw younger patients than MDs and provided counseling and education during a higher proportion of visits (Crabtree et al., 2006; Hooker & McCaig, 2001; Hung et al., 2006). Another study examined patient encounters of NPs combined with physicians' assistants (PAs) and found that NP/PA patients were more likely to be 65 years or older, female, Black, and from the Northeastern United States when compared with MD patients (Aparasu & Hegge, 2001). Another study that used NAMCS data found NPs to have younger clients who were more often female. NPs also tended to provide more health counseling interventions and to perform fewer office surgical procedures (Moody et al., 1999). Lin et al. (2002) used NAMCS data to compare NP with PA practice and found that NPs saw a larger proportion of visits, provided more preventive and therapeutic services, and played a larger role in ob-gyn clinics than Pas.

Studies using other techniques, such as chart review and vignettes, have also revealed differences between MDs and NPs in the practice characteristics carried out during patient encounters. In a chart review study comparing NPs and MDs in the primary care of adults with type 2 diabetes, NPs were found to be more likely than MDs to document the provision of general diabetes education and education about nutrition, weight, exercise, and medications (Lenz et al., 2002). In a review of 10 health maintenance items, relatively poor overall compliance was found with rectal examinations, pneumococcal vaccinations, and fecal occult blood tests. Better performance was seen for cholesterol screening and mammography. Patients in this study who were followed by NPs experienced better rates of adherence to prevention measures than patients followed by NP-MD teams, or MDs alone, although all groups had relatively low adherence to prevention guidelines (Pieper & Dinardo, 2001). Inconsistent adherence to diabetes guidelines has been found for NPs studied in isolation (Fain & Melkus, 1994) as well as MDs (Puder & Keller, 2003).

A study by the National Alliance of Nurse Practitioners was conducted in 1992 to evaluate NPs' performance in the delivery of clinical preventive services (Martin, 1992). Two journal articles reported conflicting results of the National Alliance of Nurse Practitioners study. One study reported that nationally NPs were meeting or exceeding most of the preventive service objectives (12 out of 17) recommended in Healthy People 2000, with progress needed in only a few areas (Lemley, O'Grady, Raukhorst, Russell, & Small, 1994).

Another study suggested that NPs have not been as consistent or as frequent in providing preventive services as recommended by Healthy People 2000 and major authorities (Griffith, 1994). In fact, a later study reported NPs devoted less than 1% of patient encounter time to health promotion (Courtney & Rice, 1997). Given the emphasis on health promotion and disease prevention in NP clinical practice, little research has occurred since 1992 regarding NP performance in these areas of clinical prevention. Since 1992, pressure on NPs to see more patients in a given amount of time has increased, and there may be a gap between what NPs believe to be the ideal and what is actually practiced (Birkholz & Viens, 2001).

Although physician adherence to clinical preventive services guidelines has been found to be uneven (Finney Rutten et al., 2004; Gottlieb et al., 2001; Kiefe et al., 2001; Lopez-de-Munain et al., 2001; Ma et al., 2004; Natarajan & Nietert, 2003; Nelson et al., 2002; Solberg et al., 2001; Stange et al., 2000; USPSTF, 2000), NPs and their adherence to guidelines have not been as closely examined. Studies that have specifically examined NPs to gain a better understanding of their delivery of clinical preventive services are few and far between. Furthermore, there has been very little research conducted to assess the knowledge and behaviors specific to NPs in the area of delivering clinical preventive service based on USPSTF guidelines. Additionally, the NPs' attitudes, beliefs, and behaviors about preventive care activities have not been fully examined using a theoretical framework from which effective, theory-based interventions could be developed and tested.

Although the goal to improve the delivery of clinical preventive services in primary care is undisputed, progress in this area is slow. Studies that have examined primary care practice to improve the delivery of clinical preventive services have included NPs under an umbrella term of "clinicians" dominated by physicians and examined under a medical practice model. However, nurses, particularly NPs, by virtue of their nursing philosophy and education as well as their scope of practice, may be unique in their attitudes, beliefs, and behaviors about preventive care. Moreover, strategies designed to improve the delivery of clinical preventive services among clinicians, once again inclusive of NPs, have been developed empirically rather than being based on a sound theoretical understanding of underlying cognitive processes that may influence the extent to which clinicians deliver clinical preventive services to their patients. Examining the variables that may influence nurses' delivery of clinical preventive services based on theory has the potential to inform the design of theory-based interventions to improve the delivery rates among the patient populations NPs typically serve, the diverse and chronically underserved populations such as the elderly, the poor, and those in rural areas.

Cynthia G. Ayres

CLINICAL TRIALS

A clinical trial is a prospective controlled experiment with patients. There are many types of clinical trials, ranging from studies to prevent, detect, diagnose, control, and treat health problems to studies of the psychological impact of a health problem and ways to improve people's health, comfort, functioning, and quality of life.

The universe of clinical trials is divided differently by different scientists. Clinical trials are often grouped into two major classifications, randomized and nonrandomized studies. A randomized trial is defined as an experiment in which therapies under investigation are allocated by a chance mechanism. Randomized clinical trials are comparative experiments that investigate two or more therapies. Nonrandomized clinical trials usually involve only one therapy, on which information is collected prospectively and the results compared with historical data. Comparing prospective data with historical control data introduces biases from many sources. These potential biases are usually of such magnitude that the results of nonrandomized studies are often ambiguous and not universally accepted unless the therapeutic effect is very large. These same biases are not present to the same degree in randomized trials. Recent development and use of mega-trials represents one variation.

The mega-trial is a large, simple, randomized trial analyzed on an "intent-to-treat" basis. In mega-trials randomization serves to achieve identical allocation groups (equal distribution of bias), where there is poor experimental control and large between-subject variation. Results of mega-trials cannot readily be generalized because their conclusions are observations, not causal hypotheses and therefore not testable. Mega-trials can be repeated but not replicated. Mega-trials dispense with the scientific aim of maximum experimental control to remove or minimize bias and instead use randomization to achieve equal distribution of bias between groups.

In clinical drug trials, following approval by the Food and Drug Administration, three phases of clinical trials begin. Phase 1 studies generally establish whether a treatment is safe and at what dosages. Phase 2 studies assess the efficacy of treatments after their safety and feasibility has been established in Phase 1. Phase 3 studies compare effectiveness of Phase 2 treatments against currently accepted treatments.

Some scientists divide clinical trials into three groups: (a) exploratory (initial trials investigating a novel idea), (b) confirmatory (designed to replicate results of exploratory trials), and (c) explanatory (designed to modify or better understand an established point).

Issues surrounding clinical trials include biasing, expense of clinical trials, small sample sizes, and ethical issues. There are many biases that can compromise a clinical trial, such as observer bias, interviewer bias, use of nonvalidated instruments, uneven subject recruitment by physicians, and individual subject factors. Recent concerns have focused on bias in sample selection.

To date, the majority of clinical trials have included a limited segment of the U.S. population, that is, mainly middle-class, married, White males with little to no inclusion of women and minorities. This lack of diversity in trial samples has yielded results that are not always generalizable and effective. Research also has demonstrated bias because of subject factors.

Clinical trials are expensive and resource intensive. As a result, subject numbers are generally limited to the minimum number needed to demonstrate a significant effect not caused by chance. However, small clinical trials may not provide convincing evidence of intervention effects. Small clinical trials are valuable in (a) challenging conventional but untested therapeutic wisdom, (b) providing data on number of events rather than number of patients and thus may be sufficient to identify the best therapy, and (c) serving as a basis for overview and meta-analysis.

To deal with the issue of small sample sizes, meta-analysis is increasingly being used. Meta-analysis (quantitative overview) is a systematic review that uses statistical methods to combine and summarize the results of several trials. Well-conducted meta-analyses are the best method of summarizing all available unbiased evidence on the relative effects of treatment. In a meta-analysis, the individual studies are weighted according to the inverse of the variance; that is, more weight is given to studies with more events. Arrangement of the trials according to event rate in the controls, effect sizes, and quality of the trials or according to covariables of interest provides unique information. If carried out prospectively, the technique provides information on the need for another trial, the number of subjects necessary to determine the validity of past trends, and the type of subjects who might be benefited.

Ethical issues in clinical trials include issues of informed consent, withholding of treatment, and careful monitoring of clinical trial results. Additional issues of informed consent include assuring that subjects thoroughly understand potential risks and benefits of participation and any effects on their care should they decide to withdraw at any point in the study. Issues of withholding treatment include increasing subject risk or subject benefit if there is reasonable evidence of positive effects of the intervention or treatment. Careful monitoring of the effects of interventions or treatment is necessary to stop the trial if there is associated morbidity or mortality and extending the intervention or treatment to the control group in the event of significantly positive treatment effects.

Clinical trials remain the principal way to collect scientific data on the value of interventions and treatment. However, in designing and evaluating clinical trials, rigor of method, including careful evaluation of potential biasing factors, is essential. Meta-analysis provides a summary of all available, unbiased evidence on the relative effects of treatment. However, rigor of methods used to conduct the meta-analysis also must be evaluated.

Dorothy Brooten

COCHRANE REVIEW

Cochrane reviews are systematic reviews that aim to collate all the available evidence that fits predetermined eligibility criteria to assess the effectiveness of health care interventions. The pioneering work of an epidemiologist, Archie Cochrane, has influenced the development of Cochrane reviews. Cochrane was committed to addressing major deficits within the British health care services. In a seminal textbook, Cochrane (1972) stated that "effectiveness" ought to be one of the pillars underpinning health care interventions, and he pointed to a collective need to question the effects of health care interventions through the systematic review of evidence from controlled trials, organized by specialty and subspecialty. In 1974, initial work toward systematically collating evidence from controlled trials began in perinatal medicine, which developed into an international collaboration 10 years later. In 1992, the Cochrane Centre opened in Oxford, United Kingdom, and two Cochrane Review Groups were registered: the Pregnancy and Childbirth Group and the Subfertility Group (The Cochrane Collaboration History, 2010). Twelve months later, the international collaboration now known as the Cochrane Collaboration was launched. The work of the Cochrane Collaboration in preparing and maintaining reviews centers around Cochrane Review Groups of which there are now more than 50 representing a broad range of health care specialities (Green et al., 2008).

Publication of Cochrane reviews on health care evidence has important societal and economical implications. The philosophy of the Cochrane Collaboration centers on the need for the best quality evidence being readily available in an easily accessible, comprehensible format to all stakeholders including policy makers, health care practitioners, patients, their advocates, and carers. Therefore, Cochrane reviews target society at large such that they can be accessed free of charge by all citizens in countries where a national license has been purchased by governments to access the Cochrane Library (Green & McDonald, 2005). Accessibility involves more than making reviews available and easy to find; it includes making reviews easy to interpret by lay health care consumers (Green & McDonald, 2005). To this end, a lay summary of evidence is included in all Cochrane reviews. "Avoiding duplication by good management and co-ordination to maximise economy of effort" is a principle underpinning the work of the Cochrane Collaboration (Green et al., 2008, p. 8). According to Clarke, Alderson, and Chalmers (2002), there is a serious risk of wasting billions of dollars spent on controlled trials if systematic reviews of the findings of individual trials are not collated and made accessible in a standard and structured way.

Health care practitioners face daily challenges concerning the need for their practice to be evidence based. However, they are confronted with information overload because of the increasing number of studies being published worldwide in thousands of medical, scientific, and health-related journals. Cochrane reviews that collate evidence from multiple studies go some way to assisting practitioners to make informed clinical decisions on what interventions work best toward achieving positive outcomes for patients. Cochrane reviews can inform the development of clinical practice protocols, guidelines, and pathways as well as health care policy (Starr, Chalmers, Clarke, & Oxman, 2009; Torloni, 2010).

The vast majority of Cochrane reviews collate evidence relating to specific diseases and treatments (e.g., diabetes, cancer). To date, there are few reviews that specifically focus on nursing practice or nursing specific issues. Davison, Sochan, and Pretorius (2010) noted that out of 117 protocols and completed reviews within the Effective Health Care Practice and the Organisation of Health Care Review Group, 27% ($n = 32$) mentioned nurses or nursing practice in the title or protocol. These results would indicate that Cochrane systematic reviews have some relevance to nursing. However, a conflict exits between the dominant focus on controlled trials and the exclusion of other research methods. Many health care research questions are difficult to test using experimental methodologies, thus creating some conflict for nurses in using Cochrane reviews in clinical practice and in their involvement in conducting Cochrane reviews.

Although there is no Cochrane nursing review group, a Cochrane Nursing Care Field (CNCF) has been established and is one of 16 fields within the Cochrane Collaboration. The aims of the CNCF include becoming a global alliance of those involved in nursing care who wish to promote the preparation of Cochrane reviews on nursing-related topics and the use of Cochrane reviews in nursing practice. The CNCF is coordinated from Adelaide, Australia, with more than 35 members.

Cochrane reviews with their emphasis on controlled trials reflect a positivist paradigm within scientific inquiry. The Cochrane Collaboration strives for methodological excellence in the conduct of reviews. The methodology of Cochrane review is rigorous and includes the following: (1) electronic publication, without word limitations, thus methodological detail can be included; (2) public availability of a preplanned methods section termed “protocol”; (3) application of quality ratings to included studies that seek to limit bias and random errors; (4) a meta-analysis of homogenous results from studies if feasible; and (5) periodic updates to include new evidence if available. The format of the Cochrane review is standardized and structured. The official handbook, *Cochrane Handbook for Systematic Reviews of Interventions* published by the Cochrane Collaboration, details the methodological procedure for preparing and maintaining Cochrane reviews (Higgins & Green, 2009).

Cochrane reviews use more rigorous methods than non-Cochrane reviews (Moseley, Elkins, Herbert, Maher, & Sherrington, 2009; Tricco, Tetzlaff, Pham, Brehaut, & Moher, 2009) and thus are commonly regarded as being of superior quality to other reviews (Shea, Boers, Grimshaw, Hamel, & Bouter, 2006; Starr et al., 2009). In 2009, the *Cochrane Database of Systemic Reviews* received its first official impact factor (5.182) based on citations in 2008 (Cochrane Reviews, 2010). The impact factor is a measure of the frequency with which the “average article” in a journal has been cited in a particular year.

Since the formal establishment of the Cochrane Collaboration, more than 4,000 reviews have been published (Cochrane Reviews, 2010). However, the Collaboration continues to strive to improve review methodology for example the quality assessment of included studies.

In summary, Cochrane reviews provide consumers with readily accessible evidence on the effectiveness of health care interventions.

Josephine Hegarty
Eileen Savage

COHORT DESIGN

A cohort design is a time-dimensional design to examine sequences, patterns of change or growth, or trends over time. A cohort is a group with common characteristics or experiences during a given time period. Cohorts generally refer to age groups or to groups of respondents who follow each other through formal institutions such as universities or hospitals or informal institutions such as a family. Populations also can be classified according to other time dimensions, such as time of diagnosis, time since exposure to a treatment, or time since initiating a behavior. A cohort might be graduates of nurse practitioner programs in the years 1995, 2000, 2005, and 2010 or siblings in blended families. Cohort designs were originally used by epidemiologists and demographers but are increasingly used in studies conducted by nurses and other researchers in the behavioral and health sciences.

In the most restrictive sense, a cohort design refers to a quasi-experimental design in which some cohorts are exposed to a treatment or event and others are not. The purpose of a cohort design is to determine whether two or more groups differ on a specific outcome measure. Cohort designs are useful for drawing causal inferences in quasi-experimental studies because cohort groups are expected to differ only minimally on background characteristics. Recall that a quasi-experimental design lacks random assignment of subjects to groups. Although the groups in a cohort design may not be as comparable as randomly assigned groups, archival records or data on relevant variables can be used to compare cohorts that received a treatment with those that did not. Because simple comparisons between cohorts may suffer from a number of design problems, such as biased sample selection, intervening historical events that may influence the outcome variable, maturation of subjects, and testing effects, a strong cohort design can account for many of these threats to the internal validity of a study.

There are two major types of cohort design: the cohort design with treatment partitioning and the institutional cycles design. In a cohort design with treatment partitioning, respondents are partitioned by the extent of treatment (amount or length) received. In the institutional cycles design, one or more earlier cohorts are compared with the experimental cohort on the variable(s) of interest. The institutional cycles cohort design is strengthened if a nonequivalent, nontreatment group is measured at the same time as the experimental group. A well-planned cohort design can control for the effects of age or experience when these might confound results in a pretest–posttest design or when no pretest measures of experimental subjects are available. Cohort designs might use a combination of cross-sectional and longitudinal data.

The term *cohort studies* broadly refers to studies of one or more cohort groups to examine the temporal sequencing of events over time. Cohort studies may eventually lead to hypotheses about causality between variables and to experimental designs. Most cohort designs are prospective (e.g., the Nurses' Health Study, in which 100,000 nurses were enrolled in 1976 and have been followed since), although some are retrospective.

There are a number of types of cohort studies. The panel design, in which one or more cohorts are followed over time, is especially useful for describing phenomena.

Trend studies are prospective designs used to examine trends over time. In trend studies, different subsamples are drawn from a larger cohort at specified time points to look at patterns, rates, or trends over time. Panel designs with multiple cohorts are used to study change in the variable(s) of interest over time, to examine differences between cohort groups in variables, and to identify different patterns between groups. In a panel study with multiple cohorts, the groups can enter the study at different points in time, and the effects can be differentiated from the effect of being a member of a particular cohort group. A prospective study is a variation of a panel design in which a cohort free of an outcome but with one or more risk factors is followed longitudinally to determine who develops the health outcome. The prospective design is used to test hypotheses about risk factors for disease or other health outcomes. Some authors limit the term "cohort study" to designs in which exposed and nonexposed subjects are studied prospectively or retrospectively from a specific point. A major problem with prospective studies of all types is subject attrition from death, refusal, or other forms of loss. The loss of subjects in a prospective study may lead to biased estimates about the phenomena of interest.

Carol M. Musil

COLLABORATIVE RESEARCH

The word collaborative is derived from the Latin word *collaborare*, which means to labor together (Merriam-Webster, 2010). Therefore, collaborative research implies that a group of persons are "laboring together" to examine an idea, a concept, or a phenomenon. Collaborative research has become more imperative as the world has become more complex through advances in technology, globalization, and escalating health care cost. Further, collaborative research has gained momentum as grant dollars have dwindled, relevant evidenced-based practice has become a professional expectation, and health care clients have become consumers. In response to these societal and professional variables, researchers recognize the need to enlarge their network of potential research partners. Implementation of collaborative research promotes accountability of research funds, energizes the exploration of identified phenomenon, and provides consumers of health care the most current knowledge. Through the inclusion of community leaders, faith-based entities, and clients who are daily addressing the phenomenon, research has become much more relevant and timely. The research questions have increased specificity and applicability and offer answers to complex health care situations.

Collaborative research encourages the formation of research networks that include all members involved with the phenomenon of interest. Each member brings a set of skills and ideas that enhance the exploration of the phenomenon. Academicians contribute knowledge and expertise in research methodology, grant writing, and dissemination through presentations and publications. Clinicians provide hands on application of the current health care practice, insight into the clinical environment and awareness of relevant questions (Gitlin, Lynon, & Kolodner, 1994). Community and faith-based leaders infuse the research think tank with an understanding of the social and political factors influencing the phenomenon as well as awareness of external resources to facilitate the research process and to address the identified needs (Story, Hinton, & Wyatt, 2010). Finally, the incorporation of the client/participants into the research network brings a depth and an understanding that all too often has been overlooked in the research process (Corcega, 1992). Each of these research team members is essential for meaningful and relevant research. Aristotle's maxim "the whole is greater than the sum of its parts" illuminates the synergy that collaborative research produces.

Recently, collaborative research has gained popularity, and there are many reports in the nursing literature of successful outcomes (Bossert, Evans, Cleve, & Savedra, 2002; Chiang-Hanisko, Ross, Ludwick, & Martsolf, 2006; Paton, Martin, McClunie-Trust, & Weir, 2004; Story et al., 2010). Some of the significant rewards of engaging in collaborative research are as follows: utilization of a broader, more in-depth knowledge base, joining of financial resources, empowerment of all persons who intersect with the phenomenon of interest, and expeditious dissemination of findings. Additionally, Adam et al. (2009) noted that collaborative research encourages novice nurse researchers and practicing nurses to take an active role in the research process. Through this team approach, novice researchers and practitioners develop professional skills not only in research but also in networking with a variety of research partners, broadening worldviews and enhancing presentation and writing abilities. Finally, as stated by Denyes, O'Connor, Oakely, and Ferguson (1989), "the advancement of professional nursing requires integration of theory, practice and research and one realistic mechanism to achieve this integration is collaborative nursing research" (p. 141).

As with any process that involves working together, there are challenges that should be addressed to promote successful outcomes for all involved. McCloughen and O'Brien (2006) provided a thorough exploration of challenges that should be addressed when implementing collaborative research, including "communication, environmental issues, politics and power, and organizational cultures" (p. 172). To promote positive and transparent communication and to address environmental issues, research team members should establish short- and long-term goals, schedule routinely meetings with an established agenda, rotate meetings between team members work sites, and maintain minutes of meetings. All research members should have administrative support for their involvement in the research project. Further, to empower all team members to attend the meetings, multiple technological means should be available (conference calls, online and podcasting). The use of technology to promote the collaborative research process has been documented by Wilson et al. (2007) and described as the development of a virtual research process.

To address political and power conflicts that might arise, the research team should establish rules of engagement and determine decision-making processes. If there are any concerns of hidden agendas, these issues should be discussed at the outset and expectations of all team members voiced. All organizational cultures represented in the team should be clearly understood by all members and the means to work within these cultures determined. To promote a positive collegial relationship between team members, an ongoing process of review and evaluation should be in place and apart of every team meeting (McCloughen & O'Brien, 2006). Adams et al. (2009) suggested that care be taken to insure that all team members are clear on the language being used in the team meetings and that all team members are validated regarding the knowledge and skills they contribute to the research project.

The traditional model of collaborative research involves two or more researchers with similar interest. This group of researchers can be from the same organization or from several different organizations. MacDonald, Stodel, and Chambers (2008) serve as an example of collaborative research involving variety of health care professionals and academicians. Avery, Cohen, and Walker (2008) documented collaborative research involving a university nursing and technology faculty. The traditional model provides a means for clarification of a phenomenon through pilot or small research studies and promotes the identification of other potential research partners. Communication, work assignments, and outcomes are enhanced because of minimal team members, similar educational backgrounds, and complimentary skill sets.

This traditional model is foundational for progressing to boarder collaborative research between academics and health care agencies. Examples of this type of research model is well documented in the reports of Allam et al. (2004), Gaskill et al. (2003), McCann (2007), McCloughen and O'Brien (2006), and Paton et al. (2004). Clear and frequent communication, identification of roles and expectations, agreement on a decision-making process, and support of parent organizations of the team members are imperative in promoting the success (McCloughen & O'Brien, 2006). Additionally, Gaskill et al. (2003) suggested that the partnership between the academic and the practice sites be entered into with the understanding that longevity will be needed to build a milieu of trust, collegiality, and sustainability for this research relationship. Finally, Allam et al. (2004) documented the inclusion of clients into this model and the strength this addition brings to the research design, implementation, and outcomes.

Hospital-based research led by nurse executives and involving all levels of nursing service began to be noted in the literature as magnet status for hospitals was established during the mid to late 1980s (Kramer & Shcmalenberg, 2005). The emphasis of achieving magnet status has led to increased specificity of research skills by all nurses affiliated with hospital organizations that have or are seeking to gain magnet status. Further, this change in hospital culture has led to increased collaborative research within hospital organizations, streamlining of research dollars, and increased dissemination of research findings.

The most inclusive collaborative research model is that of community-based participatory research, which involves academics, practice, and community members. Corcega (1992) stated that the strength of this model is the empowerment of community members that assist them to become "educated, self-reliant citizens capable of making decisions regarding their own future..." (p. 186). The literature reflects several robust and successful projects of this nature (Foster & Stanek, 2007; Minkler, Vasquez, Chang, & Miller, 2008; Story et al., 2010). Story et al. (2010) emphasized the utilization of this model in addressing marginalized and vulnerable populations where lack of trust has often prevailed and bridging the gap between the "outsider and the insider" (p. 117). Shoultz et al. (2006) provided a comprehensive review of challenges that might be experienced when implementing community-based participatory research and provide suggestions for proactively addressing these issues.

A final model involves broadening of any of the previously discussed models to include international partners. Melkers and Kiopa (2010) documented the professional growth of all members involved in international collaborative research project. Jones, Wilson, Carter, and Jester (2009) provided a thorough discussion of the benefits and challenges to consider in developing a successful international research team.

The attributes offered through successful collaborative research become more apparent as expectations call for research that is of the highest quality, financially savvy, and capable of producing credible and applicable outcomes. To maximize the potential of collaborative research, research partners should establish clear communication guidelines, team goals, outcomes, role expectations, and methods to work with the organizational powers and cultures. To ensure maximum effectiveness, collaborative teams should routinely evaluate the research process (McCann, 2007; McCoughen & O'Brien, 2006). Happell (2010) highlights methods to ensure that each team member maintains ownership of their contributions to the research project and encourages a written document that verifies the following key elements: member names with indentified expertise and organizational affiliation, roles, determination of authorship, solutions for potential change in dynamics of team membership (illness/move), and methods for conflict resolution.

Kaye Wilson-Anderson
Joanne Warner

COMFORT THEORY

Providing comfort to patients has a long history within the mission of nursing. Comfort has been conceptualized as a holistic outcome of nursing care. It has been defined as "the experience of being strengthened by having needs for relief, ease, and transcendence addressed or met in four contexts of experience: physical, psychospiritual, environmental, and sociocultural." These four contexts for experiencing comfort are derived from the literature on holism (Kolcaba, 2003). The rationale for providing comfort to patients and their families comes from (a) the historical mission of nursing to provide comfort, (b) the satisfaction that this kind of care gives recipients and the deliverers of care, (c) the efficiency of using a consistent pattern for care planning, and (d) the strengthening component of comfort which is derived from its original meaning (Kolcaba, 2003).

Comforting care consists of goal-directed activities (the process of comforting) through which enhanced patient and/or family comfort (the desired end product or outcome) is achieved. The process is initiated by the nurse and/or other team members after an assessment of the comfort needs of the patient/family. Because the specified product or goal is enhanced comfort, the process is evaluated by comparing comfort levels before and after interventions that are targeted toward comfort. The process is incomplete until the product of enhanced comfort is achieved (Kolcaba, 2003).

Within the structure of nursing knowledge, the technical definition of comfort provides precision for assessment, intervention, and evaluation of interventions that go beyond technical nursing skills and physician orders. The importance and effectiveness of comforting interventions, such as coaching, encouragement, guided imagery, environmental manipulation, back massage, therapeutic presence and listening, and so forth, may be quantifiable and visible within the patient record. From analysis of these data, evidence for best practices and policies may be derived.

Kolcaba (2003) provides a theoretical framework for practicing comforting care and for generating nursing research about comfort. The theory states that interventions should be designed and implemented to address unmet comfort needs of patients and their families. An assumption is that comfort is a basic human need; therefore, patients and families often assist efforts toward enhancing comfort.

The effectiveness of comforting interventions is dependent on the context of existing intervening variables. Intervening variables are factors that recipients bring to the situation and upon which team members have little influence, such as financial status, existing social support, prognosis, and religious beliefs. Enhanced comfort strengthens patients and their families during stressful health care situations, thereby facilitating health-seeking behaviors (HSBs).

Institutional integrity was defined by Kolcaba (2003) as the quality or state of health care organizations being complete, whole, sound, upright, professional, and ethical providers of health care. When patients/families engaged in HSBs, they heal faster, learn more, and increase their functional status. Thus, comfort theory (CT) states that institutions such as hospitals, agencies, and private practices would demonstrate improvements in institutional outcomes, such as fewer readmissions or recurrences of health problems, higher patient satisfaction, and desirable cost–benefit ratios. Also, institutions that provided sufficient support for nurses to practice comforting care would demonstrate increased nurse loyalty and productivity and less absenteeism because this kind of nursing care is less stressful and more satisfying, not only for patients/families but also for nurses.

CT focuses on enhancing patient/family comfort for altruistic and pragmatic reasons. Patients/families want to be comforted by nurses in stressful health care situations, and CT reminds nurses about the strengthening aspect of comfort interventions. Because comfort theoretically is related to subsequent desirable health and institutional outcomes, the outcome of enhanced comfort is elevated in stature among other more technical and narrow outcomes. It is a desired, holistic, value-added, and (often) nursing-sensitive outcome that is congruent with recent mandates to measure nursing effectiveness in terms of positive patient/family goals (Magvary, 2002). CT also is nurse-friendly because it places responsibility and incentives on health care institutions to provide working conditions conducive to comforting care. Improving working conditions is the underlying rationale for the inception of the Magnet Status award by the American Nurses Association (Kolcaba, Drouin, & Kolcaba, 2006). Suggestions and rationale for teaching comforting care and using CT as a framework for ethical decision making are in Kolcaba's (2003) book and on her Web site (www.TheComfortLine.com).

CT guides nurse researchers to test relationships between particular holistic interventions and comfort. Several empirical tests of the first part of comfort theory (CT) have been conducted by Kolcaba (2003). These comfort studies demonstrate significant differences between treatment and usual care groups on comfort over time. The following interventions were tested: (a) types of immobilization for persons after coronary angiogram, (b) guided imagery for women going through radiation therapy for early breast cancer, (c) cognitive strategies for persons with urinary frequency and incontinence, (d) hand massage for persons near end of life, and (e) generalized comfort measures for women during first and second stages of labor. In each study, interventions were targeted to all attributes of comfort relevant to the research settings. Comfort instruments were adapted from the General Comfort Questionnaire (Kolcaba, 2003) using the taxonomic structure of comfort as a guide, and there were at least two measurement points, usually three, to capture changes in comfort over time.

CT guides researchers to test relationships between comfort and HSBs. These relationships have been consistently positive, and comfort has found to be a good indicator for those who do well in therapy or new regimens. Therefore, nurses have a pragmatic rationale for enhancing their patients' comfort. Third, it guides nurses to test relationships between HSBs and institutional outcomes (such patient satisfaction, the national and publicized benchmark for "best hospitals").

To demonstrate that providing comfort is an still an important mission for nursing, more tests of CT must be conducted. Choices for desirable HSBs could include increased functional status, increased T-cell count, faster progress during rehabilitation, faster healing, or peaceful death (when appropriate). In addition to meeting benchmarks such as higher patient satisfaction scores or decreased nurse turnover, institutional outcomes could include decreased length of stay for hospitalized patients, decreased readmissions for the same or related medical problem, and general cost–benefit analyses for specific evidence-based protocols. Improved institutional outcomes are of interest to administrators, funding agencies, third-party payers, and policy makers.

A large number of comfort management strategies and guidelines have been created by Kolcaba, and each component is available on her Web site. These strategies include but are not limited to comfort contracts, comfort rounds, comfort assessments, comfort checklists, comfort instruments for small children and patients who are nonverbal or unconscious, comfort management competency tests, instruments for research, and so forth.

Katharine Kolcaba

COMMUNITY MENTAL HEALTH

Over the past 50 years, the community mental health movement has had a tremendous impact on psychiatric nursing, taking psychiatric nurses into communities and freeing them from their almost exclusive practices in large state hospitals. Nursing research in the area of community mental health has steadily increased, the United Kingdom having contributed most to this body of literature, especially in recent years. Historic influences in the United States and United Kingdom created different climates from which nursing research in each of these countries emerged.

From the early nineteenth century until the 1960s, mental hospitals, or "asylums," constituted the major treatment resource for the mentally ill in both the United States and United Kingdom. Advances in the use of psychotropic medications and government policy directives in each country spurred movement of mentally ill patients into the community. The historic report, *Action for Mental Health*, presented to the U.S. Congress in 1961, recommended a shift to community-based care. This was followed in 1963 by the enactment of the Community Mental Health Centers Act, which authorized $150 million in federal funds to develop comprehensive community mental health centers (Miller, 1981). The United Kingdom followed suit in 1962 when British politician Enoch Powell presented his *Hospital Plan for England* to Parliament; however, it was not until the publication of the 1975 White Paper, *Better Services for the Mentally Ill*, that any real increase in resources was initiated (Bonner, 2000; Wright, Bartlett, & Callaghan, 2008).

The shift from hospital to community posed challenges for psychiatric nursing in both countries. Most psychiatric nurses in the United States were educated through hospital-based programs, making them ill equipped to take on the demands of an expanded community role. Although the findings of several early descriptive studies (Hess, 1969; Hicks, Deloughery, & Gebbie, 1971) show psychiatric nurses functioning in diverse roles, nursing leaders (Mereness, 1983) during this period expressed concern that too often nurses in community mental health adopt "residual roles," resulting from their lack of education in psychiatric theory and unequal status among fellow professionals.

In the United Kingdom, social workers were the primary professionals delivering care to mentally ill patients in the community. Nursing was represented by the part-time activity of hospital-based psychiatric nurses who were seen merely as a mechanism through which psychiatrists could extend their authority beyond the confines of the hospital (Bonner, 2000; Wright et al., 2008). In both countries, the main role for community psychiatric nurses during these early years was the task of administering depot injections to patients with severe mental disorders.

The 1970s and 1980s were characterized by role differentiation and expansion for community psychiatric nurses in both countries. In the United States, there was recognition of the need for advanced educational preparation of psychiatric nurses to meet the challenges of this evolving role (DeYoung & Tower, 1971). The findings of one descriptive study (Davis & Underwood, 1976) show that although half of the nurses employed in four community mental health centers earned a bachelor's degree and provided some consultation and counseling, most of their time was spent performing traditional functions. With increased educational opportunities, funded largely by the National Institute of Mental Health in the 1980s, psychiatric nurses grew more sophisticated and diversified. They began to function as psychotherapists for individuals, families, and groups and to serve as case managers and coordinators of community services. Psychiatric home care nursing also began to flourish during this period as reimbursement for these services became available (Fagin, 2001). Although nursing research related to community mental health was still scarce, an early intervention study (Slavinsky & Krauss, 1982), funded by the National Institute of Mental Health, characterized nurses' commitment to the care of psychiatric patients in the community and their skill in developing innovative programs for this population.

The drive for autonomy for community psychiatric nurses in the United Kingdom was away from psychiatry and "general nursing." Their "professionalization" and expansion was largely achieved through their successful incursion into primary health care and distancing from mental health teams. Government initially supported community psychiatric nurses' efforts in building new relationships with general practitioners and even funded their training (Godin, 2000). Community psychiatric nurses expanded in number and also in the range of therapeutic approaches used in their practices. As their self-image as professionals and their relationships with general practitioners grew, however, their caseloads became composed of patients with less severe problems (Godin, 1996). The findings of one U.K. study (Barratt, 1989) show community psychiatric nurses' self-perceived roles becoming more differentiated, emphasizing prevention, counseling, and a variety of therapies for certain patient populations. Another study (Wetherill, Kelly, & Hore, 1987), investigating the effectiveness of a structured home intervention to improve patient compliance in alcohol treatment and recovery, demonstrates the growing ability of community psychiatric nurses in the United Kingdom to develop innovative interventions and expand their practices to include a varied clientele base.

In the United States, psychiatric nurses continued to develop pivotal roles in a variety of community treatment modalities. In one national survey of assertive outreach programs, findings show that 88% had a psychiatric nurse as an integral member of the treatment team (Deci, Santos, Hiott, Schoenwald, & Dias, 1995). Over time, psychiatric clinical nurse specialists became recognized as independent practitioners, eligible for third-party reimbursement, and active in caring for seriously mentally ill patients (Iglesias, 1998; White, 2000); however, research addressing specific psychiatric nursing interventions for this population was still quite limited (Beebe, 2001; Rabbins et al., 2000). The "Decade of the Brain" in the 1990s brought the medicalization of psychiatric practice. In response to the challenge of integrating biologic knowledge into clinical practice, psychiatric nurses working in community mental health centers and in private practice in the United States sought prescriptive authority. Current nursing research reflects efforts to understand prescribing practices of advanced practice psychiatric nurses (Talley & Richens, 2001) and identify barriers to prescriptive practice (Kaas, Dahl, Dehn, & Frank, 1998).

By the 1990s, community psychiatric nurses in the United Kingdom were numerically the most dominant occupational group within community mental health care; however, this also meant that they were perceived as responsible for many of its failures. Criticism was primarily directed toward their decision to shift focus away from the care of patients with severe mental illnesses in favor of work in primary health care. Many also questioned the effectiveness of their work in primary care, contending that counseling-based interventions were of unproven worth with people experiencing minor, self-limiting problems, and were not cost effective (Hannigan, 1997). Not only were community psychiatric nurses directed to reappraise the value they placed upon serving those with severe mental illness, they were also directed to develop and apply evidence-based interventions with this population.

One needs only to scan recent reviews of nursing research to gain an appreciation of the effort that has and is being put forth by psychiatric nurses in the United Kingdom to meet this mandate. The nursing literature is replete with studies investigating the clinical impact of specific interventions with severely mentally ill patients. Examples include nursing interventions for early detection of medication side effects (Jordan, Tunnicliffe, & Sykes, 2002), for identifying psychiatric illness in the elderly (Waterreus, Blanchard, & Mann, 1994), for providing sex education to mentally ill patients (Woolf & Jackson, 1996), for using an "insight program" with patients diagnosed with schizophrenia (Pelton, 2001), and for implementing a self-management model of relapse prevention for psychosis (Stevens & Sin, 2005). Findings from a systematic review of 52 randomized controlled trials of mental health interventions delivered by the U.K. mental health nurses (Curran & Brooker, 2007), such as family work with families of patients with schizophrenia (Leff, Sharley, Chisholm, Bell, & Gamble, 2001) and transitional discharge planning (Reynolds et al., 2004), show that psychiatric mental health nurses are involved in the delivery of a wide range of evidenced-based interventions in the community.

Today in the United States, the call by the U.S. Surgeon General (U.S. Department of Health and Human Services, 1999) and the Presidents's New Freedom Commission on Mental Health (2007) to reduce stigma and disparity related to accessing community mental health care services has spurred nurses' interest in stigma research (Halter, 2004a, 2004b; Raingruber, 2002); however, movement toward understanding and reducing stigma and disparity is still at its infancy, and nursing research in these areas has been qualitative and nonexperimental (Pinto-Foltz & Logsdon, 2009). Until these research areas expand, it will be difficult for nurses to plan and test community interventions to decrease stigma and/or disparity and to understand how such interventions work. Research priorities related to stigma and disparity are nonetheless fertile grounds for future nursing research in community mental health.

Wendy Lewandowski

COMPARATIVE EFFECTIVENESS RESEARCH

Comparative effectiveness research in nursing is the generation and synthesis of evidence generated through prospective and retrospective nursing studies with either primary or secondary data sources by

- comparing the benefits and harms of alternative nursing methods to prevent, diagnose, treat, and monitor a clinical condition or to improve the delivery of care;
- comparing the same nursing method(s) between different patient groups;
- comparing the same nursing method(s) between different clinical environments; or
- comparing one or more nursing methods across combinations of treatments, patient groups, and/or environments.

At the clinical level, comparative effectiveness research investigates nursing methods (preferably already shown to be efficacious in randomized controlled trials) in real-world settings; that is, under ordinary and variable conditions, when prescribed by licensed nurses with varying degrees of expertise and practicing across the spectrum of health care settings, to treat a heterogeneity of patients. Comparative effectiveness research in nursing aims to discover the best nursing methods for personalizing care to individual patients by broadening the evidence base and by providing more, better, and detailed information with which to craft a nursing management strategy for each individual patient. The ultimate purpose of comparative effectiveness research is to assist consumers, clinicians, purchasers, and policy makers to make informed decisions that will improve health care at both the individual and population levels.

Ivo Abraham
Sally Reel

COMPLEMENTARY AND ALTERNATIVE PRACTICES AND PRODUCTS

A large percentage of persons worldwide are using complementary and alternative practices and products (CAPPs), referred to also as "complementary and alternative medicine" (CAM) and, more recently, as "integrative medicine" (National Institutes of Health, National Center for Complementary and Alternative Medicine [NIH/NCCAM], 2010d). The term "integrative health care" is increasingly used by clinicians and researchers, reflecting findings in the survey literature that suggest most people use CAPPs in conjunction with rather than as an alternative to conventional or mainstream health care services (NIH/NCCAM, 2007b).

Despite any confusion in use of terms, recent surveys (Barnes, Bloom, & Nahin, 2008; NIH/NCCAM, 2007a) indicated that a significant percentage of the adult population in the United States (38.3% or approximately 4 in 10 adults) and a small percentage of children (12% or approximately 1 in 9 children) have used or are using a variety of these ancient and modern CAPPs to treat symptoms and conditions, ranging from back and other musculoskeletal pain to anxiety and/or sleep disorders. A parallel trend is the increasing use of CAPPs among senior citizens, specifically in the aging U.S. population. In recent national and regional sample studies, 62% to 88% of people 65 years and older used at least one CAPP modality compared with 46% of those younger than 65 years ($p < .001$; Ai & Bolling, 2002; Cheung, Wyman, & Halcon, 2007; Ness, Cirillo, Weir, Nisly, & Wallace, 2005). The 2007 National Health Interview Survey data also provide the first definitive report for out-of-pocket costs for complementary and alternative therapies among adults in the United States. The total, $33.9 billion, equals 1.5% of total 2007 U.S. health care expenditures (Nahin, Barnes, Stussman, & Bloom, 2009).

In response to the increasing interest of the American people in the healing potential of CAPPs, the federal government created in 1992 the Office of Alternative Medicine, elevated in 1998 to the NCCAM because the Congress believed that the widespread public use of CAPPs in the absence of scientific evidence warranted a more focused research effort at NIH (NIH/NCCAM, 2010c). The mission of NCCAM is to define, through rigorous scientific investigation, the usefulness and safety of CAPPs and the role they play in improving health and health care. The anecdotes about efficacy and effectiveness of practices for which there are not plausible explanations are insufficient today, thereby giving importance to well-designed and well-executed research. Beginning with the appointment of the first director of NCCAM in May 1999 and the publication of its first strategic plan in September 2000, NCCAM has funded both extramural and intramural research focused on CAPPs-related clinical, translational, and basic research on the efficacy, safety, and mechanisms of action of diverse CAM modalities (NIH/NCCAM, 2010b). Celebrating its 10th anniversary in February 2009, NCCAM boasts a Web site (http://nccam.nih.gov/) that provides educational materials in written and audiovisual form.

In addition, NIH has collaborated with the U.S. National Library of Medicine to create a Web site in a "town hall" platform. Its goal is to create an across-the-lifespan "informed consumer" by providing the best evidence possible and the most reliable resources available that are relevant to the health of the U.S. population. Providing such a platform provides the U.S. populace with opportunities and access to primary, secondary, and tertiary health prevention and maintenance measures (NIH/National Library of Medicine, 2010).

The term complementary medicine/therapies was introduced during the decade of the 1970s in the United Kingdom and refers to those practices and products that link the most appropriate therapies to meet the individual's physical, mental, emotional, and spiritual needs. In some cultures, the term "alternative" refers to those practices and products that are provided in place of conventional or allopathic health care, many of which are outside the realm of accepted health care theory and practices in the United States. Today CAPPs re grouped into the broad categories of natural products, mind–body practices, manipulation and body-based practices, and other CAM practices, which include movement therapies (e.g., Trager psychophysical integration, Feldenkrais method), energy therapies (e.g., therapeutic touch, qi gong, electromagnetic energy fields as in magnet therapy), traditional healers as found in the Native American medicine man, and whole medical systems such as traditional Chinese medicine (NIH/NCCAM, 2010d).

To promote research in CAPPs, the Office of Alternative Medicine initially established 10 research centers across the country, one of which was directed by a nurse. The Center for the Study of Complementary and Alternative Therapies at the University of Virginia was thus established in 1993 as one of the original NIH-funded centers to stimulate research in this emerging field.

Building upon this successful initiative, NCCAM has continued to increase the number of research centers, aligning the focus of these with its mission and legislative mandates. NCCAM now has developed five primary research training centers to support national and international research projects, all of which are focused on elucidating mechanisms of action of CAPPs as defined within each of the major modality categories (NIH/NCCAM, 2010b). For example, recent studies include, but are not limited to, exploring the mechanisms and effects of metabolic and immunologic effects of meditation, effects of various CAPPs research on autoimmune and inflammatory diseases, and chiropractic manipulation (NIH/NCCAM, 2010b). State-of-the-science information on selected CAPPs and searches of federal databases of scientific and medical literature may be found on NCCAM's Clearinghouse Web site (http://nccam.nih.gov/).

Selected CAPPs have been studied sufficiently to provide conclusive evidence of effectiveness. For example, there are data to support a number of behavioral and relaxation practices used to treat pain and insomnia. However, data currently available are insufficient to be definitive that one practice or procedure is more effective than another for a given condition. Yet, because of psychosocial differences among persons, cultural diversity, and variations in personality characteristics among individuals, one procedure or product may be more suited than another for a given person (Cuellar, Aycock, Cahill, & Ford, 2003; Mackenzie, Taylor, Bloom, Hufford, & Johnson, 2003; NIH Technology Assessment Panel, 1996; Owens, Taylor, & DeGood, 1999).

A challenge for health care professionals today is to become and remain informed regarding indications and contraindications for use of the myriad of procedures and products that patients are using, including the potential interactions of natural products with pharmaceuticals, foods, and lifestyles. The movement to offer content about CAPPs within the curricula of schools of nursing, medicine, and pharmacy continues to be evident (Stratton, Benn, Lie, Zeller, & Nedrow, 2007). Among faculty responsible for the content, there appears to be not so much a lack of agreement about integrating practice aspects of evidence-based CAPPs into the curricula (Gaydos, 2001; Kligler, 1996) as there is acknowledgment of the challenges. Such challenges include the need for qualified faculty, the crowded curricula content, a lack of defined best practices in CAPPs, and the postgrant sustainability of programs funded to integrate CAPPs into the curricula (Lee et al., 2007). Addressing these challenges remains core to efforts expended by NIH/NCCAM to support integration of evidence-based information about CAPPs into professional schools' curricula (Pearson & Chesney, 2007; Rakel, Guerrera, Bayles, Desai, & Ferrara, 2008; Yildirim et al., 2010). Such curricula will need to support the education of health care professionals about the science behind CAPPs, the evidence for effectiveness and safety, the interactions among CAPPs and with other health care modalities, and the pharmacology of biological agents (Nottingham, 2006).

The basis for research into CAPPs should not be adversarial, that is, "CAPPs versus mainstream health care modalities," but rather the scholarly inquiry into whether or not an intervention is effective, safe, and contributes to the overall well-being of the consumer (NIH/NCCAM, 2010b). Rigorous research involving any of these practices and products can be across the spectrum of basic research, translational research, efficacy studies, and effectiveness research. Research often begins with basic questions: How does it work? How do individual differences, as assessed by a given measurement tool, influence what happens or does not happen in the use of a particular therapy for management of a specified symptom? From general questions such as these, coupled with extensive literature reviews and consultation with experts, more specific questions about the use of these therapies in patient care evolve to guide investigators' research.

Focusing on individual differences among patients when assessing use, efficacy, and effectiveness of CAPPs permits the investigator to analyze disparate patient care findings and synthesize these into questions that will add to the body of evidence about these therapies (Owens et al., 1999). Findings resulting from research studies testing the efficacy of CAPPs will continue to lead to knowledge that can be useful in making reliable predictions and linking appropriate therapies to patients for promotion of health or symptom management (Lin & Taylor, 1998).

The definition of what constitutes CAPPs will continue to evolve as researchers complete rigorous scientific studies in this area. In an effort to empower consumers and encourage health care professionals to stay current with advances in CAPPs research and clinical application, NCCAM launched a Web portal dedicated to a "Time to Talk" campaign (NIH/NCCAM, 2008). Currently, this site provides tips for consumers to discuss use of CAPPs with their health care providers and suggestions for health care providers to elicit CAPPs usage information from their patients. The goal is informed health care that promotes safety and best care practices in health care settings.

In addition to the need for rigorous research on CAPPs, inclusion of education about these modalities in the curricula for health care providers and development of resources for consumers need to exist for the development of competency standards and measures involved in credentialing health care providers in CAPPs practice. Of course the issues of liability will need to be addressed.

Although consumers today are empowered to play a larger role in their health care outcomes, a large number of nurses and other health care professionals still lack knowledge about CAPPs, thus creating a barrier to integrative health care. Rigorous clinical studies are needed to provide evidence of CAPPs treatment efficacy for many symptoms and conditions. Research monies are available for competitive research proposals through the NCCAM and other agencies within the NIH. Consumer demand continues to drive integration of selected CAPPs into the conventional health care system as well as to prompt the need for continued rigorous science in this field. These factors foster optimism and increase the potential for additional evidence-based holistic and supportive care, facilitating the safe integration of selected CAPPs into an integrative health care environment.

Ann Gill Taylor
Victoria Menzies

CONCEPT ANALYSIS

Concept analysis is a strategy used for examining concepts for their semantic structure. Although there are several methods for conducting concept analysis, all of the methods have the purpose of determining the defining attributes or characteristics of the concept under study. Some uses of a concept analysis are refining and clarifying concepts in theory, practice, and research and arriving at precise theoretical and operational definitions for research or for instrument development. Concept analysis has been used in other disciplines, particularly philosophy and linguistics, for many years. However, the techniques have only recently been "discovered" by nurses interested in semantics and language development in the discipline.

Concept analysis is a useful tool for nurses conducting research. Because the outcome of a concept analysis is a set of defining characteristics that tell the researcher "what counts" as the concept, it allows the researcher (a) to formulate a clear, precise theoretical and/or operational definition to be used in the study; (b) to choose measurement instruments that accurately reflect the defining characteristics of the concept to be measured; (c) to determine if a new instrument is needed (if no extant measure adequately reflects the defining characteristics); and (d) to accurately identify the concept when it arises in clinical practice or in qualitative research data.

Concept analyses were relatively rare in nursing research until the early 1980s but have increased dramatically in number over the past two decades. Concept analysis is particularly relevant to a young science such as nursing. The process, regardless of method, requires rigorous thinking about the language used to describe the phenomena of concern to the discipline. Doing a concept analysis causes the researcher to be much more aware of and sensitive to the use of language in research. A conscious awareness of the language chosen to represent phenomena is necessary if nursing scientists are to develop a comprehensible body of knowledge for the discipline.

It is also necessary for thoughtful practitioners to be aware of the language of the discipline. How nurses think about and describe the problems and solutions relevant to their practice is of paramount importance in helping the consumer of nursing care and the policymakers who influence the practice milieu to understand what nursing is and what nurses do. If nurses do not have a central core of well-defined concepts to describe their practice, then confusion and ambiguity will persist, and the development of nursing science will suffer.

Concept analysis has become a useful adjunct to nursing research. The outcome of a concept analysis significantly facilitates communication between researchers and practitioners alike. By specifying the defining characteristics of a concept, the researcher or practitioner makes it clear what counts as the concept so that anyone else reading about it or discussing it understands what is meant. Being clear about meaning allows better communication between scientists and practitioners about the usefulness and appropriateness of nursing language.

There is considerable discussion in the literature about which method of analysis is the most useful. Regardless of the method used, concept analyses can contribute significant insights into the phenomena of concern to nurses.

Kay C. Avant

CONCEPTUAL MODEL (FRAMEWORK)

Conceptual models (sometimes referred to as conceptual frameworks or grand theories) are abstract representations of phenomena of interest to the discipline. Specific theories can be derived from these conceptual models. The conceptual models themselves are not testable, but the theories derived from the models may be tested. These grand theories provide global perspectives of the discipline and offer ways of viewing nursing phenomena on the basis of these perspectives. Examples of conceptual models in nursing are those of Martha Rogers, Imogene King, Hildegarde Peplau, Jean Watson, and Florence Nightingale. Descriptions of several of these models are contained elsewhere in this text.

Joyce J. Fitzpatrick

CONSORTIAL RESEARCH

Consortial research is a form of collaborative research that can be used to increase the quantity and quality of nursing research within clinical settings. It involves cooperative efforts among researchers at several institutions. The sites have formal, well-defined administrative and working relationships that spell out agreed-upon roles and responsibilities.

Consortial studies are done for a number of reasons: (a) to achieve the required sample size when studying a low-prevalence disease; (b) to increase the ethnic diversity or other characteristics of a sample, thus increasing generalizability of results; (c) to shorten the time line for conducting the study by simultaneously recruiting subjects at multiple sites; (d) to provide mentoring to more junior researchers and staff nurses; (e) to share resources, tasks, and costs when external funding is not available; and (f) to increase opportunities for replication and dissemination.

Consortial studies may be conceived by one or a few investigators, who draft the initial proposal then recruit colleagues at other sites to participate in the study. These other investigators may be involved in helping to refine the proposal before it is submitted for funding. When the purpose of the consortium is more focused on mentoring junior colleagues or is a way to share resources and costs, it is more likely that development of the proposal will be a group endeavor from the start. In the latter case, the choice of topic may be generated by an advisory or steering committee. Whichever approach is taken, the pool of ideas generated by expertise from several institutions creates synergy that leads to more creative and productive research.

To conduct these multisite studies, one site usually serves a coordinating function for the study. Most often in externally funded studies, the coordinating center is responsible for identifying or developing questionnaires or other data collection forms, for data collection and processing procedures, and for receiving and centrally analyzing the study data. The oversight role of the coordinating center includes development and implementation of a quality control plan to assure standardization of sample identification, recruitment, and data collection procedures. Scientific issues for the conduct of the study are usually managed by a steering committee, often composed of the principal investigator from each participating site and a few key individuals at the coordinating center. Standing or ad hoc subcommittees of the steering committee are often formed to propose standards and to oversee the work on specific aspects of the study. For example, the subcommittees bring proposals for publications and presentations, participant safety and end points, or clinical aspects before the steering committee for approval. The degree to which the steering committee is involved in development of protocols, questionnaires, and so forth, as opposed to approving those developed by the coordinating center, varies by study and the reason the consortium was created.

In a consortium formed primarily for the purpose of sharing resources, mentoring junior researchers, replicating a previous study, or disseminating results, the steering committee may be composed of representatives appointed by each participating institution. In such cases, the steering committee often serves the purpose of setting priorities for the activities of the consortium. Funding of studies conducted by a consortium may take several forms. When external funding is involved, the two most common types are (a) providing one large grant to a coordinating center, which then subcontracts with each clinical site, and (b) providing individual grants to each participating institution with a separate grant to the coordinating center. The first approach gives the coordinating center budgetary leverage when a site is not performing up to par. This is an advantage for involving a new site or increasing the number of subjects enrolled at existing sites by redistributing funds from the nonperforming site. The second approach requires that each site meet the commitments for the good of the overall study. A third model, used when external funding is not available, shares the cost of the research among participating institutions within the consortium.

In medical treatment research and public health prevention research, consortial arrangements have been a preferred structure for large randomized trials that must recruit substantial populations in a relatively short time, provide intervention, and have sufficient follow-up time to generate adequate statistical power to compare the effects of treatment on the study outcomes.

It may be expected that consortial research will increase as nursing researchers do more experimental research. Another factor that may promote consortial research in nursing is the changing health care system. As health care systems increase the number of contractual arrangements in attempts to provide cost-effective, integrated care across the continuum of patient needs, consortial research is likely to become more common.

Barbara Valanis

CONTENT ANALYSIS

Content analysis is a data analysis technique that is commonly used in qualitative research, which focuses on structuring particular topics or domains of interest from unstructured data. It is a time-consuming process that involves organizing, identifying, coding, and making categories from patterns of data that are reflective of the topics. The topics or domains of interest are generated by the researcher on the basis of data derived from collection source and are also often referred to as category labels. Historically, early content analysis focused on linguistic and observational data. The earlier or classic content analysis included techniques for reducing texts to a unit-by-variable matrix and then analyzing the matrix quantitatively to test hypotheses (Denzin & Lincoln, 2000). In addition to information derived from interviews and casual or structured observations, researchers may analyze written text from special documents, archival records, field logs, and diaries or may develop schemes to analyze visual data from pictures or videotapes.

Content analysis begins with reading the text or written transcription of an interview, notes from an observation, or some other mode of data collection. The investigator reads the completed text and determines the main ideas or topics of the transcription or observation. The investigator then rereads the text and numbers and assigns a code to each segment or group of lines from the transcription. Sometimes this may also be called labeling. Segments may consist of a single word or line, multiple words or lines, one or more paragraphs, or a pictorial schema and may vary according to the chosen topic or topics. The codes developed by the investigator reflect some commonality, such as an action or behavior, an event, a thought, a concept, and so forth. Line segments or groups of lines are separated and are grouped into categories, and the categories are grouped according to the topics that were identified by the investigator.

Topics or domains of interest may be chosen before a study, as with a focused study, or generated after the first interview and based on the inquiry or subjective findings. A focused qualitative study centers on one particular area of interest or intent, such as metaphorical analysis or feminist research, or it may focus on a particular phenomenon like leadership style, body piercings among adolescent girls, or a demonstration of how caring activities are performed.

The researcher may also choose to develop topics after a first interview or observation. Sometimes the topics seem to arise naturally from the data, whereas at other times the researcher must decide on and develop the topics from the information given. Developing a topic may be similar to making an index for a book or file labels (Patton, 2002). The researcher reads through the transcript of the interview or observation and begins to sort and organize the interview data according to likenesses and similarities. The researcher usually gets a sense of the main topics that pervade the text soon after the transcribing process is complete and after the first reading. This organization of the data may be done by hand or by using one of the many computer software packages that are available to assist organization of qualitative data.

Most qualitative research suggests using between 10 and 15 main topics per study (Denzin & Lincoln, 2000; Patton, 2002). They caution against making topics too specialized as only very small amounts of data will be able to fit into each. On the other hand, too many topics can cause confusion, and the researcher may have difficulty in remembering what categories go into each topic as the study progresses and more data are collected. With each subsequent interview or observation, the topics may be combined or subdivided into multiple categories as the need arises. As repetitive patterns arise, relationships between the categories and then between topics may be seen. Often, the relationships may occur at the same time or be concurrent with each other. For example, in a study of adolescent face care, the topics “blemish care” and “facial scrubbing” are related and occur at the same time. In the same study, the topic “facial preparation” occurs or is antecedent to the topics of “blemish care” and “facial scrubbing,” whereas the topical area “making up the face” may occur as a consequence of one of the earlier categories that were formed. Some researchers choose to quantify part of the analysis by counting frequency and sequencing of particular words, phrases, or topics.

The major reliability and validity issues of content analysis involve the subjective nature of the researcher-determined topics or category labels. What should be included within each topic should be clearly defined and should be clearly different from the others so that the results are mutually exclusive. The easiest way to determine reliability in a study that uses content analysis is to have two or more readers, other than the researcher, agree that the topics are appropriate for a particular study and that data can easily be organized under each. This is typically carried out by having the researcher randomly choosing a part of the study and having the readers look over the text and the topics independent of each other. A consensus of the readers would indicate the study's reliability.

Validity in content analysis can be achieved by determining the extent that the topics represent what they are intended to represent. If the topics are based on a conceptual framework or a particular focus, they must be justified, described, and explained in terms of being representative of that conceptual framework or focus. Therefore, topics that are developed to reflect a conceptual framework or focus must be consistent with the original definitions described by that framework. However, because content analysis is often used in exploratory and descriptive research, a conceptual orientation may not be appropriate.

Kathleen Huttlinger

CONTINUING CARE RETIREMENT COMMUNITIES

A continuing care retirement community (CCRC) is a type of facility that provides housing, meals, and other services, including nursing home care, for older adults in exchange for a one-time capital investment or entrance fee and a monthly service fee. Most CCRCs are sponsored by religious or other nonprofit organizations, but for-profit organizations have entered into the retirement business as well. The CCRC is usually constructed as a village or community, and the individual remains within this community for the remainder of his or her life. All CCRCs have a written contract that residents must sign. The terms of the contract vary and have been separated into three categories by the American Association of Homes and Services for the Aged: (1) Type A homes are "all inclusive" as they offer guaranteed nursing care in the nursing facility at no increase in the residents' monthly fee; (2) Type B CCRCs do not guarantee unlimited nursing home care but have a contractual agreement to provide a specific number of days per year or lifetime of the resident in the nursing facility; and (3) Type C CCRCs are based on a typical fee-for-service approach. Financial stability, particularly of Type A and Type B CCRCs, depends on high occupancy rates in the independent living apartments and maintaining residents' in optimal health and function so as to need fewer health care services.

The number of CCRCs continues to grow, and there are more than 725,000 older adults living in more than 2,240 CCRCs. The majority of CCRCs are located in 12 states. Because of the dramatic increase in assisted living facilities, CCRCs proportionally account for a smaller percentage of senior housing than previously. Given the anticipated increase in number of older adults, it is expected that the number and occupancy of these settings will likewise increase.

Generally, older adults who live in CCRCs are those who were never married, or married without children, are well educated, and health conscious (American Association of Homes and Services for the Aged, 2006; Lewis et al., 2006; Zalewski, Smith, Malzahn, VanHart, & O'Connell, 2009). Initially CCRCs were for affluent older adults; however, CCRCs are becoming more affordable and attracting those with more moderate incomes (Anderson, Michelman, Johnson, & Quick, 2008). The decision to move into a CCRC requires a good deal of planning and adjustment for older adults, especially if they are relocating to another city or state and/or moving from a large home to a smaller apartment.

Residents in CCRCs overall use of Medicare-covered medical services is no different from older adults who live in traditional community settings, with the exception of lower expenditures for hospital care (Ruchlin, Morris, & Morris, 1993). The types of health care services provided vary on the basis of the facility. Most facilities have a nurse responsible for those in independent living to help with routine care activities such as dressing changes, administration of injectable medications, and health screenings. It is these nurses who are the first response to emergencies and often the first to identify changes in the older resident. Depending on the CCRC, there may also be a geriatric nurse practitioner available for daytime management of acute and chronic problems and a cadre of primary and specialty physicians. The availability of health care is seen as a major advantage to living in a CCRC, and the focus on health promotion and disease prevention is of importance to residents. The focus on health and the maintenance of health, which is held by the residents in CCRCs and supported by managers within these systems, make the CCRC a perfect environment for geriatric nursing research.

The initial research in CCRCs focused on the assessment of residents before move in (Resnick, Russell, & Ruane, 2003) and their adjustment to the community once the move occurred (Petit, 1994; Resnick, 1989). With the aging of the communities and the residents, the focus of this work has moved toward learning about transitions of care within these settings (e.g., moves from independent living to assisted living or nursing home; Ashcraft, Owen, & Feng, 2006; Shippee, 2009; Young, 2009). Specifically, transitions have been considered with regard to the meaning of those transitions for older adults as well as the risk factors for transitions. Transitions within the CCRC setting are described by residents as disempowering and final and noted to cause a loss of social networks. Factors associated with increased risk of transitions include depression, urinary and bowel incontinence, cognitive impairment, and functional disability. The findings from these studies provide recommendations for how to help prepare residents in CCRCs for transitions from one level of care to another.

The majority of research done in CCRCs, however, is focused on health promotion throughout the aging process (Adams, 1996; Lewis et al., 2006; Petit, 1994; Resnick, 1998, 2003; Resnick & Spellbring, 2000; Resnick, Wagner, & House, 2003). Studies have included descriptive surveys where residents are asked about specific health behaviors such as getting vaccinations, monitoring cholesterol and dietary fat intake, exercise activity, alcohol and nicotine use, and participation in health screenings including mammograms, Pap tests, stools for occult blood or prostate examinations, or osteoporosis management. Findings have indicated that the majority of residents in CCRCs get yearly flu vaccines, have had at least one pneumonia vaccine, and approximately 61% had an up to date tetanus booster. A smaller percentage (approximately 30%) monitored their diets. Approximately 50% of those living in CCRCs drink alcohol regularly, only a small percent use nicotine (11%), and less than 50% exercise regularly.

With regard to cancer screening, approximately 40% to 50% of the residents get yearly mammograms, 31% to 37% get Pap tests, 65% to 80% get Prostate examinations, approximately 60% have stools checked for blood yearly, and a little more than 50% monitor their skin for abnormal growths regularly. Overall, there is better participation in health promoting activities of older adults living in CCRCs when compared with older adults in the community (Lewis et al., 2006; Resnick, 2003). Residents of CCRCs tend to continue to engage in screening activities even when these are not recommended (Lewis et al., 2006).

In addition to a description of the health promotion behaviors of these individuals, consideration has been given to factors that influence the residents' willingness to engage in screening activities. Combined qualitative and quantitative approaches were used to explore this question (Resnick, 1998, 2003; Rosenberg et al., 2009). Common themes were identified by open-ended interviews and indicated that the common reasons for not engaging in specific health activities were as follows: (1) never being told to by a primary health care provider, (2) not wanting to do anything even if the tests were abnormal, (3) feeling they were too old, and (4) a desire to contract the known problem so as to facilitate death.

The impact of the CCRC environment (i.e., access to services and physical environment) on healthy behaviors has also been considered. Increased access to services in "all-inclusive" settings (Young, Inamdar, & Hannan, 2010) increases the opportunities for health promotion. In addition, the physical environment, particularly the many opportunities for walking and other types of physical activity (Resnick & D'Adamo, 2011; Zalewski et al., 2009), is associated with increased function and physical activity regardless of the residents' underlying capability. Conversely, with regard to life prolonging interventions such as availability of automated external defibrillators, as per the wishes of residents, these devices are *not* easily available for use in the facility (Woodley, Medvene, Kellerman, Base, & Mosack, 2006). There is also no overwhelming support of smart home technologies among CCRC residents because of concerns about privacy (Courtney, Demiris, Rantz, & Skubic, 2008). There tends to be a philosophy among residents of optimizing health but avoiding aggressive interventions that will sustain life in the face of illness (Nahm & Resnick, 2001).

Falls, which are a common problem for older adults in any setting, is another area that has been studied in CCRCs. For example, predictors of falls in a CCRC was studied (Resnick, 1999), and findings supported the need to evaluate predictors of falls within each specific community as environmental risks and activity patterns may be very different. In the community studied, falls generally occurred between noon and midnight, within the residents' apartments, and when walking (63%) or transferring (19%). Only 16 (10%) of the falls resulted in a fracture. The number of falls was the only variable associated with having an injurious fall. Individuals who had atrial fibrillation or neurological problems, were not married, and did not adhere to a regular exercise program were more likely to have multiple falls. In addition, it was noted that the falls were less likely to occur in residents who exercised regularly (Crowley, 1996). A CCRC setting was also used to test a Post-Fall Index with the goal of using this tool for secondary prevention of falls in future research (Gray-Miceli, Strumpf, Johnson, Draganescu, & Ratcliffe, 2006).

CCRCs continue to be a viable living environment for older adults. In order for these facilities to keep costs down and remain lucrative, it is imperative that there be a focus on maintaining health and function and in helping individuals remain in the least invasive level of care (i.e., independent living). Continued research needs to build on the preliminary findings from exploratory studies and begin to develop and test interventions that will help older adults in CCRCs maintain their health and function, prevent injuries, address end-of-life care preferences, and optimize use of health care resources. Examples of this include consideration of the increasing number of CCRCs with wellness programs and the outcomes of these programs from a health and fiscal perspective. Other important areas of research within CCRCs need to address smart home technologies and use of technology in general to promote health and safety, for example, use of smart phones to detect a fall among older individuals or medication management technology. Testing of the impact of electronic medical records to optimize transitions within settings and between CCRC settings and acute care facilities should also be the focus of future research. CCRCs have been and will continue to be a wonderful housing alternative for older adults, and consideration needs to be given to how to make these sites affordable for all.

Barbara Resnick

CORONARY ARTERY BYPASS GRAFT SURGERY

Coronary artery bypass graft (CABG) surgery is a commonly used revascularization procedure for coronary heart disease. An estimated 800,000 surgeries are performed worldwide each year (Borowicz et al., 2002), with 448,000 performed in the United States in 2006 (American Heart Association, 2009). In the United States, CABG surgery uses more healthcare resources than any other single procedure and accounted for more than 209.3 billion dollars in health care costs in 2003 (www.rxpgnews.com). In many developed countries, demand for CABG surgery exceeds resources leading to waiting lists. Patients on waiting lists experienced anxiety, depression, and negative impacts on quality of life (Fitzsimons, Parahoo, & Stringer, 2000; Screeche-Powell & Owens, 2003).

Several randomized controlled trials examined the effectiveness of nurse-led programs for patients awaiting CABG surgery. Patients awaiting surgery with at least one poorly controlled risk factor (e.g., high blood pressure, high cholesterol, smoking, etc.) were randomized to standard care or a nursing intervention. Outcome measures included anxiety, depression, blood pressure, cholesterol level, length of stay, body mass index, and costs of hospital expenditures. There were no significant differences between the groups except for total costs of hospital expenditure, with the intervention group having fewer admissions, and therefore lower costs. Depression and anxiety scores did decrease for the intervention group, but the difference between the groups was not statistically significant (Goodman et al., 2008).

For patients undergoing CABG surgery, there are four goals: to increase survival, to relieve symptoms of angina, to reduce the likelihood of future heart attacks, and to improve quality of life (QOL; Dunckley, Ellard, Quin, & Barlow, 2008; Hawkes, Nowak, Bidstrup, & Speare, 2006). Although CABG surgery succeeds in increasing survival and decreasing angina in most patients, it is now recognized that adjustment to CABG surgery is a multidimensional process that is not completely explained by medical factors (Hawkes et al., 2006). Investigators have found that a substantial proportion of patients do not experience an improvement in their QOL, with some patients actually experiencing decrease in QOL after surgery (Hawkes & Mortensen, 2006). In several global studies, researchers examined the course of changes in QOL as well as longitudinal predictors of QOL. Patients undergoing percutaneous coronary interventions experienced a relatively rapid increase in health-related QOL (HRQL) in the first month with little change by 3 months after surgery. However, patients undergoing CABG surgery experienced an initial deterioration in HRQL and then improved significantly. The change in the scores on anxiety and depression accounted for most of the change in HRQL (Hofer, Doering, Rumpold, Oldridge, & Benzer, 2006). In a study evaluating the influence of preoperative physical and psychosocial functioning on QOL after CABG surgery (Panagopoulou, Montgomery, & Benos, 2006), researchers identified that preoperative psychological distress was the only predictor of QOL at one month and six months after surgery.

Longitudinal studies investigating the impact of psychological variables on outcomes of CABG surgery demonstrate that recovery is neither simple nor experienced consistently in all patients.

Although some studies included the measurement of only anxiety or depression, most examined the impact of both anxiety and depression on recovery. In a systematic review of preoperative predictors of postoperative depression and anxiety, McKenzie, Simpson, and Stewart (2010) found that the majority of studies reported an improvement in patient's depression and/or anxiety postoperatively.

The most common predictor of postoperative anxiety was preoperative anxiety. The impact of gender and age was equivocal with some studies identifying age as predictive and an equal number finding it not predictive. One study identified a relationship between age and anxiety (Krannich et al., 2007). Although younger patients were more anxious before surgery and showed a decline in symptoms after surgery, anxiety symptoms in older patients showed little change (Krannich et al., 2007).

As with the findings related to anxiety, the most frequently identified predictor of postoperative depression was preoperative depression. In studies with women, female gender was a frequently reported predictor of postoperative depression, but the impact of age was equivocal. A conclusion from the systematic review was that the most common predictors of postoperative anxiety and depression were preoperative levels. One consistent recommendation was that clinicians needed to routinely assess patients' depression and anxiety before surgery to identify those patients at greater risk for postoperative difficulties. In keeping with these recommendations, screening for depression in patients with coronary heart disease has recently been recommended by the American Heart Association (Lichtman et al., 2008). In addition, with more women and older adults undergoing CABG surgery, the impact of age and gender on postoperative recovery needs to be further explored.

A number of studies have examined the course and outcomes of anxiety for patients undergoing CABG surgery. Longitudinal studies evaluating anxiety reported prevalence rates ranging from 4% to 50% preoperatively and from 25% to 61% postoperatively. Almost all studies used self-report questionnaires for measuring anxiety. Subjects' (*n* = 35 to 1,317) mean ages ranged from 54 to 70 years, most represented a 3:1 male-to-female ratio, and ranged from 82% to 100% Caucasian. Most investigators found that anxiety levels significantly decreased over time and remained linear. Postoperative anxiety was directly related to perception of pain with the strongest relationship on postoperative Day 2. Neither gender nor age was significantly associated with level of pain (Nelson, Zimmerman, Barnason, Nieveen, & Schmaderer, 1998). In a large study with 1,317 patients, there was a dose–response relationship between state anxiety and risk of death or myocardial infarction but no association between self-reported anxiety and atherosclerotic progression of grafts (Wellenius, Mukamal, Kulshreshtha, Asonganyi, & Mittleman, 2008). In one study, patients with chronic postoperative pain had significantly higher levels of anxiety and depression than those without chronic pain (Taillefer et al., 2006). The mechanism by which anxiety increases mortality and morbidity is not yet understood (Rosenbloom, Wellenius, Mukamal, & Mittleman, 2009).

Longitudinal studies evaluating depression reported prevalence rates ranging from 16% to 50% preoperatively and from 17% to 61% postoperatively. Almost all studies used self-report questionnaires. Subjects' (*n* = 50 to 759) mean ages ranged from 54 to 70 years, most represented a 3:1 male-to-female ratio, and ranged from 82% to 100% Caucasian. In addition to preoperative depression levels, investigators have identified predictors of postoperative depression as poor social support, at least one stressful life event in the last year, low level of education, and moderate to severe dyspnea (Pirraglia, Peterson, Williams-Russo, Gorkin, & Charlson, 1999). One study found that 6 weeks after surgery, fatigued older patients (>65 years) had significantly higher anxiety and depressive symptoms with residual aspects of having higher anxiety (experiencing panic and worry) remaining high at 3 months (Barnason et al., 2008). Depression has consistently been associated with adverse cardiac outcomes after CABG surgery. Investigators have found depressive symptoms, pre- or postoperatively predict postoperative cardiac events (unstable angina, myocardial infarction, repeat CABG, or angioplasty), and are positively correlated with the rate of readmission for cardiac events (Perski et al., 1998; Saur et al., 2001; Scheier et al., 1999). Connerney, Shapiro, McLaughlin, Bagiella, and Sloan (2001) determined that patients meeting criteria for major depressive disorder at discharge were significantly more likely to experience a cardiac-related event. Furthermore, depression was a predictor independent of classic cardiovascular risk factors. Both increased preoperative depression and postoperative anxiety were identified as risk factors for cardiac-related hospital admissions within 6 months of surgery (Oxlad, Stubberfield, Stuklis, Edwards, & Wade, 2006). In addition, postoperative depression was associated with infections, impaired wound healing, poor emotional and physical recovery, and a higher risk of atherosclerotic progression among patients with saphenous vein grafts (Doering, Moser, Lemankiewicz, Luper, & Khan, 2005; Wellenius et al., 2008).

Blumenthal et al. (2003) identified higher mortality rates for patients with moderate to severe depression at baseline and mild or moderate to severe depression that persisted from baseline to 6 months. In contrast to the finding of the earlier studies, a more recent study suggested that preoperative depression was not associated with a significantly higher risk for mortality, but after adjustment for known mortality risk factors, preoperative anxiety symptoms were significantly associated with increased all-cause mortality risk. Investigators identified that there was a trend toward significance of depressive symptoms and mortality risk, but the significance may have been attenuated by the use of psychotropic medications (Tully, Baker, & Knight, 2008).

Several studies have addressed gender differences in recovery from CABG surgery. In some studies, women had more symptoms and poorer functioning after CABG than men, whereas in other studies, there were no significant differences (Vaccarino, 2003). Vaccarino, Abramson, Veledar, and Weintraub (2002) found that women undergoing CABG surgery were older, less educated, had more severe and unstable angina, had congestive heart failure, had lower functional status, and had more depressive symptoms in the month before surgery. Younger women were at a higher risk of in-hospital death than men, a difference decreasing with age. In a Canadian study, investigators found that after adjusting for age and comorbid conditions, female gender was associated with a 10% increase in length of stay, a 97% increase in mortality, and a 7% increase in overall cost (Bestawros, Filion, Haider, Pilote, & Eisenberg, 2005). In contrast to the earlier findings, a recent study in Japan found that the clinical outcomes for females after CABG surgery were comparable with those of males (Fukui & Takanashi, 2010).

Postoperative neuropsychological deficits can be complications of cardiac surgery. A group of investigators in China found that patients undergoing surgery with bypass exhibited more neuropsychological deficits and anxiety than those patients whose surgeries were completed off pump. Investigators found that depression and anxiety were correlated with some factors of cognitive dysfunction (Yin, Luo, Guo, Li, & Huang, 2007). In contrast to these results, Stroobant and Vingerhoets (2008) found that off-pump patients showed higher cognitive–affective depression scores than on-pump patients. On-pump patients generally showed no depression, whereas off-pump patients had a mild depression that continued for 3 to 5 years after surgery. In another study, no differences were found between patients undergoing surgery on and off pump. Although significant improvement was identified in state anxiety and depressive symptoms, the number of patients with depressive symptoms remained constant. Unlike other studies, patients in this sample reported significant subjective improvement in concentration and memory (Sandau, Lindquist, Treat-Jacobson, & Savik, 2008). A study examining perceived cognitive function and emotional distress following CABG surgery found that emotional symptoms and perceived cognitive difficulties were significantly related at the same point in time as well as across time periods. Although perceived cognitive difficulties at baseline predicted a more negative course of emotional symptoms, baseline emotional symptoms did not predict the course of cognitive difficulties (Gallo, Malek, Gilbertson, & Moore, 2005).

The benefits of preoperative interventions have been examined in three randomized controlled studies of patients awaiting CABG surgery (Arthur, Daniels, McKelvie, Hirsh, & Rush, 2000; Garbossa, Maldaner, Mortari, Biasi, & Leguisamo, 2009; McHugh et al., 2001). Arthur et al. (2000) found that the treatment group receiving exercise training twice weekly, education, reinforcement, and monthly nurse-initiated phone calls spent less time in the hospital overall and less time in intensive care units. Intervention group patients reported improved QOL both pre- and postoperatively. In the study by McHugh et al. (2001), care provided in patient's homes by nurses led to decreases in cardiovascular disease risk factors as well as levels of anxiety and depression. A study of the effects of physiotherapeutic instruction on anxiety of CABG patients (Garbossa et al., 2009) found that preoperatively patients in the intervention group reported lower levels of anxiety, whereas postoperatively both groups reported decreased levels of anxiety without a significant difference between the groups. Anxiety was higher preoperatively for female patients, and higher postoperative anxiety led to longer lengths of hospital stay.

There is a general agreement that early postoperative intervention should be offered to patients experiencing depression and/or anxiety. A randomized controlled trial examined the timing (before or after discharge) for delivering individualized patient education intervention after CABG surgery (Fredericks, 2009). Although no differences were found between the two time points, the recommendation was made that nurses assess anxiety levels before the delivery of education, implement strategies to reduce high anxiety (highest level is 24 hours before discharge), and provide individualized teaching. Several randomized controlled trials of nursing interventions (two by telephone and one in home) examined anxiety, depression, and QOL in patients following CABG surgery (Hartford, Wong, & Zakaria, 2002; Lie, Arnesen, Sandvik, Hamilton, & Bunch, 2007; Rollman et al., 2009). One of the telephone interventions, which consisted of information and support to assist patients and their partners in meeting their needs, found decreased anxiety in the intervention group 2 days after discharge but no significant differences at Weeks 4 and 8 (Hartford et al., 2002). The second study (Rollman et al., 2009) examined the impact of an 8-month telephone multidisciplinary intervention for treating depression post CABG surgery. The nurse care manager called patients to review their psychiatric history, to provide basic psychoeducation about depression and its effect on cardiac disease, and to describe treatment options. Compared with usual care, patients in the intervention group reported greater improvements in HRQL, physical functioning, and mood symptoms at 8 months of follow-up. In addition, men benefited more than women from the intervention. In a study on the effects of a home-based intervention program on anxiety and depression 6 months after CABG surgery (Lie et al., 2007), investigators found significant improvements in both the intervention and the control groups at 6 weeks and 6 months but no differences between groups. In a randomized controlled pilot of cognitive behavioral therapy with 15 depressed women after surgery, investigators found that cognitive behavioral therapy yielded moderate to large effects for improving depression and immunity and reducing infection and inflammation after surgery

(Doering, Cross, Vredevoe, Martinez-Maza, & Cowan, 2007).

Several studies have explored the effect of relaxation techniques for CABG patients post surgery. Investigators found improvement in emotional well-being, state and trait anxiety, daily activities, several social parameters, and QOL (Dehdari, Heidarnia, Ramezankhani, Sadeghian, & Ghofranipour, 2009; Trzcieniecka-Green & Steptoe, 1996).

Data are also accumulating about the efficacy of selective serotonin reuptake inhibitors (SSRI) on the treatment of depression in patients with cardiovascular disease. In one study (Xiong et al., 2006), SSRI use before CABG was associated with a higher risk of postoperative rehospitalization and long-term mortality. Investigators noted that the explanation for the adverse effects could be due to incompletely treated depression, SSRI use, or another complex mechanism. Another study (Kim et al., 2009) found that the preoperative use of SSRIs did not increase the risk of bleeding or in-hospital mortality.

Evidences that depression and anxiety have prognostic importance in determining CABG surgery outcomes support the development of pre- and postoperative nursing assessment strategies to identify patients at risk for adverse events. Nurses can play pivotal roles in identifying patients who need further evaluation, providing education about the effects of depression and anxiety on CABG surgery outcomes, and developing and evaluating interventions aimed at ameliorating the effects of these risk factors on postoperative morbidity and mortality. The challenge for intervention research is to address anxiety and depression rather than either in isolation and to assess and treat these both pre- and postoperatively. Clearly, there is a need for large, randomized trials of both antidepressants and psychosocial interventions after CABG surgery to determine their efficacy with treatment of anxiety and depression.

Susan H. McCrone

COST ANALYSIS OF NURSING CARE

Cost analysis of nursing care reflects a body of administrative studies that focus on quantifying nursing costs needed to deliver care to individual clients or aggregates in a variety of settings, using a variety of practice models and analysis tools. All cost analysis is based on assumptions that must be examined and made explicit when reporting findings.

Much of the research on cost analysis of nursing care has focused on "costing out" nursing services for the purpose of measuring productivity, comparing costs of various nursing delivery models, charging individual patients for true nursing costs, and relating nursing costs to other cost models, most notably diagnostic-related group categories. The need and the motivation for these costing efforts have evolved with the economic underpinnings of the health care system, as have the methodologies and setting focuses.

Cost analysis of nursing care focuses on justifying the cost-effectiveness of professional practice models, evaluating redesign efforts, and monitoring and controlling nursing costs within an ever-tightening, cost-conscious health care environment. Within the context of rising capitation penetration, cost analysis is essential to accurate capitation bidding and financial viability of the parent organization. As "best practices" benchmarking pushes the envelope of competitive bidding, demonstrating cost-effective nursing practice becomes essential to securing managed care contracts. Cost analysis research is a type of nursing administrative research that evaluates aspects of the delivery of nursing care.

Cost analysis studies have been relevant to decision making by nursing administrators in selecting delivery models, treatment protocols, and justifying budgets, but such studies may become central to the survival of the entire profession for the future. Questions of appropriate skill mix cannot be determined solely on a cost per hour of service, cost per case, or cost per diagnostic-related group basis. New studies are needed that will combine traditional cost analysis with differential outcome analysis to secure a larger picture of the "true cost–benefit ratio" for specific nursing models.

The most notable characteristic of cost analysis studies is the variety of definitions, variables, and measurement tools used in the studies. Length of stay and nursing turnover are major variables included in cost studies. A major area of dispute for costing studies is the lack of a standard acuity measure because of the proprietary nature of most acuity systems. Cost and efficiency of nursing procedures or treatments continue to be studied. Another important area for cost analysis is to evaluate cost differences among professional practice models. However, most of these studies use proprietary practice models that are difficult to duplicate in other settings. Variables are identified in these studies that do impact nursing costs, such as nursing turnover, ratio of productive to nonproductive hours, and nursing satisfaction.

Given the growth of capitation, cost analysis of nursing services will need to take new directions. As critical pathways (benchmark performance tools) evolve as care guides, the costs of pathway changes on nursing delivery, patient outcomes, and case costs must be calculated. What are the most efficient and effective pathways toward resolution of a given health problem? What practice setting is appropriate for patients at each step of the pathway? For example, when is it safe to transfer a fresh open heart patient from critical care to a step-down environment? (Earliest transfer to a least costly delivery mode saves money.) These calculations may be critical for institutions to secure managed-care contracts in a cost-competitive environment. Determining what activities can be safely eliminated from a pathway without negatively impacting care outcomes will have cost and resource savings as we move to "best demonstrated practices."

Finally, we must move toward a cost–benefit analysis model that incorporates the outcomes of practice. This aspect has been especially elusive, given the "generic" and group nature of nursing practice. With multiple nursing providers impacting a patient's care, how do we separate the relative contributions of each person or each subspecialty of nursing practice that a patient may experience in the course of their care from contributions of other disciplines? Additionally, we need to quantify the costs of increased patient mortality and failure to rescue associated with changes in nurse/patient ratios.

Mary L. Fisher

CRITICAL CARE NURSING RESEARCH

In the history of nursing, the development of the specialty of critical care is fairly recent, paralleling the growth and development of intensive care units (ICUs) in the 1960s and 1970s. The first ICUs were areas in the hospital designated for the care of patients recovering from anesthesia who required close monitoring during a period of physiological instability. Recognition of the efficiency and effectiveness gained from segregating any patients who required intensive nursing care for a short period of time was spurred by experiences in managing groups of critically ill patients, such as those injured in the Boston Coconut Grove fire of 1942 and victims of the polio epidemics of the 1950s (Lynaugh & Fairman, 1992). The development of the mechanical ventilator and advances in coronary care led to recognition of the need for specialized skills and knowledge bases among nurses caring for these patients.

The first specialty organization was formed by nurses working in coronary care, originally named the American Association of Cardiovascular Nurses, was formed in 1969 (Lynaugh & Fairman, 1992). As electrocardiographic monitoring became a routine tool in the care of many patients and critical care broadened to include the care of patients other than postanesthesia and those with cardiac disease, the name was changed to the American Association of Critical-Care Nurses (AACN). Today, AACN is the largest specialty nursing organization in the world, with more than 80,000 nurses in the United States and 45 other countries (retrieved August 16, 2010, from http://www.aacn.org). The organization has had a major role in encouraging research through its own small grants program, through joint funding initiatives with corporations. AACN publishes *American Journal of Critical Care*, a scientific research journal, and *Critical Care Nurse*, a clinical journal featuring research. AACN also publishes evidence-based resources for the clinical practitioner, including standards of care, defined as "authoritative statements that describe the level of care or performance common to the profession of nursing by which the quality of nursing practice can be judged" (retrieved August 16, 2010, from http://www.aacn.org/wd/practice/content/standards.pcms?menu=practice).

Other nursing journals publishing critical care research include *Heart and Lung*, *Nursing Research*, and *Biological Research for Nursing*. Nurse researchers have increasingly published in medical research journals, such as C*ritical Care Medicine*, published by the Society of Critical Care Medicine. The International Society of Critical Care Medicine is the largest multiprofessional organization of critical care practitioners.

AACN is committed in its vision and mission to the promotion of a "culture of inquiry" so that optimally no gap exists between research and practice. The research vision encourages critical care nurses to actively question the scientific base for their nursing practice, driven by the needs of patients and their families. Guided by these expectations, the AACN research priorities for the year 2010–2011 are broad yet concrete:

- Effective and appropriate use of technology to achieve optimal patient assessment, management, and/or outcomes
- Creation of healing and humane environments
- Processes and systems that foster the optimal contribution of critical care nurses
- Effective approaches to symptom management
- Prevention and management of complications (AACN, 2010).

Nurse researchers often rely on their specialty organization to highlight future research needs and identify gaps in the literature. Interdisciplinary, systematic reviews of the scientific literature are now considered essential to shine a light on important areas of research that deserve more attention or require greater rigor in methodological design. During the past decade, the nursing discipline has shifted away from the concept of simple research utilization to evidence-based nursing (EBN; Ackley, Ladwig, Swan, & Tucker, 2008). Compared with its precursor, EBN emphasizes the complexity of variables to consider before application to practice; leveling and grading of scientific evidence, patient preference, staffing requirements, cost-effectiveness, clinician's experience, and environmental factors are all considered in a systematic review of the literature and in the decision-making process for application to practice.

The leadership roles and resources within the critical care environment as well as the overall organizational climate of the institution influence the degree to which staff nurses are able to make effective use of research findings for the implementation of EBN (Halm, 2010). In a systematic review of the literature on the effect of leadership on the likelihood of research utilization, Halm (2010) concluded that several factors were critical to the practice of EBN: (1) the transformational leadership behaviors, particularly among nurse executives in Magnet hospitals; (2) the positive impact of the local unit culture; and (3) the quality of the unit leader–nurse interactions with staff nurses. An interesting aspect of successful transformations to EBN is in the redefinition of "real work" from that of a "doing" culture, that is, that values the practical busyness of accomplishing tasks, to that of a "being" culture, that is, reflecting on practice, integrating research into practice.

Collaborative projects in critical care are valued more explicitly, as the contributions from the disciplines of psychology, medicine, gerontology, respiratory care, and social work often overlap with those of nursing. In 2009, the AACN's Evidence-Based Practice Resource Work Group published an updated evidence-leveling system used to grade scientific studies and other sources of information for application to critical care practice (Armola et al., 2009). The intent of this review was to evaluate grading systems adopted by other specialty organizations, to consider the quality of prioritized research design in the leveling process, and to evaluate the inclusion of meta-synthesis as an additional research design. The new system ranks meta-analysis and meta-synthesis as the highest level in the hierarchy of evidence for recommendation. AACN's future priorities for 2010–2011 focus on concerns related to topics essential to excellence in practice, including medication management, hemodynamic monitoring, healing environments, palliative care and end-of-life issues, mechanical ventilation, monitoring neuroscience patients, and noninvasive monitoring of critically ill patients (AACN, 2010).

Increasingly, nursing care interventions in the ICU are *bundled*. A bundle is a structured way of improving the processes of care and patient outcomes. It consists of a set of evidence-based practices, usually three to five interventions that, when performed collectively and reliably, have been proven to improve patient outcomes (Resar et al., 2005). A bundle has the effect of conceptually and behaviorally linking idiosyncratic and seemingly unrelated nursing interventions into a package of interventions that clinicians know must be followed for every patient, every single time. Compared with a checklist, the bundle is based on and determined by Level 1 evidence. Examples include the Central Line Bundle and the Ventilator Bundle (IHI, 2010).

Critical care has been a research-intensive discipline, both in medicine and in nursing. The initial narrow focus on maintaining physiological stability of the cardiopulmonary system undoubtedly contributed to the early commitment to research-based practice. Critical care nurse scientists have been extraordinarily productive, creative, and sophisticated in their investigations. A recent search of grants currently funded in 2010 by the National Institute of Nursing Research yielded 592 federally funded studies of pediatric and adult patients. This author identified 33 studies (6%), which were focused on the critical care patient population (Project Reporter, 2010). The low percentage of funded grants for the critically ill patient population may be underestimated because nurse researchers do apply to other Institutes for funding. Studies were focused on end-of-life decision making for dying and chronically critically ill patients, identification of cellular biomarkers of critical illness and patient outcome, improvement of nursing assessment of patient symptoms and symptom management, relationship among mechanical ventilation, oral care, and infection, and facilitation of communication, learning, and practice improvement in the ICU (Project Reporter, 2010).

Clinical research in intensive care settings presents multiple challenges because of the ethical concerns of obtaining informed consent, the demands of time and availability at the bedside, the need for institutional access to vulnerable subjects, and the overwhelming number of intervening variables that pose threats to the explanatory power of study findings. Such factors include patient-related factors, such as differences in gender, age, previous access to health care, socioeconomic status, presence of comorbidities, variations in mental status, baseline nutritional adequacy, immune function, and unique psychological responses to the illness and the environment, for example, agitation, delirium, and pain. Intervention-related factors are difficult to control for because critically ill patients receive multiple interventions at once, such as diagnostic and surgical procedures, mechanical ventilation, and powerful medications as well as nursing activities related to complications of immobility. The potential for infection, injury, medication errors, sensory deprivation and overload, and effect of noise on quality of sleep are particularly formidable environmental factors that can impact the patient's outcome. Finally, known and unknown variations in patient management by the health care team can alter patient outcomes, and then it is up to the investigator to decide how to handle the problem.

To address some of these concerns, Sole (2010) recommends the following strategies to new investigators: (1) be self-directed, focusing on a clinical question which is important to you, such the effect of positioning; (2) develop an initial study on basic and familiar clinical concepts, such as airway, breathing, and circulation; (3) seek out collaborators and mentors who can support you and become coinvestigators; and (4) plan a simple pilot study within the context of the team, which is "most essential part of the infrastructure" (p. 333). The days of the lone researcher are over. Future research in critical care nursing will continue to require the multidisciplinary efforts of all health care providers who make such a difference in patient outcomes.

Carol Diane Epstein

CULTURAL/TRANSCULTURAL FOCUS

Cultural/transcultural focus is the study of the environment shared by a group seeking meaning for its existence. Nurse investigators pursue this focus to understand the association of culture to health and to provide culturally competent care. Although this focus is growing within research, its impact on patient care has been limited. Culture receives only cursory emphasis in most curricula or practice settings, and few nurses are cultural experts. In light of projections that racial and ethnic minorities will be the majority in the United States by 2030 and the persistence of major health disparities between Euro-Americans and others, more and better nursing research on culture is needed.

Different perspectives on the meaning of cultural/transcultural research (C/TCR) exist. To some, the terms are essentially synonymous, and questions of disciplinary origin are unimportant. Researchers in the Leininger tradition regard transcultural nursing as the proper term for a formal, worldwide area of study and practice about culture and caring within nursing.

C/TCR is found in a great variety of research and clinical journals. Some C/TCR studies (particularly interventions and randomized controlled trials) may be found in the Cochrane database for evidence-based practice using a keyword search on the basis of such terms as the disease name, nurs* and care, nurs* and intervention, and names of racial or cultural groups. Searchers are cautioned that (a) the names of racial or ethnic groups are often used only descriptive labels, and findings do not advance true cultural knowledge; (b) race, culture, and ethnicity lack consensual definitions and are often used interchangeably; (c) acceptable names for groups change over time (e.g., Negro, Black, Afro-American, African American); (d) the name of the highest stage of cultural knowledge changes over time, with cultural competence or cultural proficiency being currently preferred; (e) databases on special populations are often nonexistent or inadequate; (f) although reports specify a focus on a cultural group, discussion may not relate findings to that group; and (g) findings ascribed to culture are often not distinguished from the effects of socioeconomic status, history, or political structures.

Most quantitative C/TCR is theory based. Frequently used frameworks include Leininger's culture care theory, self-care, health-seeking behavior, health belief models, stress and coping, self-efficacy, and transitions. The transtheoretical model of behavior change is becoming popular. Reports are now appearing on the cultural appropriateness of existing frameworks for particular groups. For example, health belief models have been criticized for inadequately recognizing real (rather than perceived) barriers to care, spirituality, and the interconnectedness (rather than the individuality) of African American women. Studies seeking explanatory models of illness are increasing, a welcome trend because this approach, which parallels an intake history and involves all aspects of the disease course and clinical encounter, seems relevant and practical to clinicians as well as researchers. Although most data collection strategies, including physiological measurements, are used in C/TCR, the most frequently used are focus groups, interviews, ethnographies, participant observation, and written questionnaires. Qualitative approaches have long been recognized as well suited to C/TCR and are frequently used.

The overwhelming majority of C/TCR has been intracultural, descriptive, small scale, and nonprogrammatic. The typical study is an interview or survey on health knowledge, health beliefs, and practices or a concept-like self-efficacy within one designated group conducted by a single investigator. However, cross-national nursing studies, studies with large sample sizes, studies done by interdisciplinary or international teams, and programmatic research are becoming more frequent.

Methodological research, including studies of recruiting and retaining subjects and instrumentation, is growing rapidly. The quality of measurement in C/TCR is improving steadily. The standards for rigorous translation are widely recognized, and both the cultural fit of items and the psychometric properties of an instrument for the target group are increasingly being reported and studied. Instruments such as the Cultural Self-Efficacy Scale and the Cultural Awareness Scale are being developed to measure the outcomes of programs to promote multicultural awareness.

There are three major needs in C/TCR. First is the need for more intervention studies (Douglas, 2000). Recent estimates of the proportion of interventions in the C/TCR literature range from 3.6% to 14%. More investigators must move from descriptive studies to interventions to randomized controlled trials. The sheer volume of very similar studies of the health beliefs, family values, sex roles, and importance of family decision making, folk remedies, or spirituality within certain groups suggests a sufficient base for intervention studies. A second great need is for application of existing guidelines for culturally competent research. Research needs to be planned to be culturally competent. Culturally competent research is broader than efforts to select culturally appropriate instruments or to recruit appropriate subjects. Application of these guidelines should mesh nicely with the third great need of C/TCR, which is for research to be planned and conducted with greater community involvement. More studies, particularly programmatic studies, are needed of Native American health. Studies of multiracial or multiethnic persons are rare but urgently needed, given the growing numbers of people who identify themselves as having multiple heritages. Studies of rural, occupational, and sexual subcultures (groups not defined by race or ethnicity) are needed, as are comparative explorations of cultural perspectives on ethics. Folk and alternative healing practices and their possible combinations with biomedical approaches need systematic, sensitive study. Studies of cultural adaptations of care in homes, development of brief rapid strategies for cultural assessment, and development of the economic case for culturally competent care are needed to insure that culture is considered in this era of managed care, case management, and ever briefer inpatient stays.

Sharol F. Jacobson

CURRENT PROCEDURAL TERMINOLOGY–CODED SERVICES

Current Procedural Terminology (CPT)–coded services include more than 8,000 services listed in the Physicians' Current Procedural Terminology manual published annually by the American Medical Association (AMA). Developed by the AMA in 1966, the CPT coding system, which mainly describes physician procedures, is intended to provide a uniform language that accurately describes medical, surgical, and diagnostic services (AMA, 2007). The CPT serves as a method for payment by public (Medicare and Medicaid) and private (commercial insurers) payers. It is also used by policy makers in their deliberations on reforming the payment system. CPT is revised annually to reflect changes in medical practice and technology. Reimbursement to a service represented by individual CPT codes is based on the Resource-Based Relative Value Scale, which was originally implemented to establish a Medicare fee schedule for Part B physician payment. This system now extends to payment for services provided by advanced practice nurses (APNs) and other Part B providers (Robinson, 2009; Robinson, Griffith, & Sullivan-Marx, 2001).

The Physician Payment Review Commission was created in 1986 to advise the Congress on reforms of the methods used to pay physicians under the Medicare Part B program, a program that includes the payment regulations for health care professionals who are eligible to receive direct reimbursement through the Medicare program. Carol Lockhart, PhD, RN, FAAN, the first nurse to serve on the Commission, expressed concern about the lack of nursing data available that would reveal how many services are delivered by a nurse but billed under the physician's name (Griffith & Fonteyn, 1989).

In an attempt to identify whether CPT codes might explain nursing work and thereby provide the needed data, studies were conducted to look at how many billable CPT activities were performed by nurses (Griffith & Robinson, 1993; Griffith, Thomas, & Griffith, 1991; Robinson & Griffith, 1997). Initially, Griffith and Fonteyn (1989) published a questionnaire, in the *American Journal of Nursing*, addressing the performance of CPT-coded procedures by registered nurses; 4,869 nurses returned the questionnaire and 150 made telephone calls or wrote letters. The average number of coded services performed by the respondents was 27, with a range of 0 to 60 (Griffith et al., 1991). There are currently approximately 8,000 published codes in the manual, but at the time of the survey in 1989, only 107 codes comprised 56.9% of all Medicare procedures (Health Care Financing Administration and Bureau of Data Management and Strategy, 1990). Survey results revealed that associate and baccalaureate degree nurses performed significantly more coded services than nurses with diplomas and masters degrees. Overall, the nurses reported very little physician supervision when performing the coded services. As one would anticipate, nurses working in hospital settings performed more services (Griffith et al., 1991).

Building on the *American Journal of Nursing* exploratory study survey, which described activities of generalist nurses, surveys were conducted to estimate the degree to which nurses in nine specialties were performing CPT-coded services. Results revealed that 493 of approximately 7,000 CPT codes were performed by school nurses, enterostomal nurses, family nurse practitioners (NPs), critical care nurses, oncology nurses, rehabilitation nurses, orthopedic nurses, nephrology nurses, and midwives (Griffith & Robinson, 1992, 1993; Robinson & Griffith, 1997). The number of CPT codes performed by specialty nurses ranged from 233 for family NPs to 58 for school nurses. The mean number of coded services performed by individual respondents ranged from 79 for family NPs to 18 for school nurses; individual respondents performed 0 to 162 codes. Supervision by physicians for these groups of nurses was infrequent. Charges to Medicare in 1988 for the coded services included in the survey were $22,793,427.34 (aggregate allowable charges).

The Department of Veterans Affairs (VA) Nursing Workload Capture Task Force, in an attempt to identify and inventory current mechanisms and/or methods of capturing APN inpatient and outpatient VA workload, surveyed APNs practicing in VA facilities across the country (Robinson, Layer, Domine, Martone, & Johnston, 2000). Participants reported that their workload was being captured primarily by using encounter forms, CPT/ICD-9 codes, and productivity reports; only a minimum of inpatient workload was being captured. Sullivan-Marx, Happ, Bradley, and Maislin (2000), in another survey of NPs' use of the CPT billing codes, found that NPs performed services not identified in CPT codes that addressed comprehensive patient care, attention to social factors, and capturing the teaching moment.

A longstanding criticism of the CPT codes is their limitation to describe only physician services and not the full range of health services provided by the entire team. There are CPT codes that describe preventive services and counseling; however, they do not specifically describe nursing practice and are not generally reimbursed by payers. In a study comparing the frequency with which nursing activity terms could be categorized using Nursing Interventions Classification (NIC) and CPT codes, findings revealed evidence that NIC was superior to CPT for categorizing those activities in a study population of AIDS patients hospitalized for *Pneumocystis carinii pneumonia*. Nursing activity terms were categorized into 80 NIC interventions across 22 classes and into 15 CPT codes. These findings supported the importance of nursing-specific classifications for categorization of health care interventions in an effort to demonstrate nursing's contributions to quality and cost outcomes (Henry, Holzemer, Randell, Hsieh, & Miller, 1997). However, Sullivan-Marx and Mullinix (1999) believed that a better option would be to introduce nursing services into CPT if they are not otherwise described in another CPT code. In fact, since 1993, the American Nurses Association has had a representative on the Health Care Professional Advisory Committee to the CPT Editorial Panel and has been directly involved in the process of CPT code development and revision (Sullivan-Marx & Keepnews, 2003).

The Balanced Budget Act of 1997 (Public Law No. 105–33), which became effective January 1, 1998, amended the Social Security Act to grant direct Medicare reimbursement to NPs and clinical nurse specialists in all geographic areas and health care settings at 85% of the physician rate. This enactment precipitated a study by Sullivan-Marx and Maislin (2000) to ensure that there were no significant differences in how NPs and physicians assessed work values for commonly used primary codes. The researchers compared relative work values between NPs and family physicians for commonly used office visit codes and found no significant difference between the two groups for establishing relative work values, therefore providing an indication that services provided by NPs could be reliably valued in the Medicare fee schedule.

To establish relative values for the practice expense component of CPT codes, the Center for Medicare and Medicaid Services, formerly the Health Care Financing Administration, developed and now relies on recommendations from AMA's Relative Value Practice Expense Advisory Committee (PEAC). Specialty societies that serve on PEAC survey their members to obtain accurate "direct input" data for the CPT codes, and then society representatives present the data to the PEAC. The PEAC members critique these data, making modifications as needed. After PEAC approval, data are forwarded to the Center for Medicare and Medicaid Services to use to calculate the practice expense values (AMA, 2010). The ANA has a voting seat on this committee and the nurse representative served as chair of the PEAC in 2006 (Sullivan-Marx, 2008). In addition, in 2010, a nurse was appointed to the prestigious federal policy commission, the Medicare Payment Advisory Commission (MedPAC). The Congress established MedPAC in 1997 to analyze access to care, cost, and quality of care and other key issues affecting Medicare. MedPAC advises the Congress on payments to health plans participating in the Medicare.

McGivern, Sullivan-Marx, and Fairman (2010) reported that organized nursing's political profile is as high as it has ever been. Although the profession has made significant strives in terms of reimbursement during the past decades, there is considerable need for future research and policy developments.

Karen R. Robinson
Hurdis M. Griffith

D

Data Analysis

Data analysis is a systematic method of examining data gathered for a research investigation to support interpretations and conclusions about the data and inferences about the population. Although applicable to both qualitative and quantitative research, data analysis is more often associated with quantitative research. Quantitative data analysis involves the application of logic and reasoning through the use of statistics, an applied branch of mathematics, to numeric data. Qualitative data analysis involves the application of logic and reasoning, a branch of philosophy, to nonnumeric data. Both require careful execution and are intended to give meaning to data by organizing disparate pieces of information into understandable and useful aggregates, statements, or hypotheses.

Statistical data analysis is based on probability theory and involves using specific statistical tests or measures of association between two or more variables. Each of these tests or statistics (e.g., t, F, β, χ^2, ϕ, η, etc.) has a known distribution that allows calculation of probability levels for different values of the statistic under different assumptions—that is, the test (or null) hypothesis and the sample size or degrees of freedom.

Specific tests are selected because they provide the most meaningful representation of the data in response to specific research questions or hypotheses posed. The selection of specific tests, however, is restricted to those for which the available data meet certain required assumptions of the tests. For example, some tests are appropriate for (and assume) nominal or categorical data, others assume ordinal data, and still others assume an interval level of measurement. Although each test has its own set of mathematical assumptions about the data, all statistical tests assume random sampling.

Several statistical computer programs (e.g., SPSS, SAS) are available to aid the investigator with the tedious and complex mathematical operations necessary to calculate these test statistics and their sampling distributions. These programs, however, only serve to expedite calculations and ensure accuracy. There is a hidden danger in the ease with which one may execute these computer programs, and the investigator must understand the computer programs to use them appropriately. To ensure that data analysis is valid and appropriate for the specific research question or hypothesis, the investigator also must fully understand the statistical procedures themselves and the underlying assumptions of these tests.

Most quantitative data analysis uses a null hypothesis statistical test approach. The logic of null hypothesis statistical testing is one of modus tollens, denying the antecedent by denying the consequent. That is, if the null hypothesis is correct, our nonzero findings cannot occur, but because our findings did occur, the null hypothesis must be false. Cohen (1994) and others, however, have argued convincingly that by making this reasoning probabilistic for null hypothesis statistical testing, we invalidate the original syllogism. Despite decades of articles by scientists from different disciplines questioning the usefulness and triviality of null hypothesis statistical testing (for examples from sociology, psychology, public health, and nursing, see Labovitz, 1970; LeFort, 1993;

Loftus, 1993; Rozeboom, 1960; Walker, 1986), null hypothesis statistical testing still dominates analytic approaches.

Some of the articles and arguments about the limits of null hypothesis statistical testing have led to more emphasis on the use of confidence intervals. Confidence intervals provide more information about our findings, particularly about the precision of population estimates from our sample data, but they are based on the same null hypothesis statistical testing logic that generates p values. Thus, confidence intervals are subject to the same issues with respect to Type 1 errors (rejecting the null when it is true) and Type 2 errors (failing to reject the null when it is false).

Increased attention and sensitivity to factors that contribute to findings of statistical significance has also led to more attention to power, sample sizes, and role of effect sizes (for substantive significance) for valid quantitative data analysis. If the sample size is too small, the study may be underpowered and unable to detect an important finding even if it is there. Conversely, if the sample size is too large, the study may be overpowered and may result in statistically significant findings that are substantively or clinically insignificant. Either could be challenged on ethical grounds, stressing the importance of appropriately powering studies for the planned data analysis.

In contrast to quantitative data analysis which requires that the investigator assign a numeric code to all data before beginning the analyses, qualitative data analysis consists of coding words, objects, and/or events into meaningful categories and/or themes as part of the actual data analyses. Because qualitative data analysis involves nonnumeric data, there are no statistical probabilistic tests to apply to the coding of qualitative data.

Coding of qualitative data historically has been done manually, but computer programs (e.g., QSR) are now available to aid the investigator in this laborious effort. However, as with the computer programs for quantitative analyses, computer programs for qualitative data analysis are merely aids for the tedious and error prone tasks of analysis. Using them still requires the investigator to make the relevant and substantive decisions and interpretations about codes, categories, and themes.

Although quantitative data analysis allows for statistical probabilistic statements to support the investigator's interpretations and conclusions, qualitative data analysis depends more exclusively on the strength and logic of the investigator's arguments. Nonetheless, both types of data analysis ultimately rest on the strength of the original study design and the ability of the investigator to appropriately and accurately execute the analytic method selected.

Lauren S. Aaronson

DATA COLLECTION METHODS

In research, data are the pieces of information that are gathered in an effort to address a research question. Data collection typically is one of the most challenging and costly steps in the research process. Researchers make a number of decisions in designing a data collection plan, and these decisions can have a profound effect on the quality of evidence that a study yields. Nurse researchers use a wide variety of methods for collecting data, and these methods vary on a number of important dimensions.

A fundamental dimension involves whether the data being collected are quantitative or qualitative in nature. Quantitative data yield information about a research variable in numeric form, ranging from simple binary values (e.g., 1 = *yes*, 2 = *no*) to more complex numeric expressions (e.g., values for the body mass index). To collect quantitative data, researchers use structured methods and formal instruments in which the same information is gathered from study participants in a comparable, prespecified way. Researchers collecting quantitative data typically spend a considerable amount of preparatory time selecting or developing instruments and then pretesting them to ensure they are appropriate for study participants and will yield high-quality data. Key issues of concern are whether the instruments are *reliable* (yield data that are accurate measures of the concepts of interest) and *valid* (yield data that are truly capturing the focal concepts and not something else). Quantitative data are integrated and analyzed using statistical methods.

Qualitative data are in narrative form, that is, in the form of words rather than numbers. Researchers collecting qualitative data tend to have a flexible, unstructured approach. They often rely on ongoing insights during data collection to guide the course of further data collection rather than having a formal instrument or even a fixed upfront plan about the data to be gathered. Qualitative data tend to be rich and complex and are more difficult to analyze than quantitative data. Key issues of concern in collecting qualitative data are that the data are credible (generate confidence in their truth value), dependable (stable and reliable), and authentic (communicate the mood, experience, language, and context of the participants).

Another important dimension of data collection methods concerns the basic mode. The modes of data collection most frequently used by nurse researchers are self-reports, observations, and biophysiological measures.

Self-reports involve the collection of data through direct questioning of people about their opinions, characteristics, and experiences. Self-reports can be gathered orally by having interviewers ask study participants a series of questions or in writing by having participants complete a written task. Structured, quantitative self-report data are collected using a formal instrument that specifies exactly what questions are to be asked and, often, the response options from which respondents must choose. The instrument is an *interview schedule* when the data are collected orally and a *questionnaire* when the data are collected in writing. Interviews can be conducted either in person, over the telephone, or through various electronic means, such as by videoconferencing or an Internet link (e.g., Skype). Questionnaires can be mailed, distributed in clinical or other settings, or sent over the Internet. Interviews and questionnaires often incorporate one or more formal scales to measure certain clinical data (e.g., fatigue) or a psychological attribute (e.g., self-efficacy, quality of life). A scale typically yields a composite measure of responses to multiple questions and is designed to assign a numeric score to respondents to place them on a continuum with respect to the attribute being measured.

Self-report methods are also used by researchers who seek in-depth qualitative data. When self-report data are gathered in an unstructured way, the researcher typically does not have a specific set of questions that must be asked in a specific order or worded in a given way. Instead, the researcher starts with some general questions and allows respondents to tell their stories in a natural, conversational fashion. Methods of collecting qualitative self-report data include completely unstructured interviews (conversational discussions on a topic), focused interviews (conversations guided by a broad topic guide), focus group interviews (discussions with small groups), life histories (narrative, chronological self-disclosures about an aspect of the respondent's life experiences), and critical incidents (discussions about an event or behavior that is critical to some outcome of interest). Although most unstructured self-reports are gathered orally, a researcher can also ask respondents to write a narrative response to broad open-ended questions or to maintain a written diary of their thoughts on a given topic. Such data can be collected in person, by mail, or by e-mail.

Self-report methods are indispensable as a means of collecting data on human beings, but they are susceptible to errors of reporting, including a variety of response biases. These methods are also not appropriate with certain populations (e.g., young children) or on topics about which participants themselves cannot be expected to bear witness (e.g., their level of agitation or confusion).

The second major mode of data collection is through observation. Observational methods are techniques for collecting data through the direct observation of people's behavior, communications, characteristics, and activities. Such observations can be made by observers either directly through their senses or with the aid of observational equipment such as videotape cameras.

Structured observational methods dictate what specific things the observer should observe, and how to record the observations. In this approach, observers often use checklists to record the appearance, frequency, or duration of preselected behaviors, events, or characteristics. They may also use rating scales to measure dimensions such as the intensity of observed behavior. In structured observation, observers must be carefully trained to identify categories of behavior or actions, and the accuracy of their judgments needs to be assessed using interobserver reliability checks.

Researchers who collect qualitative observational data do so with a minimum of researcher-imposed structure and interference with those being observed. People are observed, typically in social settings, engaging in naturalistic behavior. Researchers make detailed narrative notes about their observations. A special type of unstructured observation is referred to as *participant observation*: the researcher gains entry into the social group of interest and participates to varying degrees in its functioning while gathering the observational data.

Observational techniques are an important alternative to self-report techniques, especially for certain populations (e.g., patients with dementia), certain types of behavior (e.g., patients' sleep–wake behavior), or evolving processes (nurse–patient interactions). However, judgmental errors and other biases can undermine the quality of observational data.

Data for nursing studies may also be derived from biophysiological measures, which include both in vivo measurements (those performed within or on living organisms) and in vitro measurements (those performed outside the organism's body, such as blood tests). Biophysiological measures are quantitative indicators of clinically relevant attributes that require specialized technical instruments and equipment. Qualitative clinical data—for example, descriptions of skin pallor—are gathered not through technical instruments but rather through observations or self-reports. Biophysiological measures have the advantage of being objective, accurate, and precise and are typically not subject to many biases.

Although most nursing research involves the collection of new data through self-report, observation, or biophysiological instrumentation, some research involves the analysis of preexisting data. Clinical records (e.g., hospital records, nursing charts) can be important data sources. A variety of other types of documents (e.g., letters, newspaper articles) and artifacts (e.g., photographs) also can be used as data sources, particularly for qualitative researchers (e.g., ethnographers, historical researchers). When a data set—either qualitative or quantitative—is created by a researcher for a study, it may provide a rich and inexpensive source of *secondary data* for further analysis by other researchers.

In developing their data collection plans, nurse researchers are increasingly triangulating data of various types in creative and productive ways. Triangulation has long been an important tool for qualitative researchers as a means of enhancing the trustworthiness of their data. In particular, ethnographers and grounded theory researchers frequently combine self-report data from interviews with observational data collected in naturalistic settings to achieve a more complete and holistic perspective on the phenomena in which they are interested. In quantitative research, especially in testing the effects of clinical interventions, nurse researchers often triangulate biophysiological and self-report data.

For the past two decades, momentum has been gaining for *mixed-method research*, which involves the triangulation of qualitative and quantitative data in a single study or a coordinated set of studies. Mixed-method researchers often endorse a pragmatist stance in which the research question drives the methods of data collection rather than the methods driving the question. It seems likely that nurse researchers will continue to expand their repertoire of data collection methods, their use of supportive technological tools, and their blending of different types of data as a means of strengthening evidence to guide their practice.

Denise F. Polit

DATA MANAGEMENT

Data management is generally defined as the procedures taken to ensure the accuracy of data, from data entry through data transformations. Although often a tedious and time-consuming process, data management is absolutely essential for good science.

The first step is data entry. Although this may occur in a variety of ways, from being scanned in to being entered manually, the crucial point is that the accuracy of the data be assessed before any manipulations are performed or statistics produced. Frequency distributions and descriptive statistics are generated. Then each variable is inspected, as appropriate, for out-of-range values, outliers, equality of groups, skewness, and missing data. Decisions must be made about dealing with each of these. Incorrect values must be replaced with correct values or assigned to the missing values category. Outliers must be investigated and dealt with. If a categorical variable is supposed to have four categories but only three have adequate numbers of subjects, one must decide about eliminating the fourth category or combining it with one of the others. If continuous variable are skewed, data transformations may be attempted or nonparametric statistics used.

Once each variable has been inspected and corrected where necessary, new variables may be created. This might include the development of total scores for a group of items, subscores, and so forth. Each of these new variables also must be checked for outliers, skewness, and out-of-range values. The creation of some new variables may involve the use of sophisticated techniques such as factor and reliability analyses.

Before each statistical test, the assumptions underlying the test must be checked. If violated, alternative approaches must be sought. Careful attention to data management must underlie data analysis. It ensures the validity of the data and the appropriateness of the analyses.

Barbara Munro

DATA STEWARDSHIP

Data stewardship refers to the responsibility and the accountability to manage uses of data that include but are not limited to data collection, viewing, storage, exchange, aggregation, and analysis. Health data stewardship is a responsibility, guided by principles and practices, to ensure the knowledgeable and appropriate use and reuse of data derived from an individual's personal health information. Health data stewardship has become increasingly important because of the increased use and value of electronic health data and information technology as well as the increased awareness of potential risks associated with incorrect or inappropriate uses of health data. Data stewardship is the responsibility of everyone who uses or interacts with health data, identified or de-identified, for any purpose including, but not limited to, health care, research, quality assessment, population monitoring, policy, and payment.

The National Committee on Vital and Health Statistics has worked with other organizations and agencies to develop key principles and practices of health data stewardship to protect the rights and privacy of persons whose data are involved and to assure the quality and integrity of data. These practices and principles can be grouped into four categories. Principles about *individual rights* address access to one's health data and the opportunity to make corrections, transparency about use, and participation and consent for use. Principles that address *responsibilities of the health data steward* include identification of the purpose for data use; de-identification (when relevant); data quality, including integrity, accuracy, timeliness, and completeness; limits on use, disclosure, and retention; and oversight on uses. Principles and practices for *security safeguards and controls* require the implementation of administrative, technical, and physical safeguards to protect information and to minimize risks of unauthorized or inappropriate access, use, or disclosure. And finally, principles of *accountability, enforcement, and remedies* address requirements for policies that specify appropriate use, implementation of mechanisms to detect noncompliance and enforce consequences, and remediation for individuals whose data are involved. Although these principles have been established, the work of translating them into practice will continue to evolve as the urgency for data stewardship grows even greater (Kanaan & Carr, 2009).

Data and information are the symbolic representation of the phenomena with which nursing is concerned. Data are defined as discrete entities that are objective; information is defined as data that are structured and organized and that have meaning or interpretation. Information that has been synthesized so as to identify and formalize interrelationships is referred to as knowledge. When one term represents all three types of content, it is usually *information*. Nursing data issues revolve around several factors. The first relates to identification of the universe of relevant nursing data. Currently, there is no consensus regarding what data elements make up a minimum nursing data set nor what data elements are required to capture nursing diagnoses, interventions, and outcomes. Systems to label or name these elements are also inconsistently defined. Next, the complex nature of nursing phenomena poses measurement difficulties. Measurement is the process of assigning numbers to objects to represent the kind or amount of a character possessed by those objects. It includes qualitative means (assigning objects to categories that are mutually exclusive and exhaustive) and quantitative measures (assigning objects to categories that represent the amount of a characteristic possessed).

Unlike other biological sciences, few nursing phenomena can be measured by using physical instruments with signal processing or monitoring. Measurement difficulties occur because nursing consists of a multiplicity of complex variables that occur in diverse settings. If one is able to identify what significant variables should be measured, then one is challenged with the difficulty of isolating those variables to measure them. Ambiguities and abstract notions must be reduced to develop concrete behavioral indicators if measurement is to be meaningful. Measuring nursing phenomena also requires the acknowledgment of the "fuzzy" and complex nature of nursing phenomena and the richness of the meaning contained in the context of the data. Finally, the value and use of data that are not coded or numeric, such as whole text data, must be studied to understand their benefits and boundaries for representing nursing phenomena. Content analysis of nursing data and their usefulness have to be further explored.

Processing data implies the transfer of data in raw form to a structured, interpreted information form. Information has characteristics of accuracy, timeliness, utility, relevance, quality, and consistency. Data stewardship suggests that attention be paid to these characteristics. For example, accuracy is of concern at the level of judgment in collecting data as well as at the level of the data collected. Quality of data and information is related to the ability and willingness of clients to disclose information as well as to the nurse's ability to observe, to collect, and to record it. Reliability refers to random measurement errors such as ambiguities in data interpretation. These measurement errors that affect clinically generated data can occur at the point of care delivery, the time of documentation, and when data are retrieved or abstracted for studies (Hays, Norris, Martin, & Androwich, 1994).

With the advent of automated data processing and computerized information systems, decisions about data content, control, and cost need careful consideration. The content and design decisions concern format, standardized languages, level of detail, data entry and retrieval messages, and interfaces with nonclinical data systems. A primary concern of clinicians is the amount of time invested in harvesting data and recording it. Minimum time investment, with maximum clarity and comprehensiveness of data collected and recorded, is needed. Redundancy must be eliminated. Decisions related to content of data demand stewardship to ensure privacy, confidentiality, and security, especially when data are in electronic form. Requirements for legitimate access to data must be managed to facilitate the flow of clinical data while simultaneously restricting inappropriate access. There is a cost associated with the use and development of automated databases; however, accuracy, reliability, and comprehensiveness of information should not be sacrificed because of cost.

Data stewardship poses challenges and responsibilities for nurses in building knowledge bases. Standardization of terms of data is critical, and coordination and synthesis of current efforts are needed. Further study to focus on the following areas has been recommended and continues to be needed: (a) the definition and description of the data and information required for patent care, (b) the use of data and knowledge to deliver and manage patient care, and (c) how one acquires and delivers knowledge from and for patient care (National Center for Nursing Research, 1993).

Carol A. Romano

DELIRIUM

Delirium is an acute, fluctuating disturbance of attention with disorganized thinking and altered psychomotor activity (Meagher, MacLullich, & Laurila, 2008). It frequently accompanies acute physical illness and is found in all care settings and all ages. Estimates of the incidence of delirium range from 11% to 42% for all hospitalized adults and 10% of hospitalized children referred to psychiatry, up to 66% of pediatric intensive care patients referred to psychiatry, 46% for older adults receiving home health care services, and 14% to 39% for residents in long-term care settings. In a community-based adult sample, delirium was found to be superimposed on dementia in 13% of the cases (Fick, Kolanowski, Waller, & Inouye, 2005; Heatherill & Flisher, 2010).

Previously, delirium was thought to be self-limiting and benign. Recent discoveries indicate that delirium is associated with cognitive and functional impairments in adults and children persisting for weeks to months after the index incident of delirium. Moreover, delirium portends poorer outcomes, greater costs of care, and greater chances for death. Despite these profound negative consequences for patients, families, health care providers, and society, delirium remains understudied, especially in children and adolescents.

Delirium is frequently underrecognized and misdiagnosed, although more health care providers than that in the past report screening for delirium (Heatherill & Flisher, 2010; Kuehn, 2010; Patel, 2009). Recognition of delirium continues to be problematic in elderly patients with an underlying dementia or those with the hypoactive-hypoalert variant of delirium. Explanations for the underrecognition and misdiagnosis of delirium include the fluctuating nature of delirium; the variable presentation of delirium; the similarity among and frequent co-occurrence of delirium, dementia, and depression; and the failure of providers to use standardized methods of detection.

Improving the recognition of delirium requires a complex and dynamic solution. Knowledge of delirium and skill in its detection are necessary starting points for improving the recognition of delirium. However, knowledge and skill alone are insufficient, given the profound impediment to the recognition of delirium posed by negative ageist stereotypes. These conclusions are supported by the work of McCarthy (2003) and Neville (2008), which also highlight the powerful influence of the practice environment on how providers think about and respond to delirium.

Several instruments have been developed to screen for or diagnose delirium. Such instruments include Inouye's Confusion Assessment Method, Vermeersch's Clinical Assessment of Confusion—Form A, Albert's Delirium Symptom Interview, Trzepacz's Delirium Rating Scale, Neelon and Champagne's NEECHAM Confusion Scale, O'Keefe's Delirium Assessment Scale, Hart's Cognitive Test for Delirium, Robertson's Confusional State Evaluation, Otter's Delirium Detection Score, McCusker's Delirium Index, Bettin's Delirium Severity Scale, and Breitbart's Memorial Delirium Assessment Scale (Maldanado, 2008). Each has its advantages and disadvantages; the selection of which instrument to use depends in part on the purpose and patient population. The most frequently used instrument in research and clinical practice with adults is Inouye's Confusion Assessment Method and in children and adolescents, Trzepacz's Delirium Rating Scale. The *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision* diagnostic criteria for delirium remains as the gold standard in comparing all instruments. Research supports the use of brief, standardized bedside screening measures as timely, effective, and inexpensive methods for assessing cognitive status and diagnosing delirium. Current standards for surveillance of delirium are to screen for the presence of delirium on admission to the hospital and at a minimum daily. Others recommend brief screening every shift as an element of the standard nursing assessment. Additionally, when there is evidence of new inattention, unusual or inappropriate behavior or speech, or noticeable changes in the way the patient thinks, it is recommended that the assessment be repeated.

The only other testing reported is the use of the electroencephalogram to confirm the presence of delirium in any age group. However, the electroencephalogram has been only modestly diagnostic and is not practical in all situations. Pharmacological and nonpharmacological strategies to prevent and/or treat delirium in patients of various ages and in settings have resulted in only modest benefits, in particular with children and adolescents (Heatherill & Flisher, 2010). The prevailing principles guiding prevention and treatment consist of multifactorial interventions that (a) identify patients at risk, (b) target strategies to minimize or eliminate the occurrence of precipitating factors as primary prevention accomplished through risk reduction, and (c) identify, correct, or eliminate the underlying cause(s) while providing symptomatic and supportive care.

For adults, proactive geriatric consultations and multicomponent interventions targeting several risk factors, rather than targeting a single risk factor for delirium, and interventions with surgical versus medical patients have proved more successful in reducing the incidence, severity, or duration of delirium. However, interventions have had no effect on the recurrence of delirium or on outcomes 6 months after discharge from the hospital.

To better understand why these interventions for adults have not been more successful, some investigators have conducted post hoc analyses to identify the characteristics of patients for whom these interventions have failed. These analyses have indicated that these interventions were less successful with patients who are at greatest risk for delirium: those who are demented, functionally impaired, and frailer. However, it is difficult to determine how to improve these interventions because these studies have been conceptually confused: Efficacy has been confused with effectiveness, changing provider behavior has been confused with preventing or treating underlying causal agents for delirium, and primary prevention has been confused with secondary prevention. Moreover, interventions have targeted risk factors rather than the underlying pathologic mechanisms (i.e., the metabolic and physiologic deviations that disrupt neurotransmitter synthesis and functioning). Also, these studies have not been designed or powered in such a way as to determine which of the multicomponents actually contributed to the positive outcomes.

To improve the recognition, prevention, and treatment of delirium in adults, several professional organizations have developed practice guidelines. These guidelines tend to be comprehensive and are based on research and expert clinical opinion. Despite the existence of guidelines, the process and outcomes of care in delirium remain inconsistent, indicating that much work remains to improve the care of individuals at risk for or experiencing delirium. Guidelines for delirium prevention, management, and treatment in children do not exist.

On the basis of this summary of the state of knowledge of delirium, the need for further study of delirium in all ages and care settings is clearly documented. Such study should focus on all aspects of delirium, including the epidemiology and natural history of delirium, to improve our understanding of the duration, severity, persistence, and recurrence of delirium and to better target and time interventions. Greater insight into the underlying pathologic mechanism(s) of delirium would enable more rigorous development and testing of the efficacy and effectiveness of interventions to prevent and treat delirium.

Marquis D. Foreman
Patricia E. H. Vermeersch

DELPHI TECHNIQUE

The Delphi technique is a research method used to identify key issues, to set priorities, and to improve decision making through aggregating the judgments of a group of individuals. The technique consists of using a series of mailed questionnaires to develop consensus among the participants without face-to-face participation. It provides the opportunity for broad participation and prevents any one member of the group from unduly influencing other members' responses. Feedback is given to panel members on the responses to each of the questionnaires. Thus, panel members communicate indirectly with each other in a limited, goal-directed manner.

The first questionnaire that is mailed asks participants to respond to a broad question. The responses to this questionnaire are then used to develop a more structured questionnaire. Each successive questionnaire is built on the previous one. The second questionnaire requests participants to review the items identified in the first questionnaire and to indicate their degree of agreement or disagreement with the items, to provide a rationale for their judgments, to add items that are missing, and to rank order the items according to their perceived priority. On return of the second questionnaire, the responses are reviewed, the items are clarified or added, and the mean degree of agreement and the ranking of each item are computed. In the third questionnaire, participants are asked to review the mean ranking from the second questionnaire and again to indicate their degree of agreement or disagreement and give their rationale if they disagree with the ranking. Additional questionnaires are sent until the group reaches consensus. Many variations of this procedure have been used, the number of questionnaires used ranging from three to seven.

To be eligible to participate as a panelist in a Delphi study, the respondent should (a) be personally concerned about the problem being studied, (b) have relevant information to share, (c) place a high priority on completing the Delphi questionnaire on schedule, and (d) believe that the information compiled will be of value to self and others. Several disadvantages of the Delphi technique limit its application. First, there must be adequate time for mailing the questionnaires, their return, and their analysis. Second, participants must have a high level of ability in written communication. And third, participants must be highly motivated to complete all the questionnaires.

The Delphi technique was first developed by the Rand Corporation as a forecasting tool in the 1960s, when investigators found that results of a Delphi survey produced better predictions than roundtable discussions. The technique was later used to solicit opinions of experts on atomic warfare as a means of defense. It has since been applied in diverse fields, such as industry, social services, and nursing because of its usefulness and accuracy in predicting and in prioritizing. Also, the Delphi technique has been used in nursing studies to identify priorities for practice and research.

Alice S. Demi

DEPRESSION AND CARDIOVASCULAR DISEASES

The American Heart Association has estimated that more than one third of American adults have at least one form of cardiovascular disease (Lloyd-Jones et al., 2009). Depression and cardiovascular disease are major public health problems that affect considerable percentage of American population and are among the top leading sources of functional impairment and disability. The annual economic burden of cardiovascular disease and depression are estimated to be approximately 500 and 70 billion, respectively (Lloyd-Jones et al., 2009; Soni, 2009).

Depression has been investigated through a variety of theoretical viewpoints, including psychodynamic, cognitive, sociologic, biologic, and the crisis models (Frank-Stromberg & Olsen, 1997). Clinical depression is a mood disorder in which the patient typically experiences depressed mood or anhedonia for at least 2 weeks. Depression may present either as a primary disorder or in association with other comorbid chronic conditions including cardiovascular disease. Most nurses working in outpatients or inpatients health care delivery settings have witnessed cardiac patients with depressed mood.

Depression is a common and important contributing risk factor of morbidity and mortality in patients with cardiovascular disease. Several studies have found that depression is a significant predictor of adverse patient outcomes in a variety of cardiovascular conditions such as heart failure, coronary artery disease, stroke, and myocardial infarction (Gump, Matthews, Eberly, & Chang, 2005; Penninx et al., 2001; Rutledge et al., 2006; Schulz et al., 2000; Williams et al., 2002). Findings from a large sample of Framingham Heart Study participants show that depressive symptom was associated with increased risk of developing stroke (Salaycik et al., 2007). Participants who were on antidepressant medications had similar risk level for developing stroke to those without medications (Salaycik et al., 2007). Other research results provide evidence of the role of hypothesized common genetic pathways for both depression and heart disease (Scherrer et al., 2003) and depressive symptoms and inflammatory markers in twin studies (Su et al., 2009).

Scientific research has provided several valid and reliable instruments for assessing depression in cardiovascular patients, such as the Center for Epidemiological Studies Depression Scale (Griffin et al., 2007; Lesman-Leegte et al., 2009), the Cardiac Depression Scale (Hare & Davis, 1996; Wise, Harris, & Carter, 2006), the Hamilton Depression Rating Scale (Koenig, Vandermeer, Chambers, Burr-Crutchfield, & Johnson, 2006), the Beck Depression Inventory II (Frasure-Smith et al., 2009), and the Geriatric Depression Scale (Salman & Lee, 2008), and has also provided evidence of favorable health benefits for depression mitigation in cardiac population. However, there is no sufficient evidence that depression treatment reduces cardiovascular events (Rees, Bennett, West, Davey, & Ebrahim, 2004; Salaycik et al., 2007).

Several large-scale community-based studies have been conducted. Penninx et al. (2001) examined the effect of minor depression and major depression on heart disease mortality. They found that patients with major depression, when compared with those who had minor depression, had significantly higher risk for cardiac mortality. These findings suggest that the severity of depression is related to higher cardiac mortality. In another study, Schulz et al. (2000) reported that depressed participants with heart failure at baseline had the highest mortality risk followed by stroke, intermittent claudication, angina pectoris, and myocardial infarction patients. Further, Cox proportional hazards regression model demonstrated that depressive symptoms were an independent predictor of mortality. In another study of the relationships between depression, coronary heart disease (CHD) incidence, and mortality, Ferketich, Schwartzbaum, Frid, and Moeschberger (2000) found that depressed men and women were at increased risk for incident of CHD events compared with nondepressed counterparts. Moreover, unlike depressed women, depressed men had increased risk of cardiac mortality.

Prospective population-based studies of depression also found an increased risk for CHD because of depression. Using data from the Yale Health and Aging Project (Williams et al., 2002) revealed that depressed individuals had demonstrated a 69% increase in the risk for incident of heart failure in comparison with nondepressed individuals. In addition, depressed participants were more likely to be women; consequently, depression was a significant risk factor of heart failure among women but not in men.

Research findings suggest that depression is a risk factor for cardiac morbidity and mortality. However, interventions that may reduce depression have failed to reduce depression-related cardiac outcomes (Berkman et al., 2003; Salaycik et al., 2007).

Recognition of the overlap between depression and cardiovascular disease has led to increased interest in finding plausible biobehavioral mechanisms and genetic basis that link them together. In fact, there is evidence to indicate that depression may contribute to increased incidence of cardiovascular events. This effect may be mediated by other behavioral and biological factors that play major roles in the development of negative cardiac outcomes. There are several known behavioral risk factors (e.g., sedentary life style, smoking, high-fat dietary intake) among depressed individuals that may contribute to the development of cardiac disease. In addition, recent research findings suggest that several biomarkers are implicated in both depression and cardiac disease pathogenesis. First, research showed that the hypothalamic–pituitary–adrenocortical axis is activated during depression, which increases sympathoadrenal activity. Consequently, some risk markers such as catecholamines, cortisol, and serotonin are elevated in both depression and some cardiac diseases. Second, depressed patients are at increased risk for rhythm disorders. Recent evidence indicates that cardiac patients who are depressed exhibit reduced heart rate variability, a known risk factor for sudden death in patients with CVD (Carney et al., 1995). Third, depressed patients are more likely to have platelet dysfunction that may have negative impact on the development and prognosis of cardiovascular disease such as atherosclerosis, acute coronary syndromes, and thrombosis. Finally, the research demonstrated a close relationship among proinflammatory cytokines such as interleukin-6 (IL-6), tumor necrosis factor α, depression, and incident of negative cardiac outcomes. Briefly, any single mechanism will fall short of capturing the underlying pathogenesis processes of depression and cardiac disease. Therefore, several mechanisms are needed to account for the development and progression of the two.

This overview from biopsychosocial perspective reveals that there is sufficient evidence to support an important association between depression and cardiac disease. It also suggests a number of significant directions for future research. Genetic studies to establish the cellular basis and to investigate the relationship between inflammation, depression, and cardiovascular disease are justified. Large, randomized clinical trials are needed to determine whether early detection of depression coupled with early intervention can prevent the development of cardiac disease or reduce the risk for incident of negative cardiac events. Another research priority is to elucidate the potential mediating factors related to depression, such as failure to comply with medical care, sedentary life style, eating habits and smoking. Also, biological studies are needed to quantify the latent effect of the alterations in the level of risk biomarkers (e.g., homocysteine, IL-6, tumor necrosis factor α, IL-2, serotonin, dopamine, cortisol, heart rate variability, and platelet activation), which could have negative effect on cardiac function. Moreover, depression seems to be more of a problem for women with cardiac disease than for men. Therefore, future studies are needed that focus on whether there is indeed a disproportionate weight of comorbid depression and cardiac outcomes among women.

Designing large-scale clinical trials that test biobehavioral research models along with considering both physiologic and behavioral outcomes is essential to a better understanding of the depression–cardiac disease communication. In addition, studies designed to develop a more clear account of psychosocial risk factors to cardiac disease are urgently needed. Finally, in an era of genetic research, identifying genes or gene expression mechanisms that may link depression and cardiac disease may pave the path for ultimate understanding of the link between depression and cardiovascular diseases. Studies of effectiveness of depression-specific interventions that address the need to improve mood status in cardiac patients are relevant to clinical nursing practice and research.

Ali Salman
Yi-Hui Lee

DEPRESSION IN FAMILIES

Depression is a major mental health problem affecting 25 million Americans and their families. By 2020, depression will be the third leading cause of disability worldwide (http://www.int/healthinfo/global_burden_disease/2004_report_update/en/index.html). Most people suffering from depression live with their families, usually their spouses and children, and the negative impact of depression on families has been well documented (Bulloch, Williams, Lavorato, & Patten, 2009; Feeny et al., 2009; Herr, Hammen, & Brennan, 2007; Keitner, Archambault, Ryan, & Miller, 2003). Nursing has long viewed families as a context for caring for the individual with depression but only recently has focused on the whole family (e.g., Ahlström, Skäsäter, & Danielson, 2009, 2010).

Depression is a rather vague descriptive term with a broad and varied meaning ranging from normal sadness and disappointment to a severe incapacitating psychiatric illness. William Styron (1990) describes in *Darkness Visible* the unsatisfactory descriptive nature of the term depression: "a noun with bland tonality and lacking any magisterial presence, used indifferently to describe the economic decline or rut in the ground, a true wimp of a word for such a major illness" (p. 37).

Depression is a universal mood state with all people experiencing a lowered mood or transient feelings of sadness related to negative life events such as loss. For most, the feelings of sadness or disappointment resolve with time and normal functioning resumes. In contrast, the symptoms associated with the psychiatric illness of depression can disrupt normal functioning, influence mortality and morbidity, and can cause a myriad of problems within the family (Hammen, Brennan, & Shih, 2004; Katon, 2009; Katon, Lin, & Kroenke, 2007; Patten et al., 2008; Uebelacker et al., 2008). The psychiatric illness of major depressive disorder (MDD) is diagnosed if five out of the following nine symptoms are present for a minimum of 2 weeks most of the day, nearly every day: (a) depressed mood, (b) loss of interest or pleasure in all activities, (c) decrease or increase in appetite or significant weight change, (d) insomnia or hypersomnia, (e) psychomotor retardation or agitation, (f) fatigue or loss of energy, (g) feelings of worthlessness or excessive guilt, (h) difficulty concentrating or indecisiveness, and (i) recurrent thoughts of death, recurrent suicide ideation or attempt (American Psychiatric Association, 1994). One of the five symptoms must be depressed mood or loss of interest or pleasure. Together, these symptoms cause significant functional impairment. In addition to MDD, depression is further classified in the *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition (American Psychiatric Association, 1994) into other diagnostic subtypes such as minor depression or dysthymia by signs and symptoms, onset, course, duration, and outcomes.

Family refers to any group that functions together to perform tasks related to survival, growth, safety, socialization, or health of the family. Family members can be related by marriage, birth, or adoption or can self-identify themselves as family. This definition is sufficiently broad to be inclusive of all types of families; however, it is recommended that researchers provide specific definitions of family appropriate to their research.

Genetic–biological research of depression in families includes genetic and biological marker studies (Holmans et al., 2007; Raison, Capuron, & Miller, 2006). The four research approaches to the genetics of mood are as follows: (a) familial loading studies (e.g., comparing families with depression to families without the disease), (b) studies evaluating the inheritability of mood disorders (e.g., twin studies), (c) studies of incidence of the risk for but not yet ill from mood disorders to determine biological or psychological antecedents, and (d) in theory, studies using genetic probes to determine which relatives and which phenotypes are associated with the genetic contributants to mood disorders (Suppes & Rush, 1996). The results of the familial loading studies are clear, whether the approach used is the "top-down" (i.e., studies of children with depressed parents; Currier, Mann, Oquendo, Galfalvy, & Mann, 2006) or the "bottom-up" approach (i.e., studies of relatives of depressed children; Mondimore et al., 2007; Silk et al., 2009). Children with depressed parents have a significantly greater risk of developing depressive disorders and other psychiatric disorders than do children with parents without depression (Abela, Zinck, Kryger, Zilber, & Hankin, 2009; Gibb, Benas, Grassia, & McGeary, 2009). Biological marker studies have focused on growth hormone, serotonergic and other neurotransmitter receptors, sleep, and hypothalamic–pituitary axis (Gibb et al., 2009; Raison et al., 2006; Sunderajan et al., 2010; Uher & McGuffin, 2008). There is increasing evidence from genetic studies about the genetic inheritance of depression (Holmans et al., 2007; Kendler, Gatz, Gardner, & Pederson, 2005) and the fact that abnormalities in biological markers persist throughout the life span. The majority of studies on genetic and biomarker studies in recent years have focused on maternal transmission (e.g., Gibb et al., 2009; Hammen et al., 2004) rather than paternal transmission of depression. Currier et al. (2006) is an exception in that they examined sex differences in parental transmission to both male and female offspring. Familial transmission rate of mood disorders from female probands was almost double that of males.

Psychosocial research of depression in families has focused on communication, marital problems and dissatisfaction, expressed emotion, problem solving, coping, and family functioning (Feeny et al., 2009; Lazary, Gonda, Benko, Gacser, & Bagdy, 2009; Silk et al., 2009). The evidence strongly supports that families who contain members with depression have greater impairment in all areas than matched control families and families whose members are diagnosed with alcohol dependence, adjustment disorders, schizophrenia, or bipolar disorders (Keitner et al., 2003). It is not surprising that depression has its most negative impact on families during acute depressive episodes (Miller et al., 1992), yet families with depressed members consistently experience more difficulties than matched control families even after initial treatment. Family members living with members with depression report greater health problems, with family members often being sufficiently distressed themselves to require therapeutic intervention (Abela et al., 2009; Ahlström et al., 2009).

A related and important body of psychosocial research focuses on depression as a coexisting condition for those suffering with a chronic or life-threatening illness (e.g., cancer, diabetes, and dementia). As an example, researchers have focused on the negative health outcomes of family caregivers in cancer and how caregiver outcomes also influence the cancer survivor's health outcomes (e.g., Kurtz, Kurtz, Given, & Given, 2005; Manne, Ostroff, Winkel, Grana, & Fox, 2005; Northouse et al., 2007; Segrin et al., 2006). These studies provide additional evidence of the negative impact of depression on the entire family when family members are living with members with depression plus chronic or life-threatening illness and for the importance of including family members in treatment interventions (Segrin & Badger, 2010).

Few studies have used qualitative approaches to understand family members' perspectives and treatment needs of living with a depressed person (Ahlström et al., 2009, 2010; Badger, 1996a, 1996b). Ahlström et al. (2009) found, in their qualitative descriptive study of seven families with an adult member who had MDD, five themes describing living with major depression. Family members (*n* = 18) described being forced to relinquish control in everyday life because the family members lost their energy and could not manage daily life. Further, feelings of uncertainty and instability affect the atmosphere within each of these families. Families also described living on the edge of the community as they isolated or secluded themselves from the wider community. Daily life was hard because responsibilities shifted between members, including the children within the family, because the adult depressed member could not assume usual roles and responsibilities. Finally, families describe that despite everything, the family as a unit and individually had ways of coping and finding some kinds of satisfaction. These results support findings from previous studies (Badger, 1996a) and provide perspectives of family members not normally included in depression research.

The role of the family in the treatment process has received less attention (e.g., Cardemil, Saeromi, Pinedo, & Miller, 2005). Systematic family interventions are few and are modeled after programs used with people with other psychiatric disorders and their families or after programs used with people with other illnesses (e.g., diabetes, dementia) and their families (Judge, Yarry, & Orsulic-Heras, 2010; Rosland, Heisler, Choi, Silveira, & Piette, 2010; Rosland & Piette, 2010). For example, Ryan et al. (2010) found that the Management of Depression Program was effective in helping patients with difficult-to-treat forms of depression and their family members to deal more effectively with persistent depression. The disease management approach, which was similar to approaches used in cancer or diabetes, improved perceived quality of life and functioning, reduced depressive symptoms, and improved perceptions of family functioning. Families continue to identify the need for information about how to facilitate communication, decrease negative interactions, handle stigma, and learn strategies for family coping with depression (Ahlström et al., 2009; Badger, 1996b). In theory, education, support, and partnering could move family members more quickly into recovery and prevent depression from becoming a recurrent and chronic illness for the entire family.

The majority of studies continue to focus on either the environmental or genetic factors that increase risk for depression in families, but future studies need to examine the relationships between genetic–biological predisposition and environment on prevention or treatment of depression (Jaffe & Price, 2007; Rutter, 2010). There have been fewer clinical trials validating the effectiveness of family interventions in treating depression, and future research should develop and test psychoeducational and support interventions with families. Although a common concern with research with families remains the unit of analysis (individual, dyad, or family as a whole), research representing all perspectives is needed for nursing to more fully understand and treat depression in families.

Terry A. Badger

DEPRESSION IN OLDER ADULTS

Depression is the most common mental disorder among older adults in the United States and one of the most disabling conditions among elderly persons worldwide (Kohler et al., 2010; Sable, Dunn, & Zisook, 2002). It is estimated that of the 35 million people 65 years and older, 2 million (approximately 6%) suffer from severe depression and another 5 million (14%) suffer from less severe forms of depression (National Institute of Mental Health, 2007; Varcarolis & Halter, 2010). The prevalence of clinical depression ranges from approximately 5% to 10% in community samples (medical outpatients), from 10% to 15% in medical inpatients, and from 10% to 25% in hospice and palliative care patients (Blazer, 2003; Djernes, 2006, King, Heisel, & Lyness, 2005). Furthermore, the rates of major depression among older adults range from 20% in nursing home residents and nearly

30% of older adults seen in primary care settings (Alexopoulos, 2005) to up to 42% of residents of long-term care facilities (Blazer, 2003; Djernes, 2006; Fiske, Wetherell, & Gatz, 2009). Approximately 50% of older adults who are hospitalized for medical illnesses or receiving long-term care experience clinically significant depression (Alexopoulos, 2005). Older adults are vulnerable to depression for a number of reasons. Approximately 80% have at least one chronic medical condition that can trigger depression (Jang, Bergman, Schonfeld, & Molinari, 2006; Sable et al., 2002). In addition, approximately 6 million older adults need assistance with their daily activities (Sable et al., 2002), and inability to meet one's own personal needs has been associated with increased vulnerability to late-life depression (Fiske et al., 2009).

Although depression is often viewed as a clinical syndrome with specific diagnostic criteria, depression has also been conceptualized as a mood state or as a collection of symptoms (Goodwin & Jamison, 2007). Because older adults may not meet the diagnostic criteria for the clinical syndrome, studies of older adults commonly use the term depression to mean depressive symptoms (Fiske et al., 2009; Martin et al., 2008). Clinical depression is usually qualified by an adjective to specify a particular type or form, including reactive, agitated, and psychotic. In addition, on the basis of etiology, depression is classified as endogenous (because of internal processes) or exogenous (because of external factors). Depression is termed primary when it is not preceded by any physical or psychiatric condition and secondary when preceded by another physical or psychiatric disorder. Finally, depression is classified as acute (less than 2 years duration) or chronic (more than 2 years). Clinical depression consists of characteristic signs and symptoms as well as type of onset, course, duration, and outcome. The *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision* (*DSM-IV-TR*; American Psychiatric Association, 2000) classifies clinical depression into major depressive disorder and dysthymic disorders. Major depression refers to a depression that meets specific diagnostic criteria for duration, impairment of functioning, and presence of a cluster of physiological and psychological symptoms (American Psychiatric Association, 2000). The *DSM-IV-TR* recognizes five further subtypes of major depressive disorder, called *specifiers*, in addition to noting the length, severity, and presence of psychotic features, namely, melancholic, atypical, catatonic, postpartum, and seasonal affective disorder. Dysthymia is a chronic, milder mood disturbance in which a person reports a low mood almost daily over a span of at least 2 years. The symptoms are not as severe as those for major depression, although people with dysthymia are vulnerable to secondary episodes of major depression (sometimes referred to as *double depression*; American Psychiatric Association, 2000).

Diagnosing depression in older adults is fraught with challenges. Depressed mood is one of the depressive symptoms that older adults may experience, but others may also experience a range of affective responses such as hopelessness and loss of interest in living (Fiske et al., 2009). Indeed, many studies have reported that in older adults, a predominant depressed mood may not be as prominent as symptoms of irritability, anxiety, or physical or somatic symptoms and changes in functioning (Alexopoulos, 2005; Fiske et al., 2009; Sable et al., 2002). In addition, symptoms of cognitive impairment that may occur in elders with depression may be mistaken for dementia (Charney et al., 2003; Olin et al., 2002; Sable et al., 2002). It is estimated that approximately 15% of older adults have depressive symptoms that do not meet diagnostic criteria specified by the *DSM-IV-TR* (American Psychiatric Association, 2000) for diagnosis of major depression (Alexopoulos, 2005). Nevertheless, these older adults can experience functional deficits in activities of daily living and instrumental activities of daily living that compromise their independence and quality of life. Indeed, the symptoms of depression can lead to total inability of the older individual to care for self and to relate to others. There is also a potential for persons with depression to negatively affect family members and others around them.

Not surprisingly, few elders in the community seek mental health services. Most depressed elders are seen by general practitioners for psychosomatic complaints. Part of the symptomatology of depression is a focus on physical problems, and this requires practitioners to carefully assess for depressive symptoms. Suicide is a risk factor for depressed older adults. The suicide rate for individuals 80 years and older is twice as that of the general population and is particularly high in older White males. Interestingly, most suicidal elders recently visited a general practitioner before their suicidal act.

Studies of risk factors for late-life depression have examined the effects of gender, age, and race/ethnicity. Like earlier depression, late-life depression more commonly strikes women than men (Chen, Chong, & Tsang, 2007) at an approximately 2:1 ratio (Kockler & Heun, 2002). Recent population-based studies have estimated the prevalence of geriatric depression at 4.4% for women and at 2.7% for men, whereas the estimated lifetime prevalence for clinical depression is approximately 20% in women and 10% in men (Kockler & Heun, 2002; Sable et al., 2002). Although female gender is a risk factor for depression throughout the life span, gender differences decrease with increasing age (Sable et al., 2002), and White men ages 80 to 84 years are at greatest risk for suicide (Kockler & Heun, 2002).

Cohort studies have shown that the oldest-old, those older than 85 years, are more likely than the younger-old, those between 65 and 74 years, to experience depressive symptoms (Blazer, 2003; Mehta et al., 2008; van't Veer-Tazelaar et al., 2008). Depression is thought to afflict older adults of all racial and ethnic backgrounds similarly (Alexopoulos, 2005; Bruce et al., 2002); however, its symptoms may not be consistent across racial/ethnic groups, making early diagnosis and treatment challenging.

Research on depression among older adults was ignored in the past and is still a neglected area. Clearly, much more nursing research is needed. It is critical that nurses assume leadership in disseminating information about the outcomes of a variety of treatments that can be used for depression in later life. There is a particular need to examine suicide in late life and to develop better assessment instruments for detecting suicidal ideation in elders.

Jaclene A. Zauszniewski
Abir K. Bekhet
May L. Wykle

DEPRESSION IN WOMEN

Depressive disorders (DDs) are widely occurring psychiatric illnesses that account for significant suffering and disability worldwide. Women have significantly higher rates of DD than do men, and the illness course is longer and more debilitating for most women. Well-established gender differences in the precipitants and outcomes of DDs further underscore the need to address DDs as a specific health problem for women. As these disorders first emerge in adolescent girls, commonly occur pre- and postpartum, and in menopause, and co-occur with a host of chronic illnesses, nurses in most practice settings will encounter women with DD and may be the sole available treatment provider.

Gender disparities in the rates of DD are most pronounced for major DD (MDD) and dysthymia (DYS) so these psychiatric illnesses are discussed here. Note that gender does play a role in the manifestations and outcomes of other kinds of DDs (e.g., bipolar disorder), but the overall incidence and presentation is similar for women and men

(Hendrick, Altshuler, Gitlin, Delrahim, & Hammen, 2000). MDD is defined as the presence of five or more symptoms (weight sleep, motoric, and cognitive changes) co-occurring nearly every day over a 2-week period (American Psychiatric Association, 2000). At least one of the symptoms experienced must include depressed mood or a loss of interest or pleasure in usually enjoyed activities. DYS is diagnosed when depressed mood is present nearly all of the time for two or more years and other depressive symptoms are also present (American Psychiatric Association, 2000). Rates of DD in women ranges from 7% to 15%, 1.5 to 2 times higher than rates obtained for men in developed countries (Seedat et al., 2009; Van de Velde, Bracke, & Levecque, 2010; Wang et al., 2010; Williams et al., 2010); in low- and middle-income countries, rates of DD are considerably higher (World Health Organization, 2008).

Although gender disparities in DD have long been recognized, the role gender plays in its development and maintenance is still evolving and remains hotly contested (Hammarstrom, Lehti, Danielsson, Bengs, & Johansson, 2009; Piccinelli & Wilkinson, 2000; Ussher, 2010; Wittchen, 2010; World Health Organization, 2009). The most dominant framework for understanding DD is the biomedical model (Hammarstrom et al., 2009), organized around the concepts of allostasis and hypothalamic–pituitary–adrenal dysregulation in individuals (Brummelte & Galea, 2010; Mcewen, 2003; Sterner & Kalynchuk, 2010). In broad strokes, it contends that DD is attributable to uncontrolled stressors, the perception of stressors as threats, and consequent excessive physiological response. The resulting wear and tear on stress regulatory organs in the central nervous system and periphery eventually leads to neurotransmitter disarray, hypothalamic–pituitary–adrenal dysregulation, and subsequently depressive symptoms. For women, uncontrolled and/or excessive stressors, cognitive schemas that alter stress perception, and gonadal hormones all have been implicated in the etiology of DD (Abramson & Alloy, 2006; Bromberger et al., 2010; Brummelte & Galea, 2010; Hammen, 2003; Noble, 2005; Stone, Gibb, & Coles, 2010).

Similarly, the preponderance of gender-specific theories of MDD and DYS are derived from the biomedical model and focus on the type and amount of stressors women experience and factors that mediate and moderate stress perception. Several investigators have determined, for example, that women have higher rates of interpersonal distress than do men, and these stressors contribute to their risk for depression (Brown, 2002; Hammen, 2003; Hammen, Brennan, & Shih, 2004; Kendler, Thornton, & Prescott, 2001; Sanathara, Gardner, Prescott, & Kendler, 2003; Zlotnick, Kohn, Keitner, & la Grotta, 2000). The most specific of these models is based on two decades of empirical work by Brown (2002) and Kendler, Hettema, Butera, Gardner, and Prescott (2003), which shows that when stressors are central to a woman's identity and contain elements of entrapment, humiliation, or loss, DD is likely to follow in the subsequent year. Cognitive vulnerability models that propose alterations in stress perception also have been proposed to account for gender disparities in DD (Brown, 2002; Hyde, Mezulis, & Abramson, 2008; Kendler, Gardner, & Prescott, 2002; Nolenhoeksema, 1994; Stone et al., 2010). Perceived hopelessness, neuroticism, brooding rumination, and negative self-evaluations are cognitive vulnerabilities that have been shown to contribute to risk for DD in women (Abramson & Alloy, 2006; Brown, 2002; Crane, Barnhofer, & Williams, 2007; Hyde et al., 2008; Kendler et al., 2002; Nolen-Hoeksema, 1994; Treynor, Gonzalez, & Nolen-Hoeksema, 2003). Social support also has been shown to be a key variable in moderating the effects of stressful events (Agrawal, Jacobson, Prescott, & Kendler, 2002; Brown, 2002; Kendler, Myers, & Prescott, 2005). Brown (2002), for example, has shown that having a confident or other key relationship reduces the likelihood of a depressive outcome following humiliation and entrapment. Note that a primary question underlying all of these studies is how DD in women is different from DD in men.

In contrast, feminist and other postmodern scholars assert that the search for gender differences inspired by the biomedical model of DD disavows and decontextualizes women's experience of DD and the sociocultural circumstances in which it is embedded (Lafrance, 2007; Marecek, 2006; Metzl & Angel, 2004; Stoppard, 1998). Social constructionists and critical social theorists (Burr, 2003; Fleming & Moloney, 1996; O'Grady, 2005), for example, contend that women's identity is centered in and shaped through their relationships with others, and these relationships are constrained by social and cultural norms about women that are reinforced by moral judgments made by the self and by others (Gilligan, 1982; Ridgeway & Smith-Lovin, 1999; West & Zimmerman, 1987). Women's choices in those relationships are further compromised by gendered workplace and social institutions that contribute to economic deprivation and other resource limitations (Belle & Doucet, 2003; Chen, Subramanian, Cevedo-Garcia, & Kawachi, 2005; Gray, 2005). Numerous studies on the basis of women's accounts of DD validate a gendered view of depression showing that identity loss, gender-based interpersonal demands including caregiving, and moral judgments about the proper role of women all contribute to the profound sadness and despair women experience, characterized as depression in biomedical models (Beck, 1993; Hurst, 2003; Jack, 1991; Lewis, 1987; McMullen, 2003; Scattolon & Stoppard, 1999; Schreiber, 2001). Such woman-centered perspectives on DD have been extended to include embodiment as an important concept in understanding women's experiences of depression (Fuchs & Schlimme, 2009). Such a "materialist-discursive perspective" of DD is a beginning attempt to explain how the physical and emotional demands associated with fulfilling gender expectations leaves women with so few resources that they become incapable of self-care and social engagement (Lafrance & Stoppard, 2007; Stoppard, 1998; Ussher, 2010).

Randomized controlled trials that establish the evidence base for treatment largely neglect the role of gender in treatment design, response, or outcome. The National Institute of Mental Health Treatment of Depression Collaborative Research program, for example, examined treatment differences in outcome among those treated with medication and different types of psychotherapy; none of the treatments tested were specifically modified to address factors that may contribute to DD in women (Elkin et al., 1989). Still, follow-up studies showed that were no gender-related differences in outcomes from treatment, even when several gender-related factors were examined (Zlotnick, Shea, Pilkonis, Elkin, & Ryan, 1996). Similarly, the Treatment for Adolescents with Depression Study tested medication and cognitive-behavioral therapy without regard to gender (Domino et al., 2009). No published accounts of the effects of gender in this study were noted. Gender-sensitive treatments also were not used in several randomized trials conducted in primary care settings examining collaborative care for DD; gender differences in outcomes, when reported, were not found (Bush et al., 2004). The Sequenced Treatment Alternatives to Relieve Depression study is the most recent of the randomized controlled trials to establish evidence-based treatment for DD, again using treatments unmodified for gender concerns or based on women-centered theoretical approaches (Fava et al., 2003). Although specific gender differences in the antecedents and course of MDD were evident in the Sequenced Treatment Alternatives to Relieve Depression study participants, the investigators do not discuss the need for interventions that target women's concerns (Marcus et al., 2005). It is important to note that although no gender differences in outcome are noted among the evidence-based treatments used in these major treatment studies, the primary outcome of number and severity of depressive symptoms used in these studies may be sufficiently imprecise to ascertain true differences in short- and long-term functioning, especially given the ongoing gender-related challenges women face.

There is little guidance in the research literature about what constitutes women-centered treatment for DD, and no effectiveness studies of such treatment were detected. Theorists writing in this area agree that narrative therapy informed by feminist principles may be the most fruitful approach to addressing the causes and outcomes of DD experienced by women (Gremillion, 2004; Lee, 1997; McQuaide, 1999). Such an approach begins to uncover individual, social, and cultural level gender influences on women who are experiencing DD that define their identity and determine their actions within important relationships. Therapy then focuses on identity work that results in a new definition of self and self-in-relationship that contains less rigid boundaries and moral judgments about gender roles and responsibilities. It is instructive that the studies focusing on women's experience of recovery from DD consistently report that rejection of gender stereotypes as a model for the self, establishing a new self-narrative, and improving self-care in the context of a therapy relationship initiated an ongoing recovery process (Berggren-Clive, 1998; Chen, Wang, Chung, Tseng, & Chou, 2006; Chernomas, 1997; Lafrance & Stoppard, 2006; Peden, 1993; Schreiber, 1998). A few intervention studies using women-centered strategies to treat depression in women are beginning to appear in the literature (Laitinen & Ettorre, 2004; Ussher, Hunter, & Cariss, 2002) but significant work is required to establish evidence that women-centered interventions contribute to the long-term well-being for women.

Women-centered models of DD are based on different epistemologies and use different methodological approaches to interpret the manifestations and outcomes of DD. With women-centered understandings of DD positioned in opposition of the biomedical model and the latter dominating extant research about causality, treatment, and outcome, the impasse between the two has prevented the development of theory and practice that would serve to reduce the rates and impact of DD on women. Yet careful examination of scholarship and research emerging from both traditions shows overlap in findings. For example, both traditions note the centrality of interpersonal distress to women's identity and how relationship disruption can contribute to DD in women (Brown, 2002; Hammen, 2003; Hammen et al., 2004; Jack, 1991; Ridgeway & Smith-Lovin, 1999). Both theory and practice would be advanced when women-centered and biomedical perspectives are brought together to understand how DD develops and is maintained in social and cultural systems of inequality and how treatment can be directed at the individual, family, social, and cultural level to improve outcomes (Stoppard, 1998; Ussher, 2010). Should that occur, women-centered approaches can be designed and tested alongside conventional treatments to effect long-term reduction in the suffering and disability experienced by women.

Emily J. Hauenstein

DESCRIPTIVE RESEARCH

Descriptive research involves collecting and/or analyzing data to characterize a group, concept, or phenomenon. It can use quantitative or qualitative (including naturalistic) methodologies. Quantitative descriptive methodologies include surveys, measurement tools, chart or record reviews, physiological measurements, meta-analyses, and secondary data analyses. Qualitative descriptive methodologies include interviews, focus groups, content analyses, reviews of literature, observational studies, case studies, life histories, grounded theory studies, concept analyses, ethnographic studies, and phenomenological studies. Many qualitative methodologies use exploratory as well as descriptive techniques.

Descriptive studies are often used when little research has been done in an area to clarify and define new concepts or phenomena, to increase understanding of a phenomenon from another experiential perspective, or to obtain a fresh perspective on a well-researched topic. Also, the formulation and the testing of measurement tools (e.g., to measure depression, anxiety, or quality of life) use descriptive research techniques. The development and refinement of these tools will continue, with increasing emphasis on outcomes research as nurses are required to demonstrate how their interventions make a difference for patients.

Descriptive research has comprised the majority of nursing studies, although experimental and quasi-experimental studies in nursing are on the rise. Early research efforts were focused on descriptive epidemiological studies. Nightingale's pioneering work is a well-known example of this type of research. Well schooled in mathematics and statistics, Nightingale created elaborate charts demonstrating morbidity and mortality trends of soldiers during and after the Crimean War. Her detailed record keeping and graphic representation of these data convinced officials of the need to improve sanitary conditions for soldiers, which drastically reduced mortality rates (Cohen, 1984).

The progress in descriptive research activity in nursing has been influenced by several events and movements over the past several decades: advanced degree education in nursing, philosophical debate about the role of nursing and nursing research in the scientific community, establishment of centers for nursing research, and formation of an agenda for knowledge development in nursing.

With the help of federal traineeship money, the earliest doctorally prepared nurses obtained degrees in basic science programs. The adoption and rejection of the logical positivist view of science helped clarify linkages between philosophy, theory, and method. At one extreme, nurse scientists and theorists argued that the future of nursing knowledge development lay in empirical studies that allowed for repeated observational statements under a variety of conditions. It was believed that one ultimate truth could be found after repeated objective observations, which would eventually lead to discovery of universal laws.

Critics of the logical empiricist approach argued that truth is influenced by history, context, and a chosen methodology and is constantly in a state of flux. What is humanly unobservable one day may be observable with the help of technological innovation another day. Although logical positivism is no longer espoused in nursing theory and science, its role was crucial in initiating dialogue about what nursing knowledge is and how research in nursing should be advanced. These dialogues have helped swing the pendulum from valuing experimental research as the gold standard in nursing to recognizing the important role of descriptive and exploratory research.

Over the years, nursing leaders have struggled to establish which approach to knowledge development is appropriate and necessary for nursing. Dickoff, James, and Wiedenbach's (1968) four levels of theory for nursing included the most basic type, factor-isolating theory, as the product of descriptive studies, with higher level theories built on the necessary base of this first level of theory. Therefore, descriptive research is a necessary base to provide a foundation of support for intervention studies, with the ultimate goal of using research findings in practice. Meta-analysis, which is a useful tool that synthesizes extant nursing research, was initially applied to experimental studies. Application of this technique to descriptive studies can also help determine when a phenomenon is ready for testing with intervention studies. Synthesis of qualitative research, typically called qualitative metasynthesis (Thorne, 2009), continues to evolve and develop. In addition, methods for research integration and mixed methods synthesis are developing to combine both qualitatively and quantitatively derived findings (Thorne, 2009). Despite the complex nature of this synthesis, work on these approaches continues because nurses are motivated to extend nursing knowledge.

Public and private funding of nursing research has allowed for an expansion of nursing knowledge based in research. Of the many studies funded by the National Institute of Nursing Research, Sigma Theta Tau, and private foundations, descriptive research continues to command a large portion of research dollars.

Many nursing organizations and associations have delineated priorities for a nursing research agenda that include health promotion, disease prevention, and wellness, eliminating health disparities, improving quality of life, and improving end-of-life care and research on minority groups and culturally different views of health and illness. Adding to nursing's knowledge base in these areas will require using descriptive research along with other research methodologies and incorporating the results of these studies into nursing practice and research endeavors.

Anita J. Tarzian
Marlene Zichi Cohen

DIABETES RESEARCH

Diabetes is a chronic, debilitating disease affecting individuals of all ages and diverse ethnic populations. Nurses deliver evidence-based care for persons living with diabetes in primary care settings, hospitals, and long-term care facilities. Key research efforts are imperative to ensuring optimal health outcomes for those afflicted by this potentially, devastating disease. The purpose of this entry is to review major historical, societal, economical and contemporary practice issues, theoretical and research perspectives, and future directions.

The care and treatment of individuals with diabetes was revolutionized with the discovery of insulin in 1921 by Drs. Frederick Banting and Charles Best at the University of Toronto. One year later, insulin for human use was administered to save the life of a 14-year-old boy who was dying from the disease (Banting, Best, Collip, Campbell, & Fletcher, 1922). The health care community, persons living with diabetes, and their families owe much to Banting et al. (1922) for their groundbreaking discovery. Since then, tremendous strides in scientific discovery for diabetes treatment have occurred to allow optimal glycemic control. Despite these advances, our society is faced with a significant economic burden because of the increasing numbers of individuals diagnosed with diabetes annually. According to the most current available data from the *National Diabetes Statistics 2007* fact sheet (National Institute of Diabetes and Digestive and Kidney Diseases [NIDDK], 2008), diabetes was the seventh leading cause of death as reported on U.S. death certificates in 2006. The major contributor to mortality risk was cardiovascular disease, which has rates two to four times greater for adults with diabetes than those without the disease. Estimated U.S. diabetes prevalence rates total 23.6 million people, with 17.9 million diagnosed and 5.7 million who remain undiagnosed (NIDDK, 2008).

The major types of diabetes are type 1 and type 2 diabetes. In adults, approximately 90% have type 2 diabetes, with the remainder diagnosed with type 1 diabetes. The etiology of type 2 diabetes includes insulin resistance and insufficient insulin secretion. Type 1 diabetes is caused by autoimmune pancreatic beta-cell destruction that requires exogenous insulin administration. Although the majority of persons with type 1 diabetes develop the disease during childhood, increasing numbers of youth have been diagnosed with type 2 diabetes in the past decade, particularly because of childhood obesity, inadequate nutrition, and sedentary lifestyles. Similar to the higher rates of obesity that are seen in African Americans and Hispanics (Ogden, Carroll, Curtin, Lamb, & Flegal, 2010), the incidence of type 2 diabetes is also greater in these populations than in non-Hispanic Whites (Mayer-Davis, 2008). Epidemiological trends show that one in three youth in the 2000 U.S. birth cohort will develop diabetes during their lifetime (Narayan, Boyle, Thompson, Sorensen, & Williamson, 2003).

Projections of the numbers of individuals who will be diagnosed with diabetes indicate steady growth to epic proportions in elders older than of 65 years and in African and Native Americans and Hispanics (Boyle et al., 2001; Engelgau et al., 2004). In 2007, the estimate for the prevalence in adults of prediabetes, a condition where fasting blood glucose levels are higher than normal (i.e., 100–125 mg/dl) but not yet at the level to be deemed diabetes (i.e., >126 mg/dl), was 57 million (NIDDK, 2008). Diabetes-related complications such as heart disease, stroke, kidney disease, blindness, and premature death are all more common in African and Native Americans or Hispanics versus non-Hispanic White adults (NIDDK, 2010). In 2007, the total estimated cost of diabetes was US$174 billion, including US$116 billion in excess medical expenditures and US$58 billion in reduced national productivity (American Diabetes Association [ADA], 2008). Given these sobering statistics, there is strong evidence that the United States will face ongoing public health challenges to address the potential burgeoning onslaught of individuals who face declining health status, quality of life (QoL), and lost productivity related to an earlier onset of diabetes.

With the continual onslaught of persons afflicted with diabetes, research funding for newer pharmaceutical agents, technologies, monitoring devices, and clinical trials is needed more than ever. The Institute of Medicine (2009a) recently identified national priorities for comparative effectiveness research to aid in the translation of best practices for preventing, treating, monitoring and delivering care. Best practices result from the most informed decisions of clinicians, consumers of care, and policy makers generated by well-designed investigations that explore alternative therapeutic approaches. The conundrum facing nurse researchers is how best to participate in transdisciplinary teams to develop and to evaluate interventions that promote effective, individualized self-management for optimal glycemic control in persons with diabetes and to also implement screening procedures for early detection and prevention in those most at risk for developing diabetes.

Tighter glycemic control is shown to decrease the progression of microvascular diabetes complications in persons with type 1 and type 2 diabetes (Diabetes Control and Complications Trial [DCCT] Research Group, 1993); United Kingdom Prospective Diabetes Study [UKPDS] Group, 1998). Longitudinal follow-up of individuals enrolled in the DCCT, called the Epidemiology of Diabetes Interventions and Complications (EDIC) trial (Nathan et al., 2005) and the UKPDS studies, demonstrated that intensive glucose control early in the course of the disease decreased the incidence of myocardial infarctions and cardiovascular mortality (Brown, Reynolds, & Bruemmer, 2010). In contrast, the Action to Control Cardiovascular Risk in Diabetes (ACCORD) trial (Gerstein et al., 2008), the Action in Diabetes and Vascular Disease: Preterax and Diamicron Modified Release Controlled Evaluation (ADVANCE) trial (Patel et al., 2008), and the Veterans Affairs Diabetes Trial (VADT; Duckworth et al., 2009) results suggested that intensive glycemic control to near normoglycemia (e.g., A1C, 6%–6.5%) in older adults with type 2 diabetes had either no effect on cardiovascular outcomes or potentially detrimental effects because of severe hypoglycemia (Brown et al., 2010).

On the basis of evidence from the UKPDS, DCCT, and EDIC trials and the current recommendations of the ADA, the American College of Cardiology Foundation, and the American Heart Association, the target A1C level for adults should remain at 7% (Skyler et al., 2009). To minimize risks of hypoglycemia, the ADA recommends A1C levels <8% for school-age children and <7.5% for adolescents (ADA, 2010). To prevent microvascular or macrovascular complications in adults with type 2 diabetes <10 years, a more stringent A1C level <7% may be appropriate. However, on the basis of post hoc findings of the VADT, persons older than 60 years with 12 years of diabetes duration experienced cardiovascular events that were either unchanged or increased with intensive glycemic control (Duckworth, 2009). Current evidence supports the need for further investigation of individualized goals for diabetes self-management, particularly for those with longstanding diabetes and with consideration of comorbid conditions, risks for severe hypoglycemia, and life expectancy.

Nurse researchers are addressing major strategies for developing and evaluating interventions to improve self-management and diabetes outcomes. Presented here is an overview of some of the current theoretical approaches, study aims, and outcomes of nurse-led investigations. Although this information is not intended to provide an exhaustive review, it does demonstrate a focus on studies supported by the National Institutes of Health and information retrieved from the National Institutes of Health Research Portfolio Online Reporting Tools (http://projectreporter.nih.gov/reporter.cfm). Theoretical perspectives used to guide diabetes research conducted by nurse researchers are based on the concepts of social learning, self-efficacy, coping, self-management, cultural competence, stages of change, and chronic care.

The majority of nursing studies focus on adults with type 2 diabetes. Research conducted by Sharon Brown at the University of Texas at Austin has revealed that culturally competent self-management education interventions resulted in improved glycemic control, with greater improvement related to session attendance (Brown et al., 2005). Her current work consists of systematically synthesizing the extant research on psychological, motivational, and behavioral factors affecting diabetes outcomes using meta-analysis and model testing to best inform clinical guidelines. Sandra Dunbar at Emory University is developing and testing an integrated self-care intervention for heart failure patients with diabetes for its effects on health-related QoL, physical function, health resource utilization, and cost-effectiveness. With a focus on prediabetes, Deborah Vincent at the University of Arizona is examining the feasibility of translating and culturally tailoring the Diabetes Prevention Program (Knowler et al., 2002) into a community-based program for overweight Mexican American adults and estimating the effect on weight loss.

Studies of youths with diabetes are addressing the needs of adolescents and their families. Family and developmental perspectives are incorporated into the designs of these studies. Margaret Grey at Yale University is conducting a longitudinal study using QoL and glycemic control to evaluate the effects of an Internet coping skills training program in youths with type 1 diabetes. This investigation is an extension of the longest ongoing clinical trial specifically testing the efficacy of an intervention for youths who have type 1 diabetes. In the original face-to-face intervention, teens who received coping skills training and intensive diabetes management had significantly better glycemic control and QoL than youths receiving intensive management alone after 1 year (Grey, Boland, Davidson, Li, & Tamborlane, 2000). Carol Dashiff at the University of Alabama at Birmingham is conducting a feasibility trial of a joint parent and adolescent (ages 15–17 years) psychoeducational multifamily group autonomy support program to facilitate adolescent self-management of type 1 diabetes during the transition from middle to late adolescence. Consistent with the overall aim of preventing long-term diabetes-related complications as teens make the transition to adulthood, Melissa Spezia Faulkner at the University of Arizona is investigating personalized exercise interventions for adolescents with diabetes and has shown that those who attain 60 minutes of exercise bouts improve their overall cardiovascular fitness (Faulkner, Michaliszyn, & Hepworth, 2010).

Improvements in glycemic control through individualized interventions developed and tested through scientific inquiry will increase the odds for minimizing complications of diabetes, which affect personal QoL and productivity and contribute to the economic burden associated with diabetes care. Future research must embrace not only better outcomes, including decreasing health disparities in minorities, but also the enormous need for prevention in those predisposed to the disease. Newer technologies for insulin delivery, continuous glucose sensing, and genetic engineering for individual therapies are on the horizon. Through their leadership in transdisciplinary science, nurse researchers will remain integral to the advancement of evidence-based diabetes care.

Melissa Spezia Faulkner

DISCOURSE ANALYSIS

Discourse analysis is a methodology that has multiple meanings referring to a wide range of analytical procedures. Such methodological diversity has resulted not only from various philosophical traditions that treat discourse differently but also from conceptualization of discourse analysis by diverse disciplines that emphasize different aspects or meanings of discourse. From its multidisciplinary orientation, discourse analysis as a research methodology is defined in a most simplistic form as that encompassing analytical approaches applied to written or spoken linguistic texts to derive knowledge regarding language use and meanings in text in relation to contexts of discursive acts and texts (Alba-Juez, 2009). Specific analytic procedures within discourse analysis are varied according to philosophical and paradigmatic orientations.

Discourse is viewed as an appropriate subject matter for research by various disciplines, including linguistics, philosophy, anthropology, sociology, psychology, information science, literary criticism, journalism, and practice disciplines such as nursing and medicine. Although the term *discourse* in relation to discourse analysis is defined and used differently in linguistics and in other disciplines, discourse refers to language in use as connected speech or written texts produced in social contexts rather than in terms of single sentences considered in terms of grammar and syntax. Discourse analysis deals with texts of conversations and written texts produced among individuals as well as those produced within larger social and historical environments, such as journal articles or newspaper accounts that are not directed to specific individuals as their audiences. Discourse as the object of analysis is usually obtained from natural occurrences rather than from constructions designed solely for the purpose of analysis.

The term *discourse* in discourse analysis is commonly accepted as a complex noun with the previously mentioned definition. However, the use of “a discourse” or “discourses” can be often found in discourse analysis with the poststructural, critical perspective. However, the current literature abounds with both usages of the term (i.e., “discourse” and “a discourse”), not necessarily used consistently within one specific perspective.

Discourse analysis has its historic origin in the ancient Greek differentiation of grammar and rhetoric in language use (van Dijk, 1985). Although the study of rhetoric was differentiated from the study of grammar in linguistics throughout the centuries, it was not until the middle of the twentieth century that a more formal approach to discourse analysis gained its appeal in linguistics. Hence, "pragmatics" in linguistics emphasizing discourse analysis has been separately developed, in contrast to the study of language proper that focuses on formal grammatical, syntactical, and morphological structures. Following this modern revisit in linguistics, many other disciplines have begun to take discourse as the proper subject of their scientific study. Although there are cross-disciplinary discussions of the methodology and application of various approaches of discourse analysis, there is no unified, integrated approach to discourse analysis. The literature across the disciplines suggests that there are at least three general perspectives within discourse analysis: (a) the linguistic perspective, (b) the conversation perspective, and (c) the ideology/critical perspective.

The linguistic perspective takes discourse as text produced by language use in either speech or writing. Thus, discourse text for this perspective can be from interpersonal conversations, written texts, or speech expositions such as testimonies. This perspective encompasses the formal pragmatics in linguistics, sociolinguistics in sociology, and ethnography of communication and ethnopoetics in anthropology. Hence, within this perspective, there are several different methodological approaches to discourse analysis. Even within each orientation, there are variations in the ways discourse texts are analyzed, depending on the frame within which various contextual features are brought into the analytic schema.

The formal pragmatics that had its beginning with Z. S. Harris (1952) has been recast by the speech act theory in the philosophical tradition of J. L. Austin (1975) and J. R. Searle (1979) and by the poetics of the literary study. Discourse analysis from the formal pragmatics orientation addresses such aspects as speech competence with respect to discursive rules, text grammar, discourse comprehension, or discourse organization.

Sociolinguistics as a branch of sociology is a study of language use within the functional paradigm of sociology, which views social life in relation to larger social structures such as gender, status, social class, role, and ethnicity. Sociolinguists are concerned with ways in which people use different linguistic forms according to macrostructural and contextual differences.

Anthropological approaches in the linguistic perspective are ethnopoetics and ethnography of communication. Ethnopoetics is the study of oral discourse as speech art in the tradition of literary analysis and is concerned with the structures of verbal aesthetics. The focus is on the poetic patterning of discourse within different cultures. On the other hand, ethnography of communication, advanced by Hymes (1964), is concerned with general language use as practiced in specific sociocultural context. Ethnography of communication, done either from the cross-cultural, comparative orientation or from the single-culture orientation, is based on the assumption that discourse should be studied, positing it within the dynamics and patterns of discourse events in a given cultural context. In all these branches of the linguistic perspective, the emphasis is on the linguistic forms as used in social life.

The conversation perspective takes discourse as conversational texts; it has been developed from the ethnomethodological tradition of Garfinkel (1967) in sociology. In this tradition, Sacks (1992) and others pioneered conversation analysis as a form of discourse analysis. Conversation analysis views discourse as a stream of sequentially organized discursive components that are designed jointly by participants of conversation applying a set of social and conversational rules. Conversation analysis studies rules that participants in conversation use to carry on and accomplish interaction, such as topic organization, turn taking, and use of response tokens. In recent years, however, conversation analysis has extended to include behavioral aspects of interaction (e.g., gesture, gaze, and laughter) as its analytical components. The use of transcripts and transcription symbols has been extensively developed in this perspective.

Discourse analysis in the ideological/critical perspective differs from the other two perspectives in its emphasis on the nature of discourse as historically constructed and constrained by idea and knowledge. Discourse in this perspective is not considered in terms of linguistic form or interactive patterning. Rather, discourse is not only what is said or written but also is viewed within the discursive conditions that produce imagined forms of life in given local, historical, and sociocultural junctures and thus is embedded in and with power and ideology.

This perspective was represented by poststructuralists such as Foucault (1972), Derrida (1978), and Lyotard (1984), who viewed discourse analysis not simply as an analytical process but as a critique and intervention against marginalization and repression of other forms of knowledge and discursive possibilities. Discourse analysis in this perspective is oriented to revealing sociohistorical functions and power relations embedded in statements of talks and texts as well as what Foucault called "systemic archives," of which statements form a part. Specifically, critical discourse analysis from this perspective takes up the approach to reveal and critique how power systematically entrenches into human's discursive acts and their products (i.e., texts) through domination, abuse, and distortions and is open to applying various analytic techniques (Fairclough, 1995; Power, 1996; van Dijk, 2001; Wodak & Krzyzanowski, 2008).

The foregoing discussion indicates that discourse analysis is not a unified approach to studying language use. Although three perspectives are identified for this method, there is a blurring of differences among the perspectives. The method, however, remains multidisciplinary. In nursing, discourse analysis is being applied with all three perspectives. Discourse analysis with the linguistic perspective has been applied to study discourse comprehension in client–nurse interactions or discourse organization of nurses' notes and to analyze various discourses on such topics as abortion, individualized care, and professionalism in the nursing literature related to macrostructural or contextual factors.

On the other hand, discourse analysis with the conversation perspective has been applied to the study of turn taking and topic organization in client–nurse interactions and to examine the dynamics of home visiting. Within the ideological/critical perspective, discourse analysis has been applied to examine nursing documentation as a form of power relations, to analyze discourse of nursing diagnosis in the nursing literature, and to explicate the language of sexuality, menopause, and abortion as power relations and ideology. Written texts produced by clients and nurses and client–nurse conversations as well as texts in the public domain are the rich sources for applying discourse analysis to study the language-in-use from these perspectives.

Hesook Suzie Kim

DOCTORAL EDUCATION

The landscape of doctoral nursing education has changed markedly during the past decade. Doctoral education in nursing includes two general types of programs offering distinctly different types of degrees. The basic differentiation is between research-focused and practice-focused programs. Research-focused doctoral programs, traditionally the most numerous, are designed to prepare the graduate for a lifetime of scholarship and research and are often the preferred preparation for faculty positions, particularly in research-intensive institutions. Research-focused doctoral programs offer either the academic doctorate (doctor of philosophy [PhD]) or the professional doctor of nursing science (DNS, DSN, or DNSc) degree; one research-focused program offers the doctor of education (EdD). Practice-focused doctoral programs, which are increasing very rapidly in number, are designed to prepare the nurse for specialized advanced practice and administrative roles and for practice leadership. They often prepare individuals for faculty roles focused in clinical teaching. The degree title that is most commonly offered by practice-focused programs is the doctor of nursing practice (DNP or DrNP). Currently, more than 120 institutions in 36 states plus the District of Columbia offer DNP programs, and more than 161 are planned. The number of research-focused doctoral programs has also increased but more slowly; they currently number 120, and 8 more are being developed. Many institutions offer both types of doctoral programs.

Most research-focused programs offer the PhD. It is the doctoral degree that is universally recognized and accepted and enjoys considerable prestige, particularly in academia. Curricula for programs leading to research-focused doctorates typically contain a core of required courses addressing nursing theory and theory development strategies and various aspects of research methodology and statistics. In addition, students usually are required to deepen their substantive expertise in a specialized area of nursing knowledge and research by selecting courses in nursing and related disciplines (cognates), becoming involved in hands-on research-related experiences such as research residencies or practice and research assistantships and conducting a major independent research project that culminates in a written dissertation. Because graduates of research-focused doctoral programs often are employed as faculty, many PhD programs provide opportunities for students to study instructional technology and pedagogy and to have practicum experiences teaching students. Typically, half or more of the credits focus on research methodology and actual conduct of research. On the average, full-time students complete their doctoral study in 4 years: 2 years to complete the course work and an additional 2 years to complete the dissertation.

An important trend in nursing is the rapid increase in the number and size of practice-focused doctoral programs. Stimulated by position papers and policy statements by the American Association of Colleges of Nursing (in 2004) and several other professional organizations, practice-focused doctoral programs are now viewed as a viable alternative to the academic doctorate for individuals who wish to attain the highest level of expertise in clinical practice. Enrollment in DNP programs currently outnumbers that in PhD programs in nursing. The curricula differ considerably from those of the research-focused programs, with the major differences being that practice-focused programs typically include fewer credits addressing research and require both an intensive practicum experience and a final project that differs from a dissertation. Areas of content that are common to virtually all of the practice-focused doctoral programs include the following: the scientific underpinnings for practice; ethical underpinnings for practice; advanced practice in a given specialty area of nursing; organization and system leadership, including organizational change strategies and quality improvement; analytic methodologies related to the evaluation of practice, application of evidence to practice, and practice-focused scholarship; use of technology and information; development, application, and evaluation of health policy; health promotion and disease prevention for individuals and populations; and interdisciplinary collaboration. In addition, programs provide the basis for advanced specialized expertise in at least one area of nursing practice. A dissertation is generally not required; however, most programs include a practice-related project and a residency experience. Some practice-focused doctoral programs limit their specialty areas to those concerned with the direct care of patients as implemented in advanced practice nursing roles (i.e., nurse practitioner, nurse midwife, nurse anesthetist, clinical nurse specialist), whereas others also include specialty preparation in administration or executive practice, informatics, or health policy.

Entry into practice-focused doctoral programs can be either postbaccalaureate or postmaster's degree. Some postmaster's programs require students to enter with specialty preparation and/or specialty certification. In all cases, graduates are expected to provide visionary leadership in the practice arena as advanced practice nurses, program managers and evaluators, administrators, or information specialists. Graduates of practice-focused doctoral programs frequently assume positions as clinical educators in schools of nursing. Consequently, many programs include a faculty role preparation option.

Historically, doctoral nursing education began at Teachers College, Columbia University, and at New York University in the 1920s. After a 30-year hiatus during which no new programs were opened, interest in doctoral education was rekindled; by the end of the 1970s, a total of 18 programs had been initiated. During the 1980s, the number of programs more than doubled, and with the rapid increase in programs and enrollments came concern about maintaining high quality. The American Association of Colleges of Nursing took and continues to maintain a leadership role in developing indicators of quality regarding student and faculty qualifications, curriculum content, administrative patterns, research support, and other support resources. Maintaining high quality has remained a consistent focus, and over time, ideas about the nature of scholarship and doctoral education have been refined. Emphasis has expanded from focusing primarily on the tools of scholarship to addressing the importance of growing the body of substantive knowledge that underpins nursing practice and to doing so in an environment of cross-disciplinary team science.

In addition to the growing interest in practice-focused doctoral programs, an important trend is that increasingly students are being encouraged to progress as quickly as possible toward the terminal degree. Fueled in part by a growing faculty shortage and the need to produce more doctoral graduates, programs are increasingly streamlining progression between degree levels, combining more than one degree in a program (e.g., MS and PhD), and eliminating work experience as a prerequisite to admission. As a result, the profile of the "typical" doctoral student is changing. The average age of doctoral nursing students is gradually decreasing, and students often enter doctoral study from clinical as well as academic backgrounds.

Doctoral education continues to be an arena of excitement and innovation in nursing education. The need for doctoral graduates continues to escalate, yet the challenge to maintain quality in the face of rapid change is of paramount concern. For individuals, the doctorate is the pinnacle of attainment in nursing education, and for institutions, it is the pinnacle of academic attainment. The virtually universal acceptance of the doctorate as the terminal degree signifies nursing's status as a true academic discipline.

Elizabeth R. Lenz

DOMESTIC VIOLENCE

Domestic violence, also called intimate partner violence or partner violence, is violence perpetrated by one partner against the other partner in an intimate relationship. An intimate partner may be a current or former spouse, a cohabiting partner, a boyfriend or girlfriend, or a dating partner. Domestic violence may occur in opposite-sex or same-sex relationships and can continue after the relationship has ended. Domestic violence may take a variety of forms, including physical violence (e.g., shoving, grabbing, hitting, kicking, choking, beating, threatening with or using a gun or knife), psychological abuse or maltreatment (e.g., shouting, insulting, ridiculing, isolating, monitoring, or threatening harm), and sexual assault (e.g., forced or coerced sex).

Domestic violence is pervasive and a global problem. Worldwide, lifetime prevalence rates of physical violence, sexual assault, or both by an intimate partner range between 15% and 71%, with most estimates falling between 30% and 60% (Garcia-Moreno, Jansen, Ellsberg, Heise, & Watts, 2006). In the United States, population-based estimates of lifetime physical and sexual domestic violence prevalence range from 25% to 50%, with most between 25% and 35% (Coker et al., 2002; Tjaden & Thoennes, 2000). Variations in prevalence estimates may be due to the following: (1) how domestic violence is defined and measured because some studies may focus on physical and sexual violence only (e.g., Garcia-Moreno et al., 2006) whereas others may also include psychological abuse (e.g., Bonomi et al., 2009); (2) whether lifetime (e.g., Coker et al., 2002) or past year (e.g., Thompson et al., 2006) is used as the time frame for measurement; and (3) which population or setting is used (e.g., national samples vs. shelter samples, as in Johnson, 1995). In health care settings, the prevalence rates of violence against women by an intimate partner are reported to be between 10% and 23% (Bonomi et al., 2009; Coker et al., 2002; Thompson et al., 2006). This serves as a reminder to nurses that a substantial number of women in their care could be in violent intimate relationships.

The etiology of domestic violence is complex, and there are many theoretical frameworks explaining the causes of violence in intimate relationships. For more than three decades, there have been debates about whether domestic violence is primarily perpetrated by men against women (Dobash & Dobash, 1993), or whether women are as violent as men in intimate relationships (Straus & Gelles, 1990). More recently, Johnson (1995, 2006) has proposed a typology of domestic violence to address the long-standing dispute. Central to Johnson's (2006) typological approach is the assertion that domestic violence is not a unitary phenomenon and that distinctions among the types can be made on the basis of whether violence is part of the tactics to control an intimate partner. Of the types of domestic violence proposed by Johnson (2008), situational couple violence is considered to be the result of escalation of specific conflicts and is not part of a general pattern of control over the partner. In intimate terrorism, however, violence is used as one of the many tactics to gain control over the partner. Almost always perpetrated by men, this type of systematic, controlling abuse is the kind of violence seen in emergency departments, domestic violence shelters, and the criminal justice system. Nurse researchers have long recognized the use of deliberate and repeated physical aggression and/or sexual assault, with minimal provocation, by a man against his intimate partner with the intention of exerting coercive control (Campbell, 1989; Campbell & Humphreys, 1993). Frye, Manganello, Campbell, Walton-Moss, and Wilt (2006), using a representative sample of women living in 11 North American cities, also found that a majority of the women who experienced physical assault by an intimate partner experienced controlling behaviors by that partner as well.

Women's responses to domestic violence are complex. Although learned helplessness (Walker, 1984) was used to explain women's passivity and helplessness in the face of violence in intimate relationships, contemporary theory and research tend to see abused women as resilient and resourceful survivors

(Campbell, Rose, Kub, & Nedd, 1998; Irwin, Thorne, & Varcoe, 2002). Nurse researchers have identified a variety of strategies used by abused women to resist abuse during the process of living in, and eventually leaving, an abusive relationship (Ford-Gilboe, Wuest, and Merritt-Gray, 2005; Wuest, Ford-Gilboe, Merritt-Gray, & Berman, 2003) and how abused women strategize to protect their children's safety and emotional well-being (Ulrich et al., 2006).

Research indicates that women are most at risk for homicide from an intimate partner when they leave the battering relationship (Wilson & Daly, 1993). Nurse researchers have made important contributions to this body of knowledge. The Danger Assessment was developed by Campbell (1986) to help abused women realistically appraise their risk of homicide and enhance their self-care agency and has been tested in different samples of abused women (Campbell, 1995; Campbell, Soeken, McFarlane, & Parker, 1998; McFarlane, Parker, & Soeken, 1995). In a review of the research related to intimate partner homicide, Campbell, Glass, Sharps, Laughon, and Bloom (2007) identified prior domestic violence as the major risk factor, with perpetrator gun ownership, estrangement, stepchild in the home, forced sex, threats to kill, and choking as the other risk factors.

There is overwhelming evidence that women exposed to domestic violence experience a wide range of long-term health problems. Research has shown that domestic violence is a significant risk factor for psychological and emotional health problems, including depression (Dienemann et al., 2000), substance abuse (Walton-Moss et al., 2003), and posttraumatic stress disorder (Woods, Hall, Campbell, & Angott, 2008). Abused women have a 50% to 70% increase in gynecological, central nervous system, and stress-related problems compared with nonabused women (Campbell et al., 2002). Domestic violence also increases women's risk of contracting a sexually transmitted disease (Alvarez et al., 2008; Silverman, Decker, Saggurti, Balaiah, & Raj, 2008) and cervical cancer (Coker, Hopenhayn, DeSimone, Bush, & Clifford, 2009). Even after leaving the abusive relationship, women are still at risk for long-term health problems. For example, Wuest et al. (2008) found that women who have left an abusive relationship for 20 months or longer continue to experience chronic pain.

More recently, nurse researchers have begun to explore the link between exposure to domestic violence, chronic stress, and poor overall health at the cellular level. In a study involving formerly abused and nonabused women, Humphreys et al. (2011) find that the length of telomeres (the protective components that stabilize the ends of chromosomes and modulate cellular aging) is significantly shorter among formerly abused women. In addition, they find that the length of time in an abusive relationship is associated with telomere length.

Domestic violence also has economic consequences. Health care costs are higher for abused women compared with nonabused women (Rivara et al., 2007; Snow-Jones et al., 2006; Varcoe et al., 2009). Also, more severe abuse is associated with greater use of health care services (Ford-Gilboe, Hammerton, Burnett, Wuest, & Varcoe, 2009).

Nurses can play a key role in effectively identifying domestic violence and providing follow-up referrals and supportive interventions for women experiencing domestic violence. Screening guidelines such as those developed by the Family Violence Prevention Fund (2004) for health professionals and clinical tools such as the Abuse Assessment Screen developed by the Nursing Research Consortium on Violence and Abuse (http://www.nnavwi.org) can help nurses to integrate assessment of domestic violence in their everyday practice. Increasingly, nurses have developed interventions to ensure abused women's safety and to address their complex health and social needs. For example, an empowerment intervention, that is, a brief protocol-driven nursing intervention, was developed by Parker, McFarlane, Soeken, Silva, and Reel (1999) to help abused women address the violence including danger assessment and safety planning. Supporting abused women to develop strategies for managing distressing symptoms may help them to better access supportive networks and to strengthen personal resources (Ford-Gilboe, Wuest, Varcoe, & Merritt-Gray, 2006). More interventions are emerging, including the DOVE Intervention (Sharps, Bullock, & Campbell, 2010) and the i-HEAL Intervention (Ford-Gilboe et al., 2006).

In summary, domestic violence is a serious public health problem with far-reaching health consequences. Recent progress in theory and research has led to the better understanding of the complex dynamics of domestic violence; nurses have made important contributions to the development of theories and evidence-based practice concerning violence in intimate relationships. Nursing has a unique role to play in responding to the needs of domestic violence survivors while at the same time nurses are in an excellent position to collaborate with other professionals in domestic violence prevention and intervention. Much is still to be learned about domestic violence. Nurses have the potential to enhance understanding of this complex phenomenon and to adopt a culturally competent approach to develop more comprehensive evidence-based interventions. Research that combines the study of biological measures and intervention models in survivors experiencing the stress of domestic violence is needed to inform the development of interventions to potentiate survivors' strengths and health potential. Some groups may be at additional risk for domestic violence (e.g., women with disabilities), and more research is needed to further develop and test theories of violence that are specific to such at-risk groups.

Agnes Tiwari

DRINKING AND DRIVING AMONG ADOLESCENTS

Drinking and driving is rooted in the central role that alcohol plays in American life and culture. Alcohol is commonly found at celebrations, parties, and leisure activities. In addition, advertisements on television, magazines, and billboards present messages that shine a positive light on drinking. Given this situation and despite drinking laws, adolescents drink and drive, and adolescents who have been drinking are involved in fatal crashes at twice the rate of adult drivers (National Highway Traffic Safety Administration, 2005).

In spite of decreasing rates of driving after drinking reported by high school students, the problem of riding with a driver who has been drinking has not changed in the past 2 years. In 2003 and again in 2005, almost one third of high school youth reported engaging in the risk of riding with a driver who had been drinking (Centers for Disease Control, 2005). Three teens are killed each day when they drink and drive (National Highway Traffic Safety Administration, 2005).

Although national trends in riding with a driver who has been drinking alcohol have decreased since 1991, there has been no change from 2003 to 2005 in the percentage of students who rode with a driver who had been drinking (30.2% in 2003 and 28.5% in 2005; Centers for Disease Control, 2005). Maio et al. (2005) reported that of 671 adolescents, 22% indicated they rode with a driver who had been drinking. Having access to a car increases drinking–driving and drinking in cars (Walker, Waiters, Grube, & Chen, 2005).

Passengers offer potential for breaking the link between drinking and driving. Isaac, Kennedy, and Graham (1995) reported that 5% to 10% of 10,277 drunk-driving fatalities had sober passengers who could have intervened and half of the 16- to

19-year-old drivers had a least one sober passenger in the car. Out of 16,694 alcohol-related crashes, approximately 50% of the fatalities were drunk drivers and 17% of the fatalities were passengers in the car (National Highway Traffic Safety Administration, 2005). Youth who are involved with drinking peers are more likely to ride with a drinking driver; however, riding with a drinking driver does not lead to drinking and driving (Yu & Shacket, 1999). In a study of 4,380 respondents, passengers of drinking drivers were more than eight times more likely to be 14 to 18 years of age. Persons 16 to 20 years of age consume more alcohol before driving and have one or more passengers with them when they drive after drinking compared with all other age groups (Hingson & Winter, 2003). In an observational study of 471 teen drivers on 13 roadway sites around 10 public schools, there was one or more passenger present in 239 of the cars, and youths drove faster with shorter headways than general traffic. The presence of a male passenger resulted in greater speed and shorter headways (Simons-Morton, Lerner, & Singer, 2005). Smith, Kennison, Gamble, and Loudin (2004) in a qualitative study on intervening as a passenger in drinking and driving queried 52 youths about drinking–driving situations and interventions. The findings of the study included the following drinking–driving situations: the participants were entangled with a drinking driver who was determined to drive, the participants were endangered while riding in a car with a drinking driver, and the participants were stranded because they did not get in the car with a drinking driver and had no one to turn to for a ride. Interventions described by the participants were to persuade, to interfere, to plan ahead, and to threaten.

Youth passengers offer potential for exerting influence on drinking drivers and for taking responsibility to stop a drinker from driving (Assailly, 2004). In a telephone interview with 44 adolescents who had either driven while drunk or rode with a drinking driver, Nygaard, Waiters, Grube, and Keefe (2003) found that parents, friends, and peers influence a decision to get involved in drinking–driving situations, no peer pressure to drive after drinking or to get into a car with a drinking driver was reported, and convincing drinkers not to drive is difficult. In a study on adolescents' propensity to intervene among 2,697 5th- to 12th-grade students, girls were more likely to say they would talk to a friend about drunkenness and would take a friend's keys than boys (Flanagan, Elek-Fisk, & Gallay, 2004).

Situations and locations associated with riding with a drinking driver include outdoor settings, cars, restaurants, homes of friends, and other social activities (Farrow, 1987; Gibbons, Wylie, & Echterling, 1986; Walker et al., 2005). Riding with a drinking driver is related to attitudes, peer influence, and having an accessible ride (Davey, Davey, & Obst, 2005; Gibbons, Wylie, Echterling, 1986; Grube & Voas, 1996). Factors such as accessible transportation and presence of others who disapprove of drunk driving influence drinking and driving. Among youth, there is a positive correlation between associating with drinking peers and riding with a drinking driver (Grube & Voas 1996; Labouvie & Pinsky, 2001; Yu & Shacket, 1999).

Intervention studies among youth using video media have been focused on education to avoid drinking and driving and riding with a drinking driver. Collins and Cellucci (1991) examined an alcohol education and media component among 52 11th- and 12th-grade students. Knowledge on drinking and driving improved, and there was no effect on attitudes or alcohol involvement. In a study focusing on drinking and driving prevention, Kuthy, Grap, and Henderson (1995) presented 274 adolescents with a 20-minute slide show of graphic pictures of severely injured victims of drinking–driving accidents. There was no difference in the reported driving behaviors between the immediate postprogram and a 1-month interval. A 25-minute interactive video intervention to prevent alcohol misuse was administered to 671 youth 14 to 18 years of age admitted to the emergency department for a minor injury. Using an alcohol misuse self-report measure, there was no effect for the total group; however, in a subgroup of 32 drinking drivers, alcohol misuse decreased at 3- and 12-month intervals (Maio et al., 2005). Conclusions reached on intervention programs are that curriculum is limited as a stand-alone determent of drinking and driving (Augustyn & Simons-Morton, 1995) and that in spite of school educational programs, fear of legal consequences, and knowledge of drinking–driving fatalities, students who drink and drive will continue a drinking–driving behavior (Nygaard et al., 2003). It is claimed that interventions should feature peers (Leadbeater, Foran, & Grove-White, 2008), not be preachy, and focus on the social consequences of drinking and driving rather than life-threatening consequences (DeJong & Atkin, 1995). Enhancing personal and social competence in preventive youth programs is a critical aspect influencing adolescent risky behaviors (Pinko, 2006; Smith, Atkin, & Roznowski, 2006).

It can be concluded that if youth passengers intervene and break the link between drinking and driving, there is potential for reducing drinking and driving fatalities. Studies on intervening in drinking and driving are called for to reduce harm among adolescents.

Mary Jane Smith

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Eating Disorders

There is a plethora of studies related to eating disorder with women between the ages of 13 and 25 years. Conversely, there is a paucity of these same studies with women older than 25 years. Eating disorder includes diseases such as anorexia nervosa, bulimia nervosa, overeating, and binging; however, only anorexia nervosa and bulimia are examined in relation to women older than 25 years. Because of the complexity, overlapping symptoms, and persistent nature of eating disorders, very little is understood about adult women living with this health problem. As a result, these women suffer serious mental and physical health consequences. Therefore, primary care providers need not only to be able to recognize the importance of identifying and managing the signs and symptoms of eating disorders but also be able to use anticipatory guidance strategies and intervention to prevent eating disorder among middle- to older-age adult women (Lapid et al., 2010;Marcus, Bromberger, Wei, Brown, & Kravitz, 2007; Midlarsky & Nitzburg, 2008; Mond, Myers, Crosby, Hay, & Mitchell, 2010). Hence, this entry aims to define and review the incidence and prevalence rates of eating disorders, to identify the most common physical signs and symptoms, and to describe potential intervention strategies for treating and preventing eating disorders among ethnically diverse women.

Although the appetite center is under the control of the hypothalamus, culture and environment play an integral role in an individual's attitudes toward and use of food. When women experience consistently low self-esteem, and anxiety and stress become intense and cumulative in nature, food may be used in a dysfunctional manner resulting in serious and life-threatening forms of eating disorders (Cyr, 2008).

An estimated 8 million Americans are living with some form of eating disorder; 7 million of whom are women. Only 30% to 40% of people recover from eating disorders, and of 1 in 10 people who actually receive treatment, 80% do not obtain the support needed to maintain recovery. The documented mortality rate indicates that 5% to 10% die within 10 years whereas 18% to 20% die within 20 years of being diagnosed (South Carolina Department of Mental Health, 2010). Globally, the rate of occurrence of eating disorders is rising at an alarming rate in Asia, Europe, the Middle East and many other parts of the globe (Watters, 2010). This rate, however, may be just the tip of the iceberg given the shame, stigma, and humiliation associated with this health problem (Vitale, Lotito, & Maglie, 2009). Although 95% of eating disorders occur between the ages of 12 and 25 years (South Carolina Department of Mental Health, 2010), more recently, the disorder is now being recognized in women 30 years and older (Carr & Kaplan, 2010). Historically, eating disorders were believed to only affect middle- to upper-class White women (Robert-McComb, 2001); however, recent studies (Budd, 2007; Fernandes, Crow, Thuras, & Peterson, 2010) found that eating disorders are on the rise among various racial and ethnic groups as well as different social positions.

Two of the most common presentations of eating disorders are anorexia nervosa and bulimia nervosa. One half to one percent of the U.S. population has been diagnosed with anorexia nervosa. These women usually fear obesity and see themselves as overweight even when they are not (Cyr, 2008). They have a preoccupation with eating and restrict the amount of food eaten (sometimes to the point of starvation) or regularly engage in binge eating or self-induced vomiting (Robert-McComb, 2001). Bulimia involves eating excessive amounts of food followed by multiple episodes of self-induced vomiting (Cyr, 2008) as well as the misuse of laxatives, diuretics, or enemas. Bulimia affects 1% to 3% of the U.S. population, which is most likely an underestimation (Broussard, 2005). Similarly, calorie restriction is controlled by excessive exercise. A woman may lose 50% of her ideal body weight; however, women with bulimia already tend to be below, at, or exceed ideal body weight. Complications include dehydration, fluid and electrolyte imbalance, renal failure, metabolic acidosis, arrhythmias, sudden death, endocrine abnormalities, and neurological dysfunction (Robert-McComb, 2001).

Anorexia nervosa was first recognized as a disorder in the nineteenth century and was thought to be on the rise in the twentieth century. Treatment consisted of neuroleptics in the 1950s and 1960s and later shifted to individual psychotherapy. In the 1970s, family therapy was emphasized, and by the late twentieth century, medications were used as an adjunct to psychotherapy (Steinhausen, 2002).

The cost of treating an eating disorder in the United States ranges from $500 to $2,000 per day. Many patients require in-patient treatment for at least 3 to 6 months costing $30,000 per month or $90,000 to $180,000 for the total length of stay (Agras, 2001). Unfortunately, many insurance companies do not cover the cost of treating eating disorders (South Carolina Department of Mental Health, 2010).

Eating disorders are closely connected with impaired psychosocial functioning, but less than 40% of those suffering from these disorders have obtained treatment from a health care provider. Of the 80% who did seek treatment for anxiety or depression, only one third were asked if they suffered from an eating disorder; however, if questioned, half of the women reported they would not disclose their eating disorder to the health care provider (Mond et al., 2010). Substance abuse is closely aligned to eating disorders, and 18% of older women with eating disorders admit to a substance abuse problem (Carr & Kaplan, 2010). Detection of eating disorders is difficult in that it tends to be hidden by the patient, but compounding this problem is that nurses and other health professionals often lack the knowledge and insight necessary to detect and treat eating disorders (Mond et al., 2010).

When an eating disorder is detected, health care providers must identify concerns regarding follow-up intervention particularly in the 25% of older women who do not respond to current therapies for reasons yet unknown (Carr & Kaplan, 2010). Problematic is the disconnect in perceived recovery from eating disorders between the medical perspective and that of the patient. Medical recovery has been based on the patient's decreased obsession with body weight, return of a regular menstrual cycle, and weight maintenance. Patients, however, describe recovery as developing a sense of control over their lives and of achieving a renewed sense of self (Patching & Lawler, 2009). Therefore, not only is there a need for consensus about what constitutes recovery but also for innovative approaches to treatment as well as tailored protocols (Johnston, Fornai, Cabrini, & Kendrick, 2007). Future research needs to focus on exploring and understanding these disorders from the women's standpoint rather than placing these women into a predetermined medical treatment template which tend to be unsuccessful (Patching & Lawler, 2009).

Women living with eating disorders feel isolated and ashamed and are not able to effectively verbalize their difficulties. One approach that addresses these feelings is to increase allocation of funding directed toward the development of support and self-help groups for all women suffering from eating disorders. The formation of gender responsive support groups has the potential to alleviate feelings of shame and isolation (Rortveit, Astrom, & Severinsson, 2009). Efforts should focus not only on recognition and treatment of eating disorders but also toward their prevention (Patching & Lawler, 2009). A more comprehensive understanding into the role of media influence and its relation to eating disorders requires further investigation (Vitale et al., 2009). Future research efforts also need to determine why some women perceive bulimia as normal behavior and therefore do not seek medical attention (Broussard, 2005).

Strategies aimed at encouraging patients to seek treatment and engage them as active participants in their own care are crucial (Kreipe & Yussman, 2003). Critical to this process is the nature and quality of relationship between the woman and her health care provider. More specifically, the health care provider's attitude and approach has been found to have a positive influence on successful treatment (Geller, Brown, Zaitsoff, Goodrich, & Hastings, 2003). The health care provider should be open to conducting physical and mental health assessments and family history that include questions related to perception of self-esteem, perception of ideal and real body image, and most importantly a family or personal history of disordered eating. The information generated from the assessment and family history should be used to tailor a plan of care.

As evidenced by the documented incidence, prevalence, and mortality rates, disordered eating is not decreasing but rather is steadily increasing across gender, age, ethnic background, and social positions. The rising cost and the conflicting evidence regarding curative approaches mandates the following: An anticipatory and preventive approach must be considered; primary health care provider's knowledge and skills related to understanding, recognizing, and treating disordered eating need to be enhanced; and a deeper understanding of cultural and social systems is necessary to gain a broader and more inclusive perspective of eating disorders (Patching & Lawler, 2009) particularly in light of their rampant globalization (Watters, 2010). And finally, future research should examine disordered eating from a life span approach, which is a vital next step toward the prevention, detection, and early treatment of eating disorders (Dichter, Cohen, & Connolly, 2002; Patrick & Stahl, 2009).

Deborah B. Fahs
Barbara J. Guthrie

ELDER MISTREATMENT

Elder mistreatment (EM) is a complex syndrome that can lead to morbid or even fatal outcomes for those afflicted. *Mistreatment* is the term used to describe outcomes from such actions as abuse, neglect, exploitation, and abandonment of the elderly, and it affects all socioeconomic, cultural, ethnic, and religious groups. Prevalence estimates range between 3.2% and 27.5% in general population studies (Cooper, Selwood, & Livingston, 2009). A recent data reported from a national sample of community-residing adults older than 60 years using a representative sample and random-digit dialing indicated that 11.4% of older adults report some form of EM (Acierno et al., 2010). The national Elder Abuse Incidence Study, the only incidence study, documented over 500,000 new cases annually (Tatara, 1993).

The National Research Council (NRC, 2003) convened an expert panel to review prevalence and risk for elder abuse and neglect and concluded that EM is an intentional action that causes harm or creates a serious risk of harm (whether or not the harm is intended) to an at-risk elder by a caregiver or other person who stands in a trusting relationship to the elder, or EM is the failure by a caregiver to satisfy the elder's basic needs or to protect the elder from harm. There are several types of EM described in the NRC report. *Abuse* is generally understood as physical assault inflicted on an older adult resulting in harmful effects. Abusive behavior may include hitting, kicking, punching, and other physical contact. *Neglect* is the refusal or failure to fulfill any part of a caregiver's obligations or duties to an older adult. Neglect may be intentional or unintentional. Self-neglect occurs when an older adult either knowingly or unknowingly lives in such a manner that is deleterious to his or her health. *Exploitation* is fraudulent activity in connection with an older adult's property or assets, and *abandonment* is defined as the deliberate or abrupt withdrawal of services in caring for an older adult. Self-neglect has received a great deal of recent attention given its deleterious outcomes on the older person and the opportunity to intervene (Dong et al., 2009; Mosqueda et al., 2008; Poythress, Burnett, Naik, Pickens, & Dyer, 2006). Further, resident-to-resident EM in long-term care settings is an important syndrome that nurses need to understand (Rosen et al., 2008). Evidence suggests that only 1 in 14 EM cases is reported to some public agency. Nurses can do much to help in the screening and detection process of EM by doing a careful history and physical assessment with attention to the subjective complaint of EM, along with any signs or symptoms of the same. Underreporting of EM is a serious concern because older adults may have disease symptoms or age-related changes that imitate or conceal mistreatment symptoms, making the assessment process complex. Few clinicians have been trained in EM assessment and intervention, which has also led to underreporting. With an unprecedented number of individuals living beyond the age of 65 years and even beyond the age of 85 years, nurses must be sensitive to the possibility of EM.

Theories for EM causality have been posited. The dependency theory refers to the amount of care an elder person requires and is related to stressed caregiver research, which describes overwhelmed caregivers who lose their control or stop providing reasonable care. Conversely, there are data that reflect the caregiver's dependency on the elder (for shelter, money, etc.), which puts the elder at risk. Transgenerational violence theory refers to children who learn violent behavior as normal and then become violent and abusive as they grow older. This might be viewed from a learning theory perspective, although some have looked at it as a retribution act; an adult child may strike back at a parent or a caregiver who was once abusive. The psychopathology of the abuser theory refers to any nonnormal caregiver, such as substance abusers (alcohol, drugs), psychiatrically impaired individuals, or mentally retarded caregivers. The number of mentally retarded elders older than 65 years has grown substantially over the past decade, creating situations where mentally retarded or disabled offspring become caregivers for very elderly parents (NRC, 2003).

Early studies looked at the prevalence of EM from a variety of perspectives: acute care, community nursing care, and nursing home setting. Differences in operational definitions and methodological approaches and the lack of national prevalence studies have made it difficult to understand the conditions under which EM is likely to occur. Although EM education and training has improved, there is still a great need for more systematic nursing assessment, care planning, and follow-up with the older adult. The need for researchers who can contribute to this area of inquiry is great.

There is no Denver Developmental screen for older adults that enables clinician to understand what an 80-year-old looks like and what conditions are likely to represent EM. The signs and symptoms of EM might include unexplained bruises, fractures, burns, poor hydration, reports of hitting or any other violent behavior against the older adult, sexually transmitted disease in institutionalized older adults, unexplained loss of money or goods, evidence of fearfulness around a caregiver, or subjective report of abuse. It is especially difficult to evaluate the demented older adult for EM; a careful and thorough interdisciplinary team approach is required. The American Medical Association's (1992) *Diagnostic and Treatment Guidelines on Elder Abuse and Neglect*, although more than 15 years old, provides excellent guidelines for the assessment of EM, along with flowcharts for assessing and intervening in cases. A summary of approaches for screening and assessment of EM suggests a comprehensive and highly methodical approach using accepted screening instruments (Fulmer, 2008). Special attention must be given to an older adult who has diminished or absent decision-making capacity. Dementia has been documented as a risk factor for EM and should automatically trigger EM assessment. Cognitive status can only be determined by rigorous clinical testing and use of validated instruments. Some have suggested a two-step process to assess capacity for elders suspected of self-neglect. The steps include cognitive evaluation to determine the elders' decision-making ability using a traditional medical examination along with standardized tests such as the Executive Interview, the Financial Capacity Instrument, the Mini-Mental State Examination, and the Geriatric Depression Scale, followed by an assessment of the elders' executive ability to live independently in the community through review of reports by nurse practitioners, social service professionals, occupational therapists, and physical therapists (Naik, Lai, Kunik, & Dyer, 2008).

Overzealous protection of a competent elder is a form of ageism that infantilizes the older individual and takes away their autonomy. Each state has EM reporting laws or requirements that professionals should be familiar with. Interdisciplinary care teams are especially important in the EM assessment process. Each team member is able to use their own expertise to the benefit of older adults. A key practice implication for EM is the inclusion of family violence questions in every history with attention to and documentation of any signs and symptoms of EM.

Terry Fulmer
Sarah Pernikoff

ELECTRONIC NETWORK

In general, a network is composed of a minimum of two connected points. For example, one person talking with another, face to face, can constitute a network. Telephone networks connect at least two people using transceivers, wire, switches, and computers. Television networks connect large numbers of people. An electronic network is considered to be the connection, or linking, of two or more computers to allow data and information exchange. Electronic computer networks may be as small as two computers or as large as the Internet, considered to be a network of networks.

The goal of networks is information exchange and may or may not be bidirectional. Person-to-person conversations, even if using some sort of intermediary like the telephone or computer, are usually bidirectional. Television and some computer network applications may be unidirectional; however, bidirectional computer networks are the most common. Examples include local area networks, which may serve a department, larger networks called wide area networks, and the Internet. Intranets, which are the internal deployment of Internet technologies, are commonly found in business and other environments requiring information exchange among a department or other limited amount of people.

Electronic networks continue to be exciting tools for nursing, continuing to increase in importance for information acquisition and dispersion. Electronic networks, such as the Internet and the World Wide Web, provide a means of communicating as well as facilitating collaborative research, promoting education regardless of geographic limitations, allowing access and acquisition of needed resources, and providing a medium for social engagement. Electronic networks continue to impact areas integral to nursing, such as lifetime electronic health record, nursing research, increased interdisciplinary collaborative research, online education for patients and nurses, nursing knowledge acquisition and information exchange, and patient care.

Although the essence of nursing has been a network, that is, the nurse–patient relationship, there is limited nursing research on electronic networks. Early work by Brennan, Moore, and Smyth (1991) and Ripich, Moore, and Brennan (1992) investigated the use of electronic net works to facilitate nursing support of home care clients and their caregivers. They concluded that a computer network is an excellent tool to facilitate support and information exchange among caregivers and between nurses and caregivers for patients with AIDS and Alzheimer's disease. This type of support mechanism has grown to other areas of health care requiring nursing intervention such as patients' seeking health information (Dickerson et al., 2004).

There are anecdotal reports and case studies to support nurses' use of electronic networks. Sparks (1993) has been instrumental in her advocacy and promotion of electronic networks and resource availability for nurses (e.g., the Educational Technology Network, which promoted the exchange of information and ideas for nurses, nurse educators, and nursing students and was the first international electronic network managed by a nurse). Other early work included Barnsteiner's (1993) and Graves's (1993) work with nursing resource availability (Online Journal of Nursing Knowledge Synthesis and the Virginia Henderson STTI Electronic Library, respectively) and DuBois and Rizzolo's (1994) work in the *American Journal of Nursing's* network. More up-to-date examples, with limited research, include the use of social media (Twitter, Facebook, and other similar Web 2.0 examples) providing a more "immediate" digital connection for nurses and patients.

As information technology increases in use and health care requires increased efficiency, nurses will rely more and more on information technology as one tool for providing the best possible patient care. Local electronic networks, such as clinical information systems, will include other larger networks so nurses will have the best information resources to assist nursing care. Research concerning the effects of electronic networking (using Web 2.0 tools) on nurses and other health care professionals as well as on patients and their families continues to be needed. Electronic networking should be examined as an independent variable through the inclusion of electronic networks in all stages of the research process. This research will promote the advancement of health and patient care by providing the scientific foundation for the appropriate application of digital networking technologies.

W. Scott Erdley
Susan M. Sparks

EMERGENCY NURSING

As a specialty within the nursing profession, emergency nursing encompasses care of individuals across the life span, seeking help for perceived or actual physical or emotional alterations of health that require emergent or nonemergent interventions (Emergency Nurses Association [ENA], n.d.-e). Emergency nurses have a specialized field of practice and unique knowledge and skills in emergency care that interface with patients during critical moments. This unique set of knowledge and skills ensures the public that emergency nurses are competent caregivers who are accountable for the care they deliver, responsible, and able to communicate and act with autonomy while at the same time able to work in a collaborative relationship with others (ENA, n.d.-e). It is through emergency nursing research that emergency nurses are able to be responsive to changes in health care in order to deliver state of the art care to this very important group of patients and their families.

Because emergency patients often come to the emergency department (ED) with conditions that pose a threat to life and limb or have a significant risk of morbidity or mortality, competent emergency nursing practice is a unique combination of rapid triage and assessment of life-threatening problems, simultaneous prioritization of care, and effective and efficient implementation of the appropriate interventions (ENA, n.d.-e). With the increasingly complex diagnostic and management strategies available, emphasis on resource-efficient patient care requires research strategies that maximize quality care while also controlling resources.

Not all patients come to the ED for life-threatening conditions. It is often through the ED that patients access the tertiary health care system. Therefore, emergency nurses are often the first health care practitioners who foster entry into the health care system for the general population.

Patients often come to the ED because it is the only access they have for health care and require primary care services during their ED visit (Delgado et al., 2010). Emergency nurses are required to have knowledge about the care and treatment of patients seeking primary care and health promotion services. They need to be aware of social and community services and must have the ability to collaborate effectively with prehospital and in-hospital care providers.

Emergency nurses provide care to persons of all ages, across all levels of the health/illness trajectory, and work in an environment that is complex and unpredictable (ENA, n.d.-e). For this reason, the research agenda for emergency nurses is robust.

Data from the 2007 National Hospital Ambulatory Medical Care Survey show that in 2007 there were 116.8 million visits to hospital EDs or 39.4 visits per 100 persons (Niska, Bhuiya, & Xu, 2010). In that same study, 12.5% of ED patients were admitted to the hospital and approximately 39 million of the visits were injury related. In a study of workforce in emergency care, Counselman et al. (2009) found that EDs' annual volumes have increased by 49% since 1997, with a mean ED volume of 32,281 in 2007. The average reported ED length of stay is 158 minutes from registration to discharge and 208 minutes from registration to admission. As a result of this surge of ED visits, many EDs across the nation do not have the capacity to serve the volume of patients that come for treatment. EDs spent an average of 49 hours per month diverting ambulances to other EDs in 2007. Boarding or holding patients for extended length of time waiting for a hospital bed to open is common practice, with an average of 318 hours of patient boarding per month (Counselman et al., 2009).

The 2008 National Sample Survey of Registered Nurses conducted by the U.S. Department of Health and Services (Health Resources and Services Administration, 2010) found that approximately 218,339 registered nurses were employed in an emergency setting in 2008, a significant increase from approximately 117,514 in 2004 (Health Resources and Services Administration, 2006). Emergency nurses enter ED practice with a broad range of educational preparation. A study by Counselman et al. (2009) found that many emergency nurses (46%) have an associate degree as their highest level of education, 28% have a BSN, and 3% have a graduate degree (MSN or higher).

The advanced professional nursing roles in the ED include nurse administrators, clinical nurse specialists, and nurse practitioners. The educational preparation for advanced practice nurses requires graduate education and certification. The ENA (2009) has delineated scope and standards of care for emergency nurses and includes a document on advanced practice nurses in emergency care.

Emergency nurses are accountable for the care they provide to patients. This accountability requires certification. Emergency nurses can receive certification in emergency nursing (Certified Emergency Nurse), flight nursing (Certified Flight Registered Nurse), pediatric emergency nursing (Certified Pediatric Emergency Nurse), or critical care ground transport nursing (Certified Transport Registered Nurse) offered by the Board of Certification for Emergency Nursing (n.d.) in collaboration with other entities. Currently, more than 23,000 nurses are certified by Board of Certification for Emergency Nursing (n.d.).

Established in 1970, the ENA is the primary organization for emergency nurses in the United States. The mission of ENA is to advocate for patient safety and excellence in emergency nursing practice (ENA, n.d.-b) with approximately 37,000 members. ENA offers education programs and courses to meet the needs of emergency nurses around the world. These programs include review courses for certification as an emergency nurse, the Certified Emergency Nurse. Other review courses offered by the ENA include Trauma Nursing Core Course, Emergency Nursing Pediatric Course, Course in Advanced Trauma Nursing, and Geriatric Emergency Nursing Education. Additional example programs/courses include triage, orientation, educator references for professional and patient education, age-specific program, family-focused programs, conducting research and grant writing, and courses that cross the life span for injury prevention (ENA, n.d.-a).

To expand research efforts in emergency nursing, ENA took the lead by initiating an Institute for Emergency Nursing Research Committee and in 2009 transitioned this committee to an Institute for Emergency Nursing Research. The mission of the institute is to conduct and facilitate research to support evidence-based practices for emergency nursing and emergency care (ENA, n.d.-c). The specific goals include the following: (1) to develop a culture of research to advance emergency nursing and emergency care by promoting knowledge generation, knowledge application, and knowledge transfer; (2) to facilitate the development of researchers in emergency nursing through education, mentoring, networking, and collaborative research opportunities; (3) to set research priorities for the discipline of emergency nursing; (4) to enhance collaboration among researchers within ENA and counterparts in the public and private sectors; and (5) to facilitate the generation of evidence-based emergency nursing resources (ENA, n.d.-c).

To provide a focus for ED nurse researchers, the institute developed research priorities for the field of emergency nursing. Research priorities include investigations that address the generation, dissemination, and translation of research related to three broad areas: (1) the clinical priorities identified by ENA—crowding/boarding, psychiatric emergency patient care, and workplace violence; (2) the emergency nursing professional practice issues—examples of research areas include nurse orientation, continuing education, and assurance of competence of emergency nursing practices as well as ED staffing patterns and the impact of the staffing on patient outcomes; and (3) the Joint Commission's National Patient Safety Goals—examples of research areas include improving the accuracy of patient identification, the effectiveness of communication among caregivers, the safety of using medications, and the recognition and response to changes in a patient's condition as well as reducing the risk of health care–associated infections, patient harm resulting from falls, influenza and pneumococcal disease, and health care–associated pressure ulcers (ENA, n.d.-c).

A review of research publications and presentations including posters displayed at the most recent annual conference of ENA can give an overview of topics of interest in emergency nursing research. Much research is generated in response to practice issues (Li, Juarez, & Gates, 2010; Schumacher, Gleason, Holloman, & McLeod, 2010; Tanabe, Gisondi, Barnard, Lucenti, & Cameron, 2009). Additional research areas include competency delineation (Hoyt et al., 2010), pediatric emergency care (Qazi, Altamimi, Tamim, & Serrano, 2010), forensic nursing (MacLean, Desy, Juarez, Perhats, & Gacki-Smith, 2006), emergency education (Jackson, 2010), ED technology, injury prevention (Désy, Howard, Perhats, & Li, 2010), emergency management and preparedness (Lenaghan, Smith, & Gangahar, 2006), and geriatric emergencies (Roethler, Adelman, & Parsons, 2011).

The ENA Foundation (n.d.) is the primary source of funding for emergency nursing research. The foundation offers research grants and awards to advance the specialized practice of emergency nursing and/or to facilitate collaborative research between nurses and physicians. Partnering with other entities, the foundation offers three research programs: Emergency Medicine Foundation/ENA Foundation Team Research Grant, ENA Foundation/Sigma Theta Tau International Research Grant, and ENA Foundation Industry-Supported Research Grant. Examples of recently funded research grants include using electronic medical record reminders to improve triage protocol compliance: "Understanding Why Emergency Department Healthcare Providers Do Not Screen for Family Violence," "The relationship of leadership style and horizontal violence in emergency department staff nurse retention," and "Stress and Resilience in Emergency Nurses Following Trauma Care" (ENA Foundation, n.d.).

Research findings in emergency nursing are published primarily in the *Journal of Emergency Nursing* (*JEN*), the *Journal of Trauma Nursing* (*JTN*), the *Advanced Emergency Nursing Journal*, and the *Accident and Emergency Nursing*. Published since 1975, *JEN* is the official journal of ENA (n.d.-d). It is a peer-reviewed, bimonthly journal offering original research and clinical articles on the clinical, professional, political, administrative, and educational aspects of emergency nursing. On the basis of an examination of all issues from 2005 to October 2010, *JEN* published a total of 90 original research articles. There is a steady increase in the number of original research articles published in this journal each year.

JTN is the official journal of the Society of Trauma Nurses (n.d.). *JTN*'s mission is to provide original, peer-reviewed articles and information that reflect the practice of trauma nursing in the areas of clinical practice, education, health policy and administration, and research. *JTN* is intended for nursing professionals and all health care providers involved in trauma care, from first responder through rehabilitation.

The *Advanced Emergency Nursing Journal* is the peer-reviewed journal for advanced practice nurses. This journal is published four times a year and focuses on research that deals with evidence-based practice.

Accident and Emergency Nursing, the official journal of the Emergency Nurses' Association of Australia, is published quarterly (Elsevier, n.d.). It is a peer-reviewed journal that caters to all levels of staff working in emergency settings throughout the world. The journal aims at promoting excellence through dissemination of high-quality research findings, specialist knowledge, and discussion of professional issues that reflect the diversity of this field. In additional to these three journals, original research articles on emergency nursing can also be found in other general medical and nursing journals including cardiology and pediatrics journals.

Journals focusing on ED nursing have become increasingly involved in partnering with nurse researchers to help disseminate research for the utilization of this specialized knowledge by health care providers at the bedside. Emergency nurses also work collaboratively with others to establish evidence-based emergency nursing resources for practice. Emergency nursing research will continue increase and provide the basis for emergency nursing practice.

Emergency nurses take the lead in treating life-threatening and potential or perceived life-threatening conditions that face millions of patients across the nation. They are also prepared to deliver primary care and health promotion services as well as treating urgent care conditions. In addition, emergency nurses treat patients across the life span from the neonate to the frail elderly. Emergency nursing is a complex profession that encompasses a research trajectory that is versatile, rapidly changing, and rigorous. Research in emergency nursing is growing and expanding in an effort to respond to the dynamic practice of ED nurses.

Suling Li
Vicki Keough

EMPATHY

Empathy is a dimension of nursing that is central to caring competence, and it is often seen as an essential condition of nursing care. Empathy is often designated as the art of nursing. Empathy in nursing is the ability of nurses to penetrate the covert thoughts and feelings of the client, to accurately interpret the client's thoughts and feelings as if they were their own, and to verbally and nonverbally convey that interpretation back to the client in forming a positive nurse–client relationship. Empathy, appropriately expressed in the form of sincerity, genuine positive regard, and sensitive understanding of the client's private world, has healing potential. Empathic nursing care has been shown to improve physiological and psychological outcomes for clients. Empathy seems to create an interpersonal quality that enables individuals to release defensiveness and enhance health (Burhans & Alligood, 2010; Hope-Stone & Mills, 2001; Mercer & Reynolds, 2002).

Carl Rogers (1957) believed that empathy is the ability to "sense the client's private world as if it were your own" (p. 4) and the ability to perceive the internal frame of reference of another with such exactness as to be one with the other person's frame of reference (Rogers, 1961). Carper (1978) correlated empathy with aesthetic knowing in her description of fundamental patterns of knowing in nursing.

From a historical perspective, the roots of morality are found in empathy. Being able to empathize with potential victims encourages people to act and help others. Empathy underlies many facets of moral judgment and action. An instance when empathy leads to moral action is when a bystander is moved to intervene on behalf of a victim; the more empathy a bystander feels for the victim, the more likely it is that the bystander will intervene (Goldman, 1998). The level of empathy felt toward another will shape one's moral judgments and empathic attitudes. Putting oneself in another's place leads people to follow certain moral principles.

Developmentally, there is a natural progression of empathy from infancy onward. At 1 year, children feel distress and will start to cry when they see another child cry. After 1 year, the child will try to sooth another child that is crying. The most advanced level of empathy emerges in late childhood when children begin to feel empathy for the plight of an entire group, such as the poor or the oppressed. During adolescence, empathic understanding can reinforce moral convictions developed earlier in life that center on a desire to alleviate misfortune and injustice (Goldman, 1998).

Many recent studies have explored the biological basis of empathy. Greimel et al. (2010) explored developmental changes in the neural mechanisms underlying empathy. Schulte-Ruther, Markowitsch, Fink, and Piefke (2007) significantly correlated neural activity with empathic abilities. Vollm et al. (2006) conducted a study confirming that Theory of Mind and empathy stimuli are associated with neuronal networks. Hurlemann et al. (2010) provided the first demonstration that oxytocin can "facilitate amygdala-dependant, socially reinforced learning and emotional empathy in men" (p. 4999).

Early nursing research conducted in the area of empathy indicated that empathy development programs had little to no effect on enhancing empathy. However, later studies have indicated that empathy can be significantly improved and successfully taught and that nurse educators can enhance basic empathy among nursing students.

Teherani, Hauer, and O'Sullivan (2008) used standardized patient simulations to assess learners' empathic behaviors and discovered methods to enhance learner deficits in empathic responses. Vanlaere, Coucke, and Gastmans (2010) conducted empathy sessions in simulation laboratories with the aim of generating empathy in care providers and student nurses. The participant experiences lead to insight into their own perceptions and promoted ethical reflection. Simulation of empathy sessions "can elicit a break from conformist thinking and treatment, [initiate] a readjustment of one's own visions, and often [stimulate] an adjustment of behavior" (p. 335). Webster (2010) used a creative reflective teaching strategy in an attempt to enhance empathy in nursing students. Results of this study suggested that creative reflective experience facilitated the development of the nursing student–client relationship and promoted empathy. Idczak (2007) used hermeneutic phenomenology to investigate how nursing students learn the art and science of nursing. She concluded that empathy development is improved over time and that self-reflection and experience enhanced empathic care.

Mercer and Reynolds (2002) described a variety of assessment and feedback techniques used in the delivery of holistic consultations and concluded that empathy improved client outcomes. They also found that empathic responses were improved in students by the use of experiential teaching methods. Evans, Wilt, Alligood, and O'Neil (1998) addressed empathy as a multidimensional phenomenon and stressed the importance of understanding two types of empathy: basic and trained. They likened basic empathy to natural, raw, or ordinary feelings for others such as the innate tendency of a child to cry when recognizing distress in another human. They likened trained empathy to increased empathy as a result of knowledge and education. They used the Layton Empathy Test and the Hogan Empathy Scale to measure trained and basic empathy in 106 nursing students and found that trained empathy was not sustained over time, causing the researchers to call into question attempts by nursing faculties to teach empathy to students. They emphasized the importance of obtaining a measurement of students' baseline empathy as a way of monitoring changes in basic empathy after exposure to various empathy learning modalities. Evans et al. (1998) suggested new approaches to facilitate students' discovery of their basic empathy and emphasized that basic empathy can be identified, reinforced, and refined to develop expertise in the expression of empathy.

Oz (2001) conducted a quasi-experimental investigation of empathy with 260 nurses who were randomly assigned to intervention and control groups. They used Dokmen's Scale of Empathic Skills and the Empathic Tendency Scale to measure empathic communication skills and empathic tendency levels. Their intervention consisted of education about empathic communication. Results indicated that nurses gained empathic communication skills as a result of empathy training

Wikstrom (2001) investigated the effect of an intervention program on student nurses engagement in learning about empathy. The investigator assigned subjects to intervention and control groups. The intervention group received empathy exercises involving the use of a reproduction of Edvard Munch's painting, *The Sick Girl*, to stimulate discussion and account making regarding interpretations of empathy depicted in the painting. There was a significant improvement in the intervention group members' levels of empathy as compared with the matched control group. The research findings supported the use of art as a complementary strategy to theoretical knowledge on empathy to stimulate nurses' basic empathy.

Continued research into the biological basis for empathy is certainly on the horizon. Development of tools that more accurately measure empathy is required. Simulation laboratories in nursing education are a fitting venue for continued investigation. Research into the development of scenarios that have been shown to enhance empathy is necessary. Research focused on interventions that facilitate emotional development and allow students and caregivers to develop empathic capability and self-awareness is needed. More research is indicated in the areas of clients' perception of empathy.

Over the past 40 years, empathy has been conceptually and empirically advanced in the nursing literature. Studies have raised critical questions about the nature of empathy and how empathy may or may not be teachable using various educational and experiential strategies. Research findings suggest that baseline measurements of empathy in nurses and nursing students can be a starting point for developing strategies to enhance empathic response to clients. Nursing as a profession needs more replication of studies to identify basic empathy skills and to discern the differential impact of empathy education versus empathy education combined with experiential exercises in empathic understanding such as simulation, reflective insight, art, film, music, and literature. With continued research and growth in our understanding of empathy, the art of nursing can be enhanced and improved outcomes for clients will be achieved.

Dianna Hutto Douglas

END-OF-LIFE PLANNING AND CHOICES

The decision to choose or appoint another to make health care and end-of-life (EOL) treatment decisions for one in the event of temporary or permanent loss of decision-making capacity is less risky and requires less cognitive capacity than the creation of a list of treatments desired and not desired at some point in the future. There is no "gold standard" to assess decisional capacity; mental status assessment tests cannot be the sole criterion. Decision making is retained in early dementia, especially insofar as appointing a trusted other to make health care decisions for one's self (Kim & Karlawish, 2002). Using the technique of paraphrased recall and reflection, Mezey, Tersei, Ramsey, Mitty, and Bobrowitz (2002) developed a set of guidelines to determine if nursing home (NH) residents had the capacity sufficient to create a Durable Power of Attorney for Health Care (i.e., a Health Care Proxy [HCP]). Analysis indicated that many mild cognitively impaired residents had this capacity. Mezey et al. suggest that the guidelines are more predictive than the Mini Mental State Examination in identifying such residents and could be used for determining decision-making capacity sufficient to create an HCP.

Nurses lack confidence in assisting people make decisions about care preferences at the EOL (Jezewski et al., 2005). Education of health care professionals can make a difference in advance direction (AD) completion rates (Gutheil & Heyman, 2005; Patel, Sinuff, & Cook, 2004).

Myths about EOL care become barriers to care at the EOL. Such myths include beliefs that advance care planning (ACP) is the same as permission for euthanasia (Jeong, Higgins, & McMillan, 2007; Silviera, DiPiero, Gerrity, & Feudtner, 2000), that life-sustaining treatment (LST) at the EOL cannot be withheld in the absence of evidence that that would have been the patient's wish, that withdrawing or withholding artificial nutrition and hydration (ANH) at the EOL from a terminally ill or permanently unconscious patient is illegal, and that terminal sedation is illegal even in the presence of intractable pain and suffering of a patient who is imminently dying (Meisel, Snyder, & Quill, 2000; Sabatino, n.d.).

The most important factors for patients and families at the EOL in all care settings are pain and symptom management, information about choices, preparation for death, having a sense of completion, and being treated as a whole person that includes discussion about treatment preferences (Hawkins, Ditto, Danks, & Smucker, 2005; Heyland et al., 2006; Steinhauser et al., 2000). Many community-dwelling older adults and their families are unaware of EOL care options, unable to differentiate between (physician) assisted suicide and euthanasia, misunderstand the "double effect" in pain management, and do not understand treatment refusal or treatment withdrawal (Silviera et al., 2000). Staff and family in NHs and assisted living settings differ regarding the kind and quality of EOL care that is, or should be, provided in these settings (Cartwright, 2002). Information about ACP is not coming from physicians and other health care professionals (or the media) but rather from personal experience with illness and death (Kahana, Dan, Kahana, & Kercher, 2004; Lambert, McColl, Gilbert, & Wong, 2005).

Factors that facilitate ACP by persons with dementia include previous discussion of EOL treatment preferences with family or significant other and knowing what friends have gone through regarding EOL decision making (Hirschman, Kapo, & Karlawish, 2008). Family members (i.e., surrogate decision makers [SDMs]) of persons with moderate/severe dementia, asked to make EOL treatment decisions, are unclear about the goals of EOL, the dying trajectory likely for their loved one, and the lack information about palliative care and comfort options (Forbes, Bern-Klug, & Gessert, 2002). Their decisions to withhold ANH are more influenced by the interdisciplinary team, the resident's presumed quality of life, the stage of illness, and the comorbidities than by the AD instructions (Lopez, Amella, Strumpf, Teno, & Mitchell, 2010; The, Pasman, Onwuteaka-Philipsen, Ribbe, & van der Wal, 2002). Residents with advanced dementia are likely to have a feeding tube (FT) inserted if they do not have do not resuscitate (DNR) order, and/or there is no nurse practitioner or physician assistant on the NH staff (Mitchell, Teno, Roy, Kabumoto, & Mor, 2003). In NHs with low use of FTs—in comparison with high-use NHs—hand feeding is highly valued, the NH has a "home-like" environment that recognizes the importance of food in daily life and an ACP process that includes family participation and palliative care options (Lopez et al., 2010). High-use NHs have insufficient assistive staff at meal times and fear both aspiration and noncompliance with regulations (in regard to weight loss). Among hospitalized NH residents, lowest FT use was associated with White as compared with Black patients and those with an AD, DNR order, and no ANH orders (Teno et al., 2010).

Although the most common reason for approving insertion of a FT was that it would prolong life and prevent aspiration, only 40% of SDMs felt that it would improve the patient's quality of life (Mitchell, Berkowitz, Lawson, & Lipsitz, 2000). Most SDMs felt they understood the benefits of a FT but not the risks (83.0% vs. 48.9%), and less than half felt that the patient would have wanted tube feeding.

Ethnic, religious, and racial groups (considered homogeneously) differ with regard to EOL care and LST preferences and the context in, and process by which, such decisions are made (Cox et al., 2006; Hopp & Duffy, 2000; Kwak & Haley, 2005; Mezey, Leitman, Mitty, Bottrell, & Ramsey, 2000). Close-knit families of all ethnic groups feel that ADs are destructive to family cohesiveness and find it unbelievable that there is a law that creates a barrier to family decision making (Mitty, 2001). Cultures differ as well with regard to truth telling and disclosure (Kagawa-Singer & Blackhall, 2001). Asian and Hispanic/Latino patients prefer family participation in decision making in contrast to White and Black patients who prefer patient-centered or patient-directed decision making (Kwak & Haley, 2005). As many have shown, White patients are more informed about, interested in, and likely to discuss treatment preference, execute a living will (LW), refuse certain LSTs, and appoint an HCP than Black or Hispanic/Latino patients (Hopp & Duffy, 2000; Kwak & Haley, 2005). White patients with higher education and income levels are more likely to complete an AD than Black and Hispanic/Latino patients with less than a high school education and low income levels (Mezey et al., 2000). In comparison with Mexican American and Euro-Americans, Black patients are more likely to want LST to prolong life (Hopp & Duffy, 2000) and believe that having an AD legalizes denial of access to care (Perkins, Geppert, Gonzales, Cortez, & Hazuda, 2002). Same-race peer mentors had a positive effect on ACP among Black but not White patients with regard to AD completions (Perry et al., 2005).

Black more than White family members report communication problems regarding being informed and supported for what the family says are the patient's treatment wishes or are stated in the patient's AD (Welch, Teno, & Mor, 2005). Overall, having an AD means that families are informed about what to expect and have good communication with the physician, and patients have greater use of hospice in comparison with patients without an AD (Teno, Grunier, Schwartz, Nanda, & Wetle, 2007).

Preferences for LSTs among older adults are not consistent over time and appear to be associated with transient factors, such as current health status, rather than core values (Fried, O'Leary, Van Ness, & Fraenkel, 2007). As new health states emerge, what was once intolerable and unacceptable (such as mild chronic pain and transient weakness) becomes tolerable and acceptable, hence the instability of choices. Variability was somewhat associated with treatment burden or the risk of a (further) impaired health status.

Hospitalized older adults (>60 years) with LWs that indicated wishes for limited care or comfort care were more likely to have their preferences honored than hospitalized older adults without an LW (Silviera, Kim, & Langa, 2010). Patients with an HCP were less likely to receive all care possible or die in the hospital than were patients without a designated decision maker.

The physician orders for life-sustaining treatments (POLST) is intended to surmount the barriers and problems associated with traditional EOL treatment orders and processes. It not only reflects a patient's preferences about CPR but also includes medical orders about hospitalization, antibiotics, ANH, comfort measures, and medical interventions (e.g., IV fluids, intubation). Known by a variety of names, such as the physician orders for scope of treatment (POST) or the medical orders for life-sustaining treatments (MOLST), the POLST is associated with reduced unwanted hospitalization, improved documentation of NH residents' wishes, fewer traditional DNR orders, and fewer full-code orders (Hickman et al., 2010). Consistency over time has not been reported.

Ethel L. Mitty

ENTERAL TUBE PLACEMENT

An enteral tube is broadly defined as any tube passed through the nose or mouth into the stomach or small intestine, or directly into the stomach or jejunum for the purpose of decompression, medication instillation, and/or feeding. Feeding by nasogastric (NG), orogastric (OG), or nasointestinal (NI) tubes is preferred when the gastrointestinal (GI) system is functional and the need for assisted feeding is expected to be short term (usually 6 weeks or less). Thus, many premature infants are fed through these tubes until their suck and swallow mechanisms mature sufficiently so they are able to coordinate sucking, swallowing, and breathing. Older children and adults requiring enteral nutritional support may also be fed through NG/OG/NI tubes until a decision can be made whether or not long-term enteral nutritional support will be needed. For clients requiring longer term support, a gastrostomy or jejunostomy tube can be inserted surgically, endoscopically, or using ultrasound guidance into the stomach or jejunum. It is also possible to insert a jejunal tube through a gastrostomy tube allowing simultaneous decompression of the stomach and feeding into the jejunum. Because placement issues related to gastrostomy/jejunostomy tubes are different, only the issues surrounding NG/OG/NI tubes will be discussed herein.

Enteral feeding is physiologic, achieves a positive nitrogen balance sooner than total parenteral nutrition, enhances gut healing, reduces bacterial translocation, is associated with low rates of sepsis, and is less costly (Ackerman, Ciechoski, & Marx, 1992; Jolliet et al., 1999; Kiyama, Witte, Thornton, & Barbul, 1998; Lipman, 1995; Schroeder, Gillanders, Mahr, & Hill, 1991; Strong et al., 1992; Van Leeuwen et al., 1994; Zaloga, 1991). Even in clients maintained primarily by total parenteral nutrition, small amounts of nutrients are fed into the lumen of the gut through enteral tubes to maintain the structure and function of the small intestine. For many clients, feeding by enteral tubes is a lifesaving procedure.

Previous studies found NG/OG/NI tube placement errors to be common, with prevalence rates in adults ranging from 1.3% to 89.5% depending on how narrow or broad the definition of error was (McWey, Curry, Schabel, & Reines, 1988; Niv & Abu-Avid, 1988). Studies in children found between 20.9% and 43.5% of NG/OG tubes are placed incorrectly when placement error is broadly defined as placement of the tube tip or orifices outside the stomach (Ellett & Beckstrand, 1999; Ellett, Croffie, Cohen, & Perkins, 2005; Ellett, Maas, & Forsee, 1998). Although estimates of error rates vary, there is no doubt they are too high.

Errors in placement of NG/OG feeding tubes, which include initial erroneous placements as well as displacements over time, can lead to serious complications. If a tube ends in the airway, feeding through the tube will result in pulmonary aspiration or other pulmonary complications. Feeding through a tube ending in the esophagus increases the risk of pulmonary aspiration. When an NG/OG tube erroneously passes into the duodenum and the client is fed formula requiring both gastric and pancreatic enzymes for complete digestion, malabsorption resulting in inadequate weight gain (or weight loss), diarrhea, and possibly dumping syndrome may occur. Increasing the safety of NG/OG feeding requires knowledge development in at least two of the following areas: predicting the insertion length for correct tube placement, determining tube position once placed, and intermittent monitoring before feeding and medication instillations between insertions. The current state of the science regarding each of these knowledge needs will be reviewed.

As far as researchers have been able to determine, the evidence for measuring from the nose to the bottom of the earlobe to the xiphoid (NEX) to predict the insertion length to place a gastric tube was presented by Royce, Tepper, Watson, and Day (1951) in which they reported their 6-month experience of feeding 30 premature infants weighing less than 1,800 g with indwelling NG tubes with 28/30 of the infants surviving. What Royce et al. actually wrote was that the NG tube was inserted until it was "estimated by rough measurement to have entered the stomach" (p. 79). A nursing textbook cited this article as a reference for the NEX insertion-length predictor. After that, authors/editors of other nursing textbooks either cited this nursing textbook or a previous edition of their nursing textbook as a reference for NEX. This insertion-length predictor remains the most commonly used method in clinical practice. Although several research groups over the years have found the NEX insertion-length predictor to be too short in children frequently leaving the tube tip and orifices, through which liquid feeding exits the tube, in the esophagus (Beckstrand, Ellett, & McDaniel, 2007; Ellett, Croffie, et al., 2005; Weibley, Adamson, Clinkscales, Curran, & Bramson, 1987; Ziemer & Carroll, 1978), a recent randomized controlled trial, involving 276 children with chronological ages ranging from 27 weeks gestational age + 1.7 weeks to 17 years 8 months, will hopefully lead to the demise of using the NEX insertion-length predictor in clinical practice. This group found that two NG/OG tube insertion-length predictors: (a) measuring from the nose to the bottom of the ear lobe to the mid-umbilicus (half way between the umbilicus and the xiphoid) (NEMU) and (b) age-related, height-based (ARHB) regression equations—were significantly superior to NEX in children (Ellett et al., submitted; Ellett, Cohen, et al., in preparation). In 173 neonates (<1 month corrected age), 92% of NG/OG tubes inserted using NEMU, 100% inserted using ARHB, and 61% inserted using NEX were correctly placed in the stomach, duodenum, or pylorus regions (Ellett et al., submitted). In this study, ARHB was only used in neonates >44.5 cm in length (Ellett et al., submitted). Similarly, in 103 older children (>1 month of age), 97% inserted using NEMU, 89% of the tubes inserted using ARHB, and 59% using NEX were correctly placed in the stomach, duodenum, or pylorus regions (Ellett, Cohen, et al., in preparation). Many tubes were inserted lengths longer than the direct distance from the gastroesophageal junction (GEJ) to the pylorus, but most followed the natural curvature of the stomach. A few passed into the pylorus or through the pylorus into the duodenum. There appears to be no way to predict which way a tube will curve. Therefore, only high tube placements in the esophagus or at the GEJ were considered placement errors in this analysis. During insertion, five tubes coiled in the esophagus leaving the tips of the tubes near the entrance to the respiratory tract. These placement errors would not have been known before feeding through the tubes without the abdominal radiograph required as part of the study. A new regression equation specific to neonates <1 month corrected age was developed as an outcome of this study (Ellett et al., submitted).

Two studies investigated insertion-length predictors for gastric tube placement in adults. In a study of 99 adult cadavers and 5 normal volunteers, Hanson (1979) concluded that the use of the NEX length to determine the insertion length for NG tubes was less accurate than the formula ([NEX – 50 cm]/2 + 50 cm) adapted from a regression equation using NEX, resulting in 91.4% accuracy for estimating the distance for placing the NG tube tip correctly in the stomach. Ellett, Beckstrand, et al. (2005) recommended a three-variable regression model using gender, weight, and the length measured from the nose to the umbilicus (NU) with the client lying supine with no pillow. Two nomograms, one for each gender, were provided to make this insertion distance predictor easier to use in practice.

Currently, an abdominal radiograph is the only consistently valid and reliable way to verify the position of flexible small-bore NG/OG/NI tubes. Radiographs have been recommended by many to determine tube placement when an NG/OG/NI tube is initially inserted or changed (Ellett et al., submitted; Ellett, Cohen, et al., in preparation; Gharib, Stern, Sherbin, & Rohrmann, 1996; Jackson, Payne, & Bacon, 1990; Metheny, Spies, & Eisenberg, 1988; Walsh & Banks, 1990). However, tube location must be monitored frequently before being used for feeding or medication instillation to ensure it has not become displaced, and the summative radiation risk of multiple radiographs as well as their expense makes the development of adequate bedside monitoring methods imperative.

Multiple methods have been recommended for placing tubes in the distal duodenum or jejunum. These vary from client positioning, use of promotility agents, pH-sensing tube, self-propelled tube, magnets, electrodes, fluoroscopic guidance, sonographic guidance, and endoscopic guidance (Ellett, 2006). These methods vary in cost, time involved, and success rates. In the future, possibly some of the lower cost methods will be found useful in determining NG/OG tube location either reducing or eliminating the need for radiographic verification.

Several bedside methods of detecting NG/OG/NI tube placement errors have been investigated in adults, including (a) aspirating gastric contents and measuring the pH, bilirubin, pepsin, and trypsin levels; (b) placing the proximal end of the tube under water and observing for bubbles in synchrony with expirations; (c) measuring CO_2 level at the proximal end of the tube; (d) auscultating for a gurgling sound over the epigastrium or left upper quadrant of the abdomen; (e) examining the visual characteristics of tube aspirate; and (f) measuring and recording the length from the nose or mouth to the proximal end of the tube. Unfortunately, all of the bedside methods have limitations. Each method will be discussed separately. In a study of 800 aspirates collected from 605 fasting adults, Metheny et al. (1999) found that gastric aspirates had significantly lower pH values (mean = 3.5) than intestinal aspirates (mean = 7.0). Approximately 15% of the gastric aspirates had pH values overlapping with the pH values of intestinal aspirates. In addition, pH values from four tubes inadvertently placed in the respiratory tract overlapped with the range in intestinal placements. Metheny, Smith, and Stewart (2000) found that the combination of pH, bilirubin, pepsin, and trypsin correctly classified 100% of respiratory placements and 93.4% of GI placements in adults; however, no bedside tests are commercially available for measuring bilirubin, pepsin, or trypsin, severely limiting their clinical usefulness. Although Ellett et al. (2005) found using the pH cutoff of 5 recommended by Metheny et al. for fasting adults was helpful in differentiating gastric from intestinal placement in a preliminary study involving children, their recently completed randomized controlled trial found pH to be less helpful because several tubes located in the pylorus or duodenum on radiograph had acidic aspirate pH readings, which incorrectly indicated they were placed in the stomach.

Placing the proximal end of the tube under water and observing for bubbles in synchrony with expirations involves risk that clients will aspirate water on inspiration, especially those being mechanically ventilated. There is evidence that CO_2 monitoring has the potential to differentiate respiratory from GI placement; however, it has yet to be used clinically (Burns, Carpenter, & Truitt, 2001; Thomas & Falcone, 1998). Simple auscultation is not a reliable method to assess tube position because injection of air into the tracheobronchial tree or into the pleural space can produce a sound indistinguishable from that produced by injecting air into the GI tract (Metheny, McSweeney, Wehrle, & Wiersema, 1990). Radiation of sound on auscultation is an even greater problem in children because of the small distances between internal organs. Metheny, Reed, Berglund, and Wehrle (1994) demonstrated that visual characteristics improved nurses' predictions of stomach and intestinal placements but reduced discrimination of respiratory placements. Finally, measuring and recording of the insertion length was helpful, especially if correct placement of the tube in the stomach was verified by radiograph at the time of insertion, as the length of tube extending from the nares or mouth can then be compared with this measured length before each feeding or medication instillation to detect slippage of the tube in or out. This method will not detect tubes that have migrated internally during severe coughing, nasotracheal suctioning, retching, or vomiting with no slippage (Ellett, 2006).

In summary, although estimates of tube placement errors vary, there is no doubt that they are common and high placements (esophagus or GEJ) can lead to serious complications. The direct NEX distance, the insertion-length predictor currently used in practice, has been found to be inaccurate in both adults and children. Both the Hanson (1979) method and the Ellett et al. (2005) regression equation using gender, weight, and NU have been found to be more accurate in adults for placing NG/OG tubes in the stomach on insertion. Both NEMU in children of any size or ARHB in all children except infants <44.5 cm in length have been found to be more accurate insertion-length predictors for placing NG/OG tubes in the stomach on insertion. Verifying correct placement of the NG/OG tube by radiograph on initial insertion and whenever the tube is changed is recommended in children (Ellett et al., 2005; Ellett et al., submitted; Ellett, Cohen, et al., in preparation). Because none of the bedside methods are sufficiently accurate when used alone, a combination of assessing whether the tube insertion length has changed and assessing the color (gastric fluid is usually white, tan, colorless, or green) and consistency (gastric fluid is usually cloudy) of tube aspirate along with pH testing for interim monitoring of NG/OG tube location is recommended.

Marsha L. Ellett

EPILEPSY

Epilepsy refers to a chronic condition characterized by recurrent *seizures*. A seizure is a temporary alteration in functioning caused by an abnormal discharge of neurons in the central nervous system (Holmes, 1987). The exact nature of the seizure depends on the function of the brain cells that are affected by the abnormal discharge. Seizures are classified into two major types: *partial* and *generalized.* Partial seizures, which occur when the electrical discharge remains in a circumscribed area of the brain, can be broken down further into elementary or complex divisions. With elementary partial seizures, the person's consciousness is not impaired. With complex partial seizures, there is some impairment of consciousness. In some persons with partial seizures, the abnormal discharge spreads throughout the brain and is referred to as a partial seizure with secondary generalization. Generalized seizures occur when the discharge affects both brain hemispheres and results in a loss of consciousness. The two most common types of generalized seizures are generalized tonic clonic and absence. In generalized tonic clonic seizures, the person typically stiffens all over in the tonic phase, has jerking movements of the arms and legs in the clonic phase, and is incontinent of urine. After the seizure, the person is commonly sleepy. In absence seizures, there are a few seconds of loss of consciousness. The person generally stares blankly and sometimes rotates the eyes upward. An absence seizure begins and ends abruptly (Dreifuss & Nordli, 2001). Epilepsy affects more than 2 million persons in the United States. The cumulative incidence to age 80 years is 1.3% to 3.1%. Incidence rates are highest among those younger than 20 years and older than 60 years. The trend is for the frequency of epilepsy to be decreasing in children and to be increasing in the elderly. Rates are slightly higher for men than for women.

The prevalence of active epilepsy, defined as having had a seizure in the past 5 years or taking daily antiepileptic medication, is between 4.3 and 9.3 per 1,000. In approximately 70% of new cases of epilepsy, there is no specific identified cause. In the remaining 30%, the risk factors for epilepsy are severe head trauma, infection in the central nervous system, and stroke. In the United States, the prevalence of epilepsy is lower in Whites than in non-Whites, although the reasons for these differences are not clear (Hauser & Hesdorffer, 1990).

Remission of epilepsy, defined as 5 years without seizures, is more common among persons with generalized seizures, those with no neurological deficits, and those with a younger age of onset. Approximately 70% of persons with epilepsy can be expected to enter remission (Hauser & Hesdorffer, 1990).

The major treatment of epilepsy is *antiepileptic medication*. Most epilepsy is well controlled with such treatment, but approximately 20% of persons continue to experience seizures despite treatment with medications. When partial seizures originate from a well-defined focus in an area of the brain that could be excised without serious neurological deficits, surgery to remove the affected part of the brain is an option. Other treatments for epilepsy have been tried with some success. The ketogenic diet, which consists of food high in fat and low in carbohydrates, has been used since the 1920s. Recently, there has been increased interest in the ketogenic diet as a treatment. Another recent treatment is the vagus nerve stimulator, which sends electrical energy to the brain via the vagus nerve (Epilepsy Foundation, n.d.).

Most nursing research has been devoted to the impact of epilepsy on the quality of life. Some persons have severe quality-of-life problems that prevent them from engaging in fully productive lives. The exact prevalence of these problems is difficult to establish because most studies have been carried out on clinic samples, that is, on persons with seizures that are more difficult to control. Problems most commonly found in children include attention problems, anxiety, social isolation, depression, behavior problems, and academic underachievement (Austin & Dunn, 2000). Research in children suggests that behavior problems are already evident at the time of the first recognized seizure (Austin et al., 2001). The most common problems found in adults with epilepsy are unemployment, depression, social isolation, and problems with adjustment. Unemployment may be twice as high in persons with epilepsy as in the general population (Hauser & Hesdorffer, 1990). Factors generally associated with quality-of-life problems are severe and frequent seizures, presence of comorbidities, cognitive deficits, negative attitudes toward having epilepsy, and lack of a supportive family environment.

Research to provide an evidence base for care of persons with epilepsy is growing. However, studies are still needed (a) to understand the factors that lead to quality-of-life problems, (b) to test nursing interventions that prevent or reduce quality of life problems, and (c) to test self-management interventions for adults as well as children with epilepsy and their families. DiIorio et al. (2009) have developed and pilot tested an innovative Web-based, self-management intervention for adults with epilepsy. Nurses should play a major role in developing knowledge to guide nursing practice in with persons with epilepsy.

Joan K. Austin

ETHICS OF RESEARCH

Over the years, violation of human rights along with advances in science and technology has led to important codes of conduct, policy statements, and ethical guidelines that influence the ethics of research. Outside of nursing, important past codes of conduct include the Nuremberg Code, the Declaration of Helsinki, and the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research (also known as *The Belmont Report*). Within nursing, important past policy documents include the 1980, 1995, and 2003 American Nurses Association's (ANA, 2010c) social policy statements. Past ethical guidelines for nursing research include the ANA's 1975 and 1985 *Human Rights Guidelines in Clinical and Other Research* as well as the ANA-sponsored *Ethical Guidelines in the Conduct, Dissemination, and Implementation of Nursing Research* (Silva, 1995).

Current ANA documents implicitly or explicitly related to the ethics of research include (a) *Code of Ethics for Nurses with Interpretive Statements* (ANA, 2001, Provision 7), (b) *Nursing: Scope and Standards of Practice* (ANA, 2010b), (c) *Nursing's Social Policy Statement: The Essence of the Profession* (ANA, 2010c), (d) *Guide to the Code of Ethics for Nurses: Interpretation and Application* (Fowler, 2008, chap. 7), and (e) the Center for Ethics and Human Rights Web site that contains more than 20 position statements on ethics and human rights (ANA, 2010a). Information about the preceding documents is available at the http://www.nursingworld.org Web site. Information about federal regulations and guidelines for ethical research is available at the http://www.hhs.gov and http://www.fda.gov/oc/gcp Web sites.

The ethics of research, defined as what one morally ought to do or be in conducting, evaluating, disseminating, and applying research to practice, are based primarily on ethical principles and on moral character. Ethical principles focus on respect for autonomy, nonmaleficence, beneficence, and justice, whereas moral character focuses on virtues (Beauchamp & Childress, 2009).

The first ethical principle—that of respect for autonomy—focuses on how investigators support substantially autonomous research participants' decisions on whether or not to participate in research. Being substantially autonomous means overall capacity for voluntariness, for comprehension of information, and for freedom from controlling influences during the research experience (Beauchamp & Childress, 2009, chap. 4). If one or more of these factors is missing, ethical issues of autonomy arise.

Investigators support research participants' autonomy by ensuring that voluntariness, comprehension, and freedom from controlling influences are operationalized through informed consent statements. These statements typically contain purpose of the research, duration of participants' involvement, data collection processes and procedures, research benefits and risks, contact information, and information related to voluntariness, anonymity, and confidentiality. The informed consent statement also may ask research participants to verify that they substantially comprehend what the research entails before their written, audio, or video consent to participate in it. The preceding informed consent process should be dynamic and ongoing.

In addition to informed consent statements, and when appropriate, participants may be asked to sign the Health Insurance Portability and Accountability Privacy Rule Authorization for research (U.S. Department of Health and Human Services, 2004). This authorization permits a covered entity to use or disclose a participant's protected health information as specified by the authorization.

Not all research participants are substantially autonomous. Exceptions include pregnant women, children (unless emancipated minors), persons who are institutionalized, and persons with mental impairments or terminal illnesses. To ensure such situations are ethical, proxy consents are needed and, with children older than 7, both proxy consents and children's assent are often obtained.

Some investigators omit informed consent when the Internet is used in research, when informed consent could affect the validity of study results, and/or when minimal or no harm to research participants is anticipated. However, other investigators consider omission of informed consent unethical.

The second and third ethical principles—those of nonmaleficence (do no harm) and beneficence (prevent harm and do good)—focus primarily on minimizing risks and maximizing benefits. Risks may be psychological (e.g., anxiety), physiological (e.g., side effects of drugs), social (e.g., ostracism), or economic (e.g., child care costs). To minimize these risks, investigators assess their nature, number, and severity. In addition, organizations involved with research mandate institutional reviews—often operationalized through institutional review boards—to ensure that research being conducted is ethical. The overriding ethical principle regarding nonmaleficence in research is this: Take the smallest amount of risk possible to meet the research purpose.

As with risks, benefits also may be psychological (e.g., decreased anxiety), physiological (e.g., increased muscle relaxation), social (e.g., access to support services), or economic (e.g., financial compensation). Benefits may help individual study participants, other individuals, or society. They should be maximized to prevent harm or to do good.

The ethical principles of nonmaleficence and beneficence also apply to research with animals. Investigators should (a) use animals for research only when necessary, (b) obtain approvals of regulatory agencies and/or animal-care-and-use committees before research, (c) use the least-sentient animals that serve the research purpose, (d) inflict the least amount of harm to the fewest animals, and (e) provide the animals with necessary care and protection. Despite these safeguards, some investigators oppose animal research; they claim that harming animals is never morally justifiable.

The fourth ethical principle—that of justice—focuses both on fairness (what one deserves or is owed) and on distribution (what should be allocated to one). The latter is known as distributive justice. Fairness often focuses on selection or omission of research participants. The guiding principles are that participants are selected only on the basis of the research requirements and that these requirements be ethical. Characteristics of subject selection such as gender, race, religion, and socioeconomic status may present ethical issues of justice as fairness. They also may present ethical issues of power imbalances. These imbalances are often explored by feminist ethicists.

Whereas nonmaleficence and beneficence focus on risks and benefits, the ethical principle of distributive justice focuses on allocation of them, that is, whether they should be allocated equally or according to need, merit, contribution, or market demand (Beauchamp & Childress, 2009, chap. 7). For example, if equal allocation is chosen, investigators may ask research participants to submit to a routine blood test with an equal risk for all (e.g., a painful needle prick) or to complete participation in a study with an equal benefit for all (e.g., a gift of a bookmark).

The ethics of research also focus on one's moral character, namely, on who one ought to be as an investigator. One response is that investigators ought to be persons who aspire toward moral excellence in research through possession of virtuous traits such as compassion, caring, trustworthiness, and integrity (Beauchamp & Childress, 2009, chap. 2). Compassionate investigators possess awareness of the stresses and sufferings of research participants and do not negate their welfare for sole pursuit of the research. Caring investigators possess commitment to research participants through concerned connections and responsible relationships with them. Trustworthy investigators possess moral reliability, allowing research participants to believe with confidence that investigators will follow through with commitments. High integrity investigators possess completeness and steadfastness of character in their personal and professional lives.

Because integrity integrates several virtues inherent in moral character, ethical investigators prize it and avoid lapses in integrity. One such lapse is scientific (research) misconduct, which may take the forms of plagiarism, data falsification, data fabrication, irresponsible authorship, and questionable research practices. Plagiarism refers to passing off as one's own the ideas or words of another. Data falsification refers to manipulating research results by altering or omitting them so that their validity is questionable. Data fabrication refers to making up of research results. Irresponsible authorship refers to claiming authorship credit when one's role as author and/or researcher is negligible. Questionable research practices refer to deviating from acceptable ethical standards in the conduct, evaluation, dissemination, or application of research into practice.

To deter unethical behavior related to the preceding five components of scientific misconduct, individuals and organizations have instituted safeguards for research. These safeguards include the U.S. Department of Health and Human Services Office of Research Integrity, research review boards, policy documents and guidelines, peer and editor reviews of research publications, use of best research evidence for practice, and opportunities for Magnet status.

Future directions for research include (a) generation of ethical research guidelines for unprecedented advances in science and technology that pose moral issues, (b) selection of interdisciplinary teams of researchers and ethicists to monitor the impact of unprecedented advances in science and technology on research participants and on human rights in research, and (c) further development of ethical position statements on the current and future use of tele-health and the Internet in research.

In summary, the ethics of research are primarily based on ethical principles and on moral character. Within these parameters, ethical issues arise. Examples included herein focused on nature of autonomy, on severity of risk, and on decisions of allocation. These are familiar ethical issues. However, in the future, as ethical issues related to societal changes and to advances in science and technology intensify, they will present unprecedented and compelling moral challenges for investigators and for the ethics of research. Two such challenges are transgenics and synthetic DNA. Nevertheless, regardless of the challenges, the one uncompromising principle underlying all research is that it be ethical.

Mary Cipriano Silva

ETHNOGERIATRICS

Ethnogeriatrics, an evolving geriatrics subspecialty, is a multidisciplinary approach to eldercare focusing on the interrelatedness of aging, health, ethnicity, geriatrics, ethno-gerontology, and transcultural health, specific to quality health care and quality of life in racial/ethnic minorities. The U.S. Census Bureau (2008a) categories for racial/ethnic groups are Black/African American, American Indian and Alaska Native, Asian American, Hispanic/Latino, and Native Hawaiian/Pacific Islander. By 2050, one third of the population 65 years and older from this group is projected to be Black/African American, Hispanic/Latino, and "other races" category, mainly of Asian and Pacific Islander groups (Administration on Aging, 2009). These growth rates, persistent health disparities, health literacy, and cultural and language challenges underscore an ethnogeriatric imperative (Institute of Medicine, 2008; Smedley, Stith, & Nelson, 2003; Yeo, 2009).

Some key concepts in ethnogeriatrics include heterogeneity, cultural values and traditions, health beliefs and practices, health literacy, access to health care, acculturation, language and communication, cohort historical experiences, explanatory models, spirituality, and access and utilization of health care (Yeo, 2001). These topics are important in relation to human responses to health and illness, management of chronic physical and mental illnesses, caregiving, sensory loss, elder abuse, disaster preparedness, decision making, advance directives, end-of-life care, and other health care events (Adler, 2006; Adler & Kamel, 2004; Gerdner, Cha, Yang, & Tripp-Reimer, 2007; Graves, Rosich, McBride, & Charles, 2010; Grudzen, 2008; Hendrix & Swift Cloud-LeBeau, 2006; Lewis & McBride, 2004; McBride, 2006; McBride & Lewis, 2004; McBride, Fee, & Yeo, 2004; Talamantes, Trejo, Jimenez, & Gallagher-Thompson, 2006).

In 1987, the Stanford Geriatric Education Center introduced ethnogeriatrics to the national multidisciplinary network of geriatric education centers and health sciences programs (Lewis & McBride, 1996; Wallace & McBride, 1996). The Stanford Geriatric Education Center multiethnic, multidisciplinary faculty developed core competencies to guide curriculum development and research and produced Web-based resources available at http://sgec.stanford.edu/. In 1997, a chapter on ethnogeriatrics was part of a publication of priorities for geriatric education from a national workshop of federally funded Geriatric Education Centers (Henderson et al., 1996).

Mather Institute on Aging, one of the three Health Resources and Services Administration grantees, trained advance practice nurses to teach geriatrics, focusing on ethnogeriatrics and managed care (Hollinger-Smith, 2003). In 2002, the Nurse Competency on Aging project, developed a Web-based, on-demand geriatric nursing modules including one on ethnogeriatrics. The Nurse Competency on Aging's outreach to minority nurses organizations to increase members' knowledge and skills on eldercare resulted in small grants to two groups that focused on ethnogeriatrics—the Asian American Pacific Islander Nurses Association and the Philippine Nurses Association of America (Mezey, Stierle, Huba, & Esterson, 2007).

More research is essential to understand the factors and cultural contexts that influence health beliefs and illness, availability and accessibility of health care, patient–provider trust, and confidence in achieving the desired outcomes. These factors include indigenous practices, English-language proficiency, health literacy, cohort historical experiences, immigration patterns, family and support network, Internet technology, economy, and changes in public policies (Adler, 2006; Adler & Kamel, 2004; Graves et al, 2010; Institute of Medicine, 2008; McBride & Lewis, 2004; Pavalko & Wolfe, 2009; Smedley et al., 2003; Yeo et al., 1998).

Although racial/ethnic populations may share some values, belief systems, and behavioral norms, the mode of expression varies among the groups across historical, social, psychological, and health domains. This heterogeneity requires that health providers become more aware and sensitive to cultural nuances to tailor health care to the ethnic elders' needs (Adler, 2006; Adler & Kamel, 2004; Xakellis et al., 2004). Thus, cultural context adds an important dimension to the complexity of decision making related to health promotion, long-term care, advance directives, end-of-life care, and other health care issues (Adler, 2006; Adler & Kamel, 2004; Gerdner et al., 2007).

In 2008, approximately 1.89 million older adults, 65 years and older, lived in households with a grandchild and 25% had primary parenting responsibility for their grandchildren or great grandchildren (Administration on Aging, 2009). Divorce, illness, substance abuse, or incarceration often lead to this role. Diversity and structure of contemporary families brought about by teenage pregnancy, delayed parenting by women, childlessness, stepgrandparenting, and same-sex couples have implications for social support, caregiving patterns, and family economics. Immigrants 65 years and older who potentially may choose to live with family are Hispanic and Asian immigrants mostly from Mexico, Central and South America, India, and Pacific Islands (Bengston, Kim, Meyers, & Eun, 2000; Wilmoth, 2001).

The health belief model and the transtheoretical model discussed by McBride and Lewis (2004) were adapted for research on preventive health and health promotion, respectively, in ethnic elders. The transcultural assessment evaluates effects of six cultural phenomena on health and illness behaviors (communication, space, social organization, time, environmental control, and biological variations). These frameworks are attractive knowledge silos to initiate ethnogeriatric nursing research.

The chronic care model (Wagner et al., 2001), a systems-change guide with six components (community, health systems, self-management support, delivery system design, decision support, and clinical information systems), can be adapted for ethnogeriatric nursing research. Exploring the interplay between health disparities, health literacy, health beliefs, and Internet technology to improve health care for ethnic elders especially the disenfranchised, underserved, or hard-to-reach groups would contribute to changes in nursing systems.

To assess health literacy level, SPEAK (Speech, Perception, Education, Access, and Knowledge) is a useful guide in working with minority elders (Kobylarz, Pomidor, & Heath, 2006). Care models that resonate with nursing values are also important frameworks for ethnogeriatric research. The patient-centered care model individualizes health care, respects the patient's values and perspectives, and considers the patient to be an expert of his or her illness (Lorig et al., 2001). The relationship-centered care model incorporates the provider's personhood, self-awareness, cultural humility, and empathy into building trust relationships for a health outcome (Beach & Inui, 2006; Suchman, 2006).

The anticipated peak in population for older adults by 2050 underscores the trend of obvious growth in the number of ethnic elders and a critical need for research in ethnogeriatrics. It is imperative that such knowledge is part of the foundation for evidence-based nursing care for ethnically diverse communities. There is much to learn about the cultural context of health issues to inform the development of effective guides for cultural competence and cultural humility to increase health literacy and eliminate health disparities in the older racial/ethnic minority groups (McBride & Lewis, 2004; Xakellis et al., 2004). A new challenging frontier, the American society of the twenty-first century, is an in vivo laboratory for ethnogeriatric nursing research.

Melen R. McBride
Irene Daniels Lewis

ETHNOGRAPHY

The term *ethnography* translates as "the written description of the folk" and refers to both a specific naturalistic research method and the written product of that method. As a research process, ethnography is a comparative method for investigating patterns of human behavior and cognition through observations and interactions in natural settings. As a written product, ethnography is a descriptive or interpretive analysis of the patterns of beliefs, behaviors, and norms of a culture. Culture, in the ethnographic sense, is an integrated pattern of human knowledge, symbolic thought, everyday practices, and material artifacts that is created, shared, and modified by people who interact with each other. The focus on culture and cultural processes is central to ethnography and is one of the ways in which ethnography differs from other naturalistic methods such as grounded theory (the study of basic social processes) and phenomenology (the study of individuals' lived experience).

Anthropologists developed ethnography to understand people who lived in other cultures and practiced traditions different from their own. Although ethnography remains the primary research method in anthropology, it is also used by researchers in many other disciplines, most notably sociology, psychology, education, management science, and nursing. As the method was adopted outside anthropology, the focus of study shifted from small-scale or tribal societies to topical subjects more closely linked with the interests and scientific foci of the adopting discipline. For example, the study of small urban social communities was undertaken by sociologists from the Chicago School, investigations of schools as microcosms of society were addressed by educators, and ethnic health beliefs and lay systems of care were targeted by nurse anthropologists.

In the discipline of nursing, ethnography was introduced into the literature primarily by nurse anthropologists beginning in the late 1960s. Seminal articles by Elizabeth Byerly (1990) and Antoinette Ragucci (1990) were published in *Nursing Research* and laid the foundation for future nurse ethnographers. As the federally funded Nurse Scientist Program sponsored doctoral education for registered nurses, many recipients chose anthropology as their focus of study. This first generation of nurse ethnographers included pioneers such as Madeleine Leininger, Agnes Aamodt, Pamela Brink, Margarita Kay, and Oliver Osborne. A second generation of nurse anthropologists included Juliene Lipson, Evelyn Barbee, JoAnn Glittenberg, Marjorie Muecke, Janice Morse, and Toni Tripp-Reimer. Later, as doctoral programs in nursing developed, some nurses were trained in ethnography within schools of nursing.

Researchers using ethnographic frameworks may assume either a whole culture perspective in their investigations or take a more focused approach. Macro-level ethnography is typified by long-term field studies of an entire culture. The researcher seeks to distinguish a single group of people from other cultural groups by describing the people's lifeways, language, religion, kinship patterns, economic system, geographic habitat, health systems, and technologies. In contrast, focused ethnography takes a micro-level approach to understanding cultural processes, often from within the researcher's own society and for the purpose of applying cultural knowledge to solving practical problems. Through short-term, immersive field visits and key informant interviews, focused ethnographers gather background information about people within a particular cultural context and on a narrowed subject matter.

Although more than a dozen distinct research traditions are subsumed under the term ethnography, each method emerged within a particular historical context to address somewhat different elements of culture. Nurse researchers may use any of these approaches given the appropriate research question. Five examples are presented to demonstrate the utility and flexibility of diverse ethnographic approaches to nursing research.

An early ethnographic approach developed by Boas around the turn of the twentieth century is termed *Historical Particularism*. The central tenet of this approach is that each culture has its own long and unique history and that all elements of a culture are worthy of documentation. Typical products of ethnographies conducted within this framework are descriptive narratives and cultural inventories. Nurse researchers have used this approach to identify specific folk healing treatments used within ethnic groups and to generate items for the construction of questionnaires.

Functionalism, which is associated with the anthropologists Malinowski and Radcliffe-Brown, is a second ethnographic tradition and, historically, the approach used most often in nursing research. Here, the task of ethnography is to describe the structural elements and their interrelated functioning in a culture. Prominent functionalist ethnographies in nursing include studies guided by Leininger's Culture Care Theory and its attendant Sunrise Model.

The goal of ethnoscience, a third ethnographic tradition, is to discover folk systems of classification to determine the ways people perceive and structure their thinking about their world and to identify the rules that guide decision making. The taxonomy of nursing activities known as the *Nursing Interventions Classification* was derived using an ethnoscience approach. Through such strategies as cognitive interviews and pile sorts, researchers identified how clinical nurses conceptualized their work-related tasks and patient care responsibilities.

Symbolic or interpretive ethnography is a fourth approach that is growing in application in nursing. Here, culture is viewed as a system of shared meanings and symbols. Ethnographers working within this tradition such as Geertz, Turner, and Douglas believe that cultural knowledge is embedded in "thick descriptions" of human behavior. Cultural members are interviewed to provide a social context for observed actions and to interpret cultural symbols and relevant motifs. Nursing research on explanatory models of illness and health or on the meaning of the body often is based within the symbolic or interpretive ethnographic tradition.

Institutional ethnography was introduced by Smith to investigate the social organization of everyday life. As communication and information media have assumed dominant positions in human interactions, institutional ethnographers use their method to map how texts, technologies, and information flows coordinate social relations and govern the daily activities of people within institutions. Institutional ethnographies have explored decision-making processes in long-term care and the role of patient satisfaction discourse within health care reform.

Fieldwork is the hallmark of ethnographic research. Fieldwork involves the investigator's immersion in the target community for long periods of time to gain understanding for contextualizing the ethnographic data gathered about a cultural group. The stages of fieldwork include (a) field entry, (b) development of relationships, (c) data collection, (d) data manipulation, (e) data analysis, and (f) departure. Many fieldwork stages (particularly items b–e) overlap in time, thus allowing for iterative relationship building, data gathering, and interpretation.

In conducting fieldwork, an investigator may use multiple data collection strategies including participant observation, informal interviews, structured interviews, photographs and videotapes, material artifacts, census and other statistical data, historical documents, projective tests, and psychosocial surveys. The variety of research strategies that are appropriately used is another way in which ethnography differs from most other naturalistic methods. Further, ethnographers may use quantitative data to augment qualitative data. However, the mainstay strategies of ethnography rest in participant observation and informant interviews. If the focus of the ethnography concerns the cognitive realm (attitudes, beliefs, schemata) of the members of the culture, then interviewing is the primary strategy. On the other hand, if the focus of the ethnography involves structural features or patterns of behavior, then observations are the primary strategy. The majority of ethnographies, however, use a combination of strategies.

Data manipulation methods include field notes and memo systems, coding strategies, and indexing systems. Recently, computerized software programs such as NVivo and ATLAS.ti have aided in the management of data in ethnographic projects. Methods used in data analysis include matrix, thematic, and domain analysis.

In summary, ethnography is a naturalistic research method designed to describe the culture of a social group or organization. The ethnographer seeks to understand another way of life from the perspective of a person inside the culture (emic view) rather than from the positions of outsiders (etic view). Participant observation and informant interviewing are the major data collection strategies used during ethnographic fieldwork. The specific ethnographic tradition used by the investigator determines the appropriate form of the ethnographic product.

Toni Tripp-Reimer
Stacie Salsbury Lyons
Bernard Sorofman
Jimmy Reyes

EVALUATION

Evaluation is a method for measuring the effect of some purposeful action on a particular situation. It is often described as an assessment of worth. In evaluation, both anticipated and unanticipated outcomes are important and are included in the discussion of findings and the publication of results. The purpose of evaluation is to provide information for decision makers who usually have some stake in the outcome of the intervention.

Evaluation methods have been categorized along a continuum ranging from simple assessment, in which informal practices are used to look for indication of outcome, to evaluation research, in which research methods are used to allow for generalization to other comparable situations. In actuality, the use of informal practices for determining intervention outcome is never appropriate. Consequently, the term *evaluation* should suffice for all efforts in which a systematic process is used to determine the effect of some intervention on some anticipated outcome. The research component of the term is assumed. No matter what the purpose of the evaluation, the issue of rigor is always foremost, and the methods and measurement approaches used should involve the same level of attention given to any research method.

Evaluations serve one of three purposes: (1) to conceptualize and design interventions, (2) to monitor implementation of some intervention, or (3) to assess the utility of some action. In the first type of evaluation, studies focus on (a) the extent of the problem needing intervention, (b) who should be involved in or targeted for the intervention, (c) whether the intervention proposed will address the problem or the needs of individuals, and (d) whether the chance for successful outcome has been maximized. In the second type of evaluation, studies focus on what is done; they generally are referred to as process evaluation studies. These studies also determine whether the intervention is reaching the targeted population and whether what is done is consistent with what was intended. Process evaluations are essential for determining cause and effect, although they are not sufficient by themselves for measuring impact. That is where evaluation researchers often get into trouble. They stop collecting data once they describe what was done; therefore, process evaluation methods have tended to be viewed with disfavor, which is unfortunate. Although they are insufficient by themselves, they are absolutely necessary for determining whether the intervention caused the outcome and if so, how—and if not, why not. In the third type, studies determine both the degree to which an intervention has an impact and the benefit of the intervention in relation to the cost. The degree of impact is referred to as the intervention's effectiveness, and the degree of cost is referred to as its efficiency.

Recent writings on evaluation focus on the need for theory to guide the investigation and frame the results. Authors have identified theories that range from those targeted solely for the purposes of designing evaluations to those directed at the expected relationships between intervention and outcome. For example, behavioral theories often are used to develop interventions targeted at changing health behaviors; they also are used to select measures for determining impact. Evaluation theories, on the other hand, focus on the purpose of the study—whether it is for determining what goals or outcomes should be examined, how the treatment should be developed and delivered, or under what conditions certain events occur and what their consequences will be. Measuring the true effect of the intervention often is difficult. Evaluation studies are subject to the same measurement and analysis problems associated with other designs. In addition, Ingersoll (1996) has summarized several others that are important to evaluation research. Among these is the need to measure the extent of the intervention introduced, which is frequently absent from reports of evaluation studies. This information assists in demonstrating cause-and-effect relationships and clarifies what magnitude of the intervention is required before an effect is seen. It also helps to prevent the potential for Type III, IV, and V evaluation errors, which affect statistical conclusion validity and generalizability validity.

Type III evaluation error is an error in probability and results in solving the wrong problem instead of the right problem. It usually occurs when the program is not implemented as planned and when insensitive measures are used to determine effect. Type IV error occurs when the evaluator provides information that is useless to stakeholders. Type V error involves confusing statistical significance with practical significance, which ultimately leads to Type IV error.

Evaluation is the key to measuring intervention magnitude and effect. To assure that evaluations are useful, however, steps must be taken to design them according to some meaningful conceptual framework, and close attention must be paid to maximizing the rigor of the methods, analysis, and rejection of alternative hypotheses. Approaches to quality control recommended for other nonexperimental, quasi-experimental, and experimental designs are appropriate. With attention to these aspects of the evaluation process, evaluations become an effective means for extending nursing science.

Gail L. Ingersoll

EVIDENCE-BASED PRACTICE

Evidence-based practice (EBP) is the conscientious use of current best evidence in making decisions about patient care (Sackett, Straus, Richardson, Rosenberg, & Haynes, 2000). It is a problem-solving approach to the delivery of health care that integrates the best evidence from research with a clinician's expertise and a patient's preferences and values (Melnyk & Fineout-Overholt, 2011). When delivered in a context of caring and in an organizational culture that supports EBP, the best patient outcomes are achieved. Although it is well recognized that EBP improves the quality and safety of health care as well as decreases hospital costs and patient morbidities, evidence-based care is not consistently implemented by point of care clinicians and health care systems across the United States (McGinty & Anderson, 2008; Pravikoff, Tanner, & Pierce, 2005; Williams, 2004). Unfortunately, it typically takes well over a decade to translate findings from research into clinical practice to improve care and patient outcomes. Recognition of the long research-practice time lag resulted in the Institute of Medicine setting a goal that by the year 2020, 90% of clinical decisions will be supported by the best available evidence (McClellan, McGinnis, Nabel, & Olsen, 2007).

For clinicians to use evidence to make daily decisions about patient care, there must be an understanding of the two types of evidence in EBP: (1) external evidence that is generated through rigorous research and (2) internal evidence that is generated through quality improvement, outcomes management, and EBP implementation projects within clinicians' own practice settings. Internal evidence is important in evidence-based decision making to demonstrate outcomes from evidence-based interventions as well as when rigorous studies do not exist to guide best practices. Evidence for interventions is leveled from Level 1 (i.e., systematic reviews of randomized controlled trials), which is the strongest level of evidence to guide clinical practice, to Level 7 (i.e., evidence from expert opinion). The level of the evidence plus the quality of that evidence as determined from critical appraisal determines the strength of the evidence, which provides clinicians the confidence to act upon the evidence and implement best practices (Melnyk & Fineout-Overholt, 2011).

Dr. Archie Cochrane, a British epidemiologist, is credited with starting the EBP movement when he challenged the public to pay only for health care that had been supported as efficacious through research (Enkin, 1992). In 1972, he criticized the medical profession for not providing rigorous systematic reviews of evidence so that organizations and policy makers could make decisions about health care. He contended that thousands of low-birth-weight premature infants had died needlessly because the results of several randomized controlled trials were not synthesized into a systematic review to support the practice of routinely providing corticosteroid injections to high-risk women in preterm labor to halt the premature birth process. Archie Cochrane considered systematic reviews to be the strongest level of evidence to guide practice decisions (Cochrane Collaboration, 2001). Although he died in 1988, Dr. Cochrane's influence was responsible for the launching of the Cochrane Center in Oxford, England, in 1992 and the founding of the Cochrane Collaboration (2001) a year later. The purpose of the Cochrane Collaboration is to provide and routinely update rigorous systematic reviews of health care interventions to guide best practices.

In the United States, the U.S. Preventive Services Task Force, an independent panel of experts in primary care, research, and prevention systematically reviews the evidence of effectiveness and develops gold standard recommendations for clinical preventive services that include screening, counseling, and preventive medications (Agency for Healthcare Research and Quality, 2008). The U.S. Preventive Services Task Force produces a *Guide to Clinical Preventive Services* every year that includes its updated evidence-based recommendations for primary care providers.

In EBP, there are 7 steps that include the following:

1. Cultivate a spirit of inquiry
2. Ask the burning clinical question in PICOT format
3. Search for and collect the most relevant evidence
4. Critically appraise the evidence (i.e., rapid critical appraisal, evaluation, and synthesis)
5. Integrate the best evidence with one's clinical expertise and patient preferences and values in making a practice decision or change
6. Evaluate outcomes of the practice decision or change based on evidence
7. Disseminate the outcomes of the EBP decision or change (Melnyk & Fineout-Overholt, 2011).

Without a spirit of inquiry, clinicians may find it challenging to ask burning clinical questions about their practices (e.g., In intensive care unit patients, how does early ambulation compared with delayed ambulation affect the number of ventilator days? In orthopedic patients, how does analgesia administered by the triage nurse compared with waiting for physician ordered analgesia affect pain and length of time in the emergency room?). Asking questions in PICOT (P = *patient population*, I = *intervention or area of interest*, C = *comparison intervention or group*, O = *outcome*, and T = *time*) format leads to a more time efficient and effective search for evidence. Articles from the search are then rapidly critically appraised, evaluated, and synthesized to determine whether a practice change on the basis of the best evidence is indicated. Relevant, reliable evidence is then integrated with the clinician's expertise and patient preferences and values in making a practice decision or change. Clinician expertise involves health care provider skills and interpretation of patient assessment data, internal evidence, use of health care resources, and other important information that is relevant to the clinical decision and outcome. Once an evidence-based change is made in clinical practice, measurement of key outcomes is necessary to demonstrate that the impact expected of the change indeed occurred in a clinician's own practice setting. The final step in EBP is disseminating the outcomes of the evidence-based change so that others might benefit from the process.

Although EBP produces better outcomes than care that is steeped in tradition and a known process exists for implementing evidence-based care, there are multiple barriers that exist within individuals and institutions that are slowing the widespread adoption of evidence-based care. Barriers in individuals include (a) the perception that EBP takes too much time, (b) the inadequate knowledge and skills in EBP, and (c) a lack of confidence to implement change. System barriers include (a) contextual environment and culture that does not support EBP, (b) lack of resources required for EBP, (c) lack of EBP mentors who can assist with EBP implementation at point of care, and (d) nurse administrators and managers who do not model EBP. Conversely, there are a number of factors that facilitate the implementation of EBP, including (a) EBP knowledge and skills, (b) beliefs about the value of EBP and the ability to implement it, (c) a context and culture that supports EBP and provides the necessary tools to support evidence-based care (e.g., time to search for evidence, access to computer data bases at point of care), and (d) EBP mentors (i.e., advanced practice nurses with expertise in EBP as well as organizational and individual behavior change strategies) who work directly with clinicians at the point of care in implementing EBP (French, 2005; Kitson et al., 2008; Melnyk, 2007; Melnyk, Fineout-Overholt, & Mays, 2008; Melnyk, Fineout-Overholt, Stillwell, & Williamson, 2009).

There are several conceptual models that have been developed to facilitate a change to EBP in individuals and health care systems. These models include (a) the EBP decision-making model by DiCenso, Ciliska, and Guyatt; (b) the Stetler model of EBP; (c) the Iowa model of EBP to promote quality care by Marita Titler and colleagues; (d) the model for EBP change by Rosswurm and Larabee; (e) the Advancing Research and Clinical Practice Through Close Collaboration model by Melnyk and Fineout-Overholt; (f) the Promoting Action on Research Implementation in Health Services framework by Rycroft-Mallone, Kitson, and colleagues; (g) the clinical scholar model by Schultz; and (h) the Johns Hopkins nursing EBP model by Newhouse and colleagues (Ciliska et al., 2011). It is increasingly recognized that efforts to change practice should be guided by conceptual models (Graham, Tetroe, & the KT Theories Research Group, 2007). As these models are supported by evidence from research, they will become even more valuable in helping clinicians deliver evidence-based care.

In summary, EBP is necessary to ensure the highest quality of cost-effective care and the best patient outcomes. Efforts in the future must be accelerated and placed on (a) educating both practicing clinicians and health professional students in the EBP process with emphasis on the building of EBP skills; (b) creating cultures of EBP that provide resources, EBP mentors, and support to clinicians to engage in and sustain evidence-based care; (c) providing incentives for EBP; and (d) establishing evidence-based clinical practice guidelines and policies that are incorporated into technology (e.g., electronic health records) to facilitate best practice by clinicians at the point of care (Melnyk & Williamson, 2010).

Bernadette Mazurek Melnyk
Ellen Fineout-Overholt

EXPERIMENTAL RESEARCH

True experiments have the potential to provide strong evidence about the hypothesized causal relationship between independent and dependent variables. Experiments are characterized by manipulation, control, and randomization. The quality of experiments depends on the validity of their design.

Manipulation means the researcher actively initiates, implements, and terminates procedures. In most instances, manipulation is linked to the independent variable(s) under consideration. Essential to manipulation is that the researcher has complete control over the process. The researcher decides what is to be manipulated (e.g., selected nursing intervention protocols), to whom the manipulation applies (e.g., samples and subsamples of subjects), when the manipulation is to occur according to the specification of the research design, and how the manipulation is to be implemented.

Manipulation implies and is impossible without researcher control over extraneous sources that might affect and lead to incorrect scientific conclusions. Control aims "to rule out threats to valid inference." It also adds precision, the "ability to detect true effects of smaller magnitude" (Cook & Campbell, 1979, p. 8). Unlike laboratory studies where total control is often possible, in clinical research control is a relative matter. The researcher has the responsibility for ensuring as much control over extraneous forces as possible.

Control also includes "the ability to determine which units receive a particular treatment at a particular time" (Cook & Campbell, 1979, p. 8). This refers to control over two processes that determine who gets what at what time. The first process is the researcher's use of randomization methods to assign subjects to treatments. This is the preferred method of exerting control over subjects and their treatment as, theoretically, it ensures that known and unknown extraneous forces inherent to subjects are dispersed equally across the different treatment arms. This may not always be possible, in which case the second process comes into play—that of structuring the assignment process in such a way that major, known extraneous forces are controlled.

Commonly used design strategies include blocking, fixed and propensity matching, and counterbalancing. In blocking, the potentially confounding variable is incorporated into the study design as an independent variable. The levels of this variable are considered blocks, and subjects are assigned to blocks on the basis of their value on the blocking variable. Next, in each block, subjects are randomly assigned to the study arms. In fixed matching, a weaker but common method of control, the researcher identifies one or more extraneous (usually up to three) variables to be controlled. As soon as a subject is recruited for one of the treatment groups, the researcher then tries to find subjects for the other group(s) identical to the first subject on the specified matching variables. In propensity matching, all known or presumed confounding variables are used to calculate a propensity score for each subject. Subjects are then matched on this propensity score. Counterbalancing occurs when the researcher is concerned that the order in which treatments are administered influences the results. When counterbalancing is used, all subjects receive all treatments; however, the order of administration of treatments is varied.

Randomization entails two separate processes: (a) random selection of subjects from the population and (b) random assignment of subjects to treatment and control conditions. Random selection is the process of randomly drawing research subjects from the population about which the researcher wants to gain knowledge and to which the researcher hopes to generalize the findings of a study. Random assignment entails allocating sampling units (e.g., patients) to treatment and control conditions by using a decision method that is known to be random (e.g., coin toss, random drawing, use of random tables, computer-generated random sequences of options). For long, random selection was virtually nonexistent in intervention studies in nursing; moreover, a large proportion (55.3%) of nursing intervention studies did not even use random assignment methods (Abraham, Chalifoux, & Evers, 1992). This is changing with the growing emphasis on randomized controlled trials of nursing interventions.

In their classic text, Cook and Campbell (1979) reviewed four types of validity of research designs, potential threats to each, and strategies to remedy these threats. Statistical conclusion validity addresses the extent to which, at the mathematical/statistical level, covariation is present between the independent and dependent variables (i.e., the extent to which a relationship exists between the independent and dependent variables). Internal validity refers to whether an observed relationship between variables is indeed causal or, in the absence of a relationship, that indeed there is no causal link. Construct validity of putative causes and effects refers to whether the causal relationship between two variables is indeed "the one" and tries to refute the possibility that a confounding variable may explain the presumed causal relationship. External validity refers to the generalizability of an observed causal relationship "across alternate measures of the cause and effect and across different types of persons, settings, and times" (Cook & Campbell, 1979, p. 37). Validity of any type is not a yes/no issue of whether or not it is present. Rather, it is a matter of degree, determined by the extent to which the researcher has tried to cope with the various potential threats to each type of validity.

Ivo Abraham
Karen MacDonald

EXPLORATORY STUDIES

Exploratory studies are those that investigate little-known phenomena for which a literary or experiential search fails to reveal any significant examples of prior research. Exploratory studies are useful in nursing research in finding out more about the nature of a nursing-related problem or issue, and there usually is a small sample that focuses on one particular area of interest or on one or two variables. The kinds of research questions typically generated for exploratory studies are descriptive in nature and seek understanding (e.g., What is it like to be a pregnant teenager? Who needs home care? What health-promoting behaviors do cafeteria workers engage in? What is the lived experience of military widows and widowers?).

Because the intent of exploratory research is to find out and explore unknown phenomena, it is considered Level 1 research (designed to elicit descriptions of a single topic or population) and is reflected by many of the early research studies in nursing. An examination of early research designs used in nursing research includes the following: (a) staff nurse behaviors and patient care improvement (Gorham, 1962), (b) the self-concept of children with hemophilia and family stress (Garlinghouse & Sharp, 1968), and (c) women's beliefs about breast cancer and breast self-examination (Stillman, 1977).

Exploratory studies are still used in nursing research and are often thought of as an initial step in the description of more complex researchable problems or issues or as part of mixed methods studies. However, exploratory studies are particularly useful when the investigator seeks to gather baseline information on a particular variable that is difficult to measure, such as the concepts of loneliness or culture. Other researchers may wish to investigate a process about which little is known. An example might be the types and meanings of caring behaviors among elderly nursing home residents or the meaning of loss of a loved one. Additional rationales for exploratory studies include the need to focus on one concept that has not been described in any great detail in the literature, such as isolation or comfort, or the need to determine the feasibility for a more extensive study. Lastly, exploratory research can serve to establish baseline information for future studies.

Regardless of the intent of exploratory research, a flexible design that enables the researcher to investigate and examine all aspects of a phenomenon is encouraged. Flexibility in the design allows exploration of emerging ideas and changing direction, if needed, as data are collected and analyzed. Thus, exploratory research is not limited to one particular paradigm but may use either a quantitative or qualitative approach. Studies that propose a hypothesis and seek to provide a measure of a phenomenon as a description use a quantitative design such as that described by Lagan, Sinclair, and Kernohan (2010). In this study, Lagan et al. sought to discover how pregnant women used the Internet as an information source and the overall effect that it had on their decision-making processes. On the other hand, qualitative or naturalistic designs explore phenomena in the natural setting in which they occur and are commonly carried out by using semistructured or open-ended interviewing techniques and by observation. There are multiple approaches associated with qualitative research, but they all focus on those aspects of human behavior that are difficult to measure in numerical terms. One example of an exploratory qualitative study that used a grounded theory approach is that by McDonnell and Van Hout (2010). McDonnell and Van Hout sought to describe opiate users' experiences of self-detoxification by using a grounded theory approach. The study generated a substantive theory of self-detoxification as a subjective process of seeking heroin abstinence.

Most critiques of exploratory research cite a limited scope and focus, the lack of generalizability to a larger population, and the lack of a basis for prediction. In spite of these limitations, however, exploratory studies are useful to uncover or discover information about little-known phenomena or single concepts, to explore the existence of relationships between and among variables, to find out more about human behavior in a naturalistic setting, to lay the groundwork for more systematic testing of hypotheses, and to determine the feasibility for a more in-depth study.

Kathleen Huttlinger

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FACTOR ANALYSIS

Factor analysis is a multivariate technique for determining the underlying structure and dimensionality of a set of variables. By analyzing intercorrelations among variables, factor analysis shows which variables cluster together to form unidimensional constructs. However, it involves a higher degree of subjective interpretation than is common with most other statistical methods. In nursing research, factor analysis is commonly used for instrument development (Ferketich & Muller, 1990), theory development, and data reduction. Factor analysis is used for identifying the number, nature, and importance of factors, comparing factor solutions for different groups, estimating scores on factors, and testing theories (Nunnally & Bernstein, 1994).

There are two major types of factor analysis: exploratory and confirmatory. In exploratory factor analysis, the data are described and summarized by grouping together related variables. The variables may or may not be selected with a particular purpose in mind. Exploratory factor analysis is commonly used in the early stages of research, when it provides a method for consolidating variables and generating hypotheses about underlying processes that affect the clustering of the variables. Confirmatory factor analysis is used in later stages of research for theory testing related to latent processes or to examine hypothesized differences in latent processes among groups of subjects. Confirmatory factor analysis is typically conducted with structural equation modeling, in which an investigator has complete control of designing the latent constructs and the relationship between latent constructs.

The raw data should be at or applicable to the interval level, such as the data obtained with Likert-type measures. Next, a number of assumptions relating to the sample, variables, and factors should be met. First, the sample size must be sufficiently large to avoid erroneous interpretations of random differences in the magnitude of correlation coefficients. As a rule of thumb, a minimum of five cases for each observed variable is recommended; however, Knapp and Brown (1995) reported that ratios as low as three subjects per variable may be acceptable. Others generally recommend that 100 to 200 cases is advisable (Nunnally & Bernstein, 1994).

Second, the observed variables need to vary. In other words, one category of responses for a single observed variable should not contain more than 90% of the responses for that specific variable. Third, there should be no obvious miscodes or outliers, as indicated in a review of the frequencies of the observed variables. Outliers among cases should be identified and their influence reduced either by transformation or by replacing the outlying value with a less extreme score. Fourth, the observed variables should be normally distributed, with no substantial evidence of skewness or kurtosis. For normality, Kline (2005) recommends absolute values for skewness less than 3 and absolute values of kurtosis less than 8. Fifth, there should be little, if any, missing data for each observed variable. Sixth, use scatterplots to determine if pairs of observed variables are linearly related. Seventh, instances of multicollinearity of the variables should be deleted. Multicollinearity can be tested using regression and testing for tolerance levels less than .10. Eighth, regression techniques can be used to identify influential cases by examining large Mahalanobis distances when all variables are included in the analysis. Ninth, there should be adequate factorability within the correlation matrix, which is indicated by several sizable correlations between pairs of variables that exceed .30. Thus, the correlation of variables within a factor should be higher with each other than with variables outside of the factor.

When planning for factor analysis, the first step is to identify a theoretical model that will guide the statistical model (Ferketich & Muller, 1990). The next step is to select the psychometric measurement model, either classic or neoclassic, that will reflect the nature of measurement error. The classic model assumes that all measurement errors are random and that all variances are unique to individual variables and not shared with other variables or factors. The neoclassic model recognizes both random and systematic measurement error, which may reflect common variance that is attributable to unmeasured or latent factors. The selection of the classic or neoclassic model influences whether the researcher chooses principal components analysis (classic) or common factor analysis (neoclassic; Ferketich & Muller).

Conceptually, common factor analysis is based on a reflector model, in which the latent construct drives the answers given to the items (observed variables) that make the model. For example, one's level of depression (the latent construct) drives the responses to items that reflect depression. In a graphic model, arrows representing factor loadings would be drawn going from the latent construct point to the items. In comparison, principal component analysis is based on a producer model, in which the subjects' responses to the items drive the latent construct. For example, responses to items on the chronic illness checklist drive the total score of the number of chronic illnesses (the latent construct). In a graphic model, arrows representing the factor loadings would be drawn from the items and point to a latent construct.

Mathematically speaking, factor analysis generates factors that are linear combinations of variables. The first step in factor analysis is factor extraction, which involves the removal of as much variance as possible through the successive creation of linear combinations that are either orthogonal (unrelated) or oblique (related) to previously created combinations. Other methods of factor extraction, which analyze common factor variance (i.e., variance that is shared with other variables), include the principal factors method, the alpha method, and the maximum likelihood method (Nunnally & Bernstein, 1994).

Various criteria have been used to determine how many factors account for a substantial amount of variance in the data set. The most important is that factors should be made up of items with primary factor loadings higher than .40 and without any secondary factor loadings higher than .30. Items should be removed if this is violated. Another useful tool is examining the residual correlation matrix. The residual correlation matrix is the difference between the correlation matrix of the sample and the implied correlation matrix created by the statistical program to fit the data. Good fitting factor solutions should have an average difference in residual correlations of more than .05. It is also important to review the factor correlation matrix when using oblique rotation, correlations between two factors by more than .60 are so highly correlated that they could represent a single factor. Another approach is to use a screen test to identify the number of factors above the elbow.

The first step in running any factor analysis is to determine the number of factors to be tested on the basis of logic, theory, or prior empirical evidence, and set the number of factors to be estimated. The next step is to test factor models with solutions of plus or minus two factors above or below the number of factors originally identified. For example, if four factors were originally hypothesized, then models from two to six factors should also be tested to verify the factor structures. Problematic items usually appear across the various factor solutions. Remove items with primary factor loadings of less than .40 or with secondary factor loadings of more than .30. Remove items one at a time and rerun the factor analyses with solutions for two to six factors after each item removal until a "clean" solution is identified. No factor should have less than two variables.

Factor extraction results in a factor matrix that shows the relationship between the original variables and the factors by means of factor loadings. The factor loadings, when squared, equal the variance in the variable accounted for by the factor. For all of the extracted factors, the sum of the squared loadings for a single variable across all factors represents the communality (shared variance) of that variable. The sum of a factor's squared loadings for all variables is equivalent to that factor's eigenvalue (Nunnally & Bernstein, 1994).

Factor rotation is commonly used when more than one factor emerges. Factor rotation involves the movement of the reference axes within the factor space so that the variables align with a single factor (Nunnally & Bernstein, 1994). Orthogonal rotation keeps the reference axes at right angles and results in factors that are uncorrelated. Orthogonal rotation is usually performed through a method known as varimax, but other methods (quartimax and equimax) are also available. Oblique rotation allows the reference axes to rotate into acute or oblique angles, thereby resulting in correlated factors (Nunnally & Bernstein). When oblique rotation is used, there are two resulting matrices: a pattern matrix that reveals partial regression coefficients between variables and factors, and a structure matrix that shows variable–factor correlations. The pattern matrix is easier to interpret. The recommended rotation technique is to use oblique rotation because this represents the correlation of factors that occur in real life (Fabrigar, Wegener, MacCallum, & Strahan, 1999).

Factors are interpreted by examining the pattern and magnitude of the factor loadings in the rotated factor matrix (orthogonal rotation) or pattern matrix (oblique rotation). Ideally, there are one or more marker variables, variables with a very high loading on one and only one factor (Nunnally & Bernstein, 1994), which can help in the interpretation and naming of factors. Replication of factor solutions in subsequent analyses with different populations gives increased credibility to the findings. Comparisons between factor-analytic solutions can be made by visual inspection of the factor loadings or by using formal statistical procedures, such as the computation of Cattell's salient similarity index and the use of confirmatory factor analysis (Gorsuch, 1983).

Christopher J. Burant
Jaclene A. Zauszniewski

FAILURE TO THRIVE (ADULT)

Adult failure to thrive (FTT) syndrome is defined as a lower-than-expected level of functioning associated with nutritional deficits, depressed mood state, and cognitive impairment (Newbern & Krowchuk, 1994; Verdery, 1996). Clinically, FTT has been used interchangeably with the terms cachexia, frailty, dwindling, nonspecific presentation of illness, and decompensation. Although it has been discussed primarily in relation to the elderly (Egbert, 1996), on the basis of the above definition, it is likely that the syndrome crosses age boundaries and exists in other chronically ill patient populations, for example, adults with multiple sclerosis, AIDS, or diabetes.

In the International Classification of Diseases, 10th Revision, FTT is most frequently classified as a pediatric diagnosis. In children, FTT is very broadly defined as deviation from an expected growth pattern in terms of norms for age and sex (Frank & Zeisel, 1988). Pediatric FTT is generally classified as organic, in which there is a known underlying medical condition; nonorganic, in which the causes are psychosocial; or mixed. Advances in pediatric research have also produced a theoretical framework in which malnutrition is of fundamental importance, either as a primary cause of FTT or a secondary symptom of a chronic illness.

On the basis of several years of clinical and research experience with the elderly, Verdery (1996) proposed two etiological factors for adult FTT. The first is that the syndrome may occur in response to an event that triggers a more rapid than normal rate of decline. The idea that a trigger event may be a precursor to FTT needs further investigation but it is intuitively believable from both a clinical and research perspective: an event could be physiological in nature (for example, a hip fracture), environmental (for example, a change in residence), psychological (for example, death of a spouse), or a combination of all three. Verdery's second proposition is that there are two categories of adult FTT. This first is primary adult FTT, where the reasons for the patient's decline are ambiguous or obscure. In secondary adult FTT, the reasons are diagnosable and potentially treatable and there is a wide range of possible underlying factors: (a) medical history and treatment, for example, immune function or polypharmacy; (b) psychological problems, primarily depression; (c) nutritional factors, including eating disorders; and (d) social and/or environmental factors such as isolation or alcohol intake. Although many of the factors in the secondary category of adult FTT have been investigated in relation to health behaviors and outcomes, few have been examined from within a theoretical framework of adult FTT; in part because, unlike pediatric FTT, there is no consensus on the critical concepts and their relationships, nor are there objective criteria that can be used to evaluate deviation from the norm.

There also is relatively little published research on adult FTT. Methodological approaches have varied and, without a dominant model of adult FTT, studies have used different definitions of the syndrome, as well as various defining criteria. In one of the earliest reported studies, Messert, Kurlanzik, and Thorning (1976) identified adult FTT through documentation of a cluster of symptoms in five adult patients diagnosed with neurological disorders (age range = 24–67 years, mean = 49 years). All of the patients had irreversible weight loss despite high caloric intake, wide variations in body temperature, decreased levels of consciousness, unexplained rapid development of decubitus ulcers, and sudden death. A second study examined the characteristics of 62 male patients admitted with a medical diagnosis of FTT (Osato, Stone, Phillips, & Winne, 1993), using retrospective chart review. The patients had a wide age range (37–104 years), an average of seven medical diagnoses, required an average of five medications, and 62% had low levels of serum albumin (<3.5 g/dL). A third study retrospectively examined the medical records of 82 elders admitted with a diagnosis of FTT (Berkman et al., 1986) and used factor analysis to group FTT factors into three categories: patient care management problems, functional problems, and patient coping problems. A fourth study followed 252 subjects for 2 years after new hip fracture (Fox, Hawkes, Magaziner, Zimmerman, & Hebel, 1996). Subjects were generally older (mean = 77 years) and FTT was defined as a decline in walking 6 to 12 months postfracture *after* subjects had achieved an initial gain in mobility. Results were mixed: those classified as FTT (n = 26) were significantly worse off than the "no decline" group in their cognitive decline, number of hospitalizations at 12 months, and self-reported health at 24 months. No statistically significant differences were found between the two groups on social interaction or depression scores, mortality, physician visits, or nursing home stays. A fifth study also used physical functioning as the primary characteristic of FFT and measured associated factors in 34 older adults admitted to rehabilitation therapy posthospitalization (Higgins & Daly, 2005). Findings indicated that participants with unexpectedly low physical functioning were older, had decreased serum albumin levels, depressed mood, and less likelihood of discharge home.

Adult FTT is *not* normal aging, the unavoidable result of chronic disease, or a synonym for the terminal stages of dying (Egbert, 1996). Although there is no universally accepted definition, it appears that adult, or geriatric, FTT is a multidimensional concept more accurately defined as a syndrome rather than a medical diagnosis. In fact, it is a particularly unhelpful diagnosis if it is used to provide a label for unspecified symptoms and, consequently, prompts a sense of fatalism in clinicians, patients, and/or family (Robertson & Montagnini, 2004; Rocchiccioli & Sanford, 2009). Rather, we need more measurement-oriented approaches that establish the syndrome's complex underlying factors and determine appropriate treatments.

Patricia A. Higgins

FAILURE TO THRIVE (CHILD)

Failure to thrive (FTT) is a term used to describe a deceleration in the growth pattern of an infant or child that is directly attributable to undernutrition (Steward, Ryan-Wenger, & Boyne, 2003). Typically, the deceleration is a growth deficit whereby the rate of the child's weight gain is below the 5th percentile for age, based on the National Center for Health Statistics standardized growth charts. Undernutrition, or caloric inadequacy, and thus a deceleration in a child's growth pattern, can occur because of any number of physiological reasons, such as nutrient malabsorption or transient weight loss due to acute illness. When a child's lack of weight gain is attributed to psychosocial factors and developmental concerns rather than organic or disease-related factors, the term FTT is used. Within the last few years, researchers have begun to refer to FTT as "faltering growth," because many connote the term FTT with the occurrence of maternal neglect or abuse; the term faltering growth does not hold the same negative connotations (Batchelor, 2008).

Traditionally, the FTT syndrome has been classified into two categories: organic and nonorganic. Although the term FTT is used in contemporary literature, most researchers agree that the classification is not so clear; especially because all cases of FTT have an organic etiology (i.e., undernutrition; Olsen et al., 2007).

FTT is a common problem of infancy and early childhood, and researchers have documented a dramatic increase in its incidence since the late 1970s. FTT is most common during infancy, when nutritional needs and growth are at their highest point.

FTT accounts for 3% to 5% of the annual admissions to pediatric hospitals and approximately 10% of growth failure seen in outpatient pediatrics (Schwartz, 2002). Infants with FTT typically present not only with growth failure, but also with developmental and cognitive delays and signs of emotional and physical deprivation, such as social unresponsiveness, a lack of interactive behaviors, and anorexia (Sullivan & Goulet, 2010).

Infant factors contributing to FTT include poor appetite regulation (e.g., not waking for feedings), weak suck, difficulty weaning to solid foods, sensory sensitivity, and poor oral-motor coordination (e.g., swallowing or chewing difficulties; Harris, 2010). Parental factors contributing to FTT include strategies to increase food intake, such as force-feeding or extending the period between feedings to ensure the child will be hungry. These strategies can exacerbate the problem and also result in increased anxiety in the parent/child dyad (Harris, 2010).

Infant nutrition has long been the focus of pediatric research. Holt (1897) was one of the first to describe marasmus, a significant infant nutrition problem, and a condition similar to the FTT syndrome described in contemporary literature. It was in 1915 that the term FTT was first used in the pediatric literature to describe rapid weight loss, listlessness, and subsequent death in institutionalized infants. In the early 1900s, the mortality rate for institutionalized infants was near 100%, and few realized the importance of environmental stimulation and social contact for infant growth and development. It was during this time that the first foster home care program for institutionalized marasmic infants was developed. The home care program involved the identification and training of families, by nurses, to care for the ill infants, and included a significant amount of nursing intervention to monitor the progress of the infants. Unfortunately, this early work was not recognized by the pediatric community, despite a 60% drop in the mortality rate of marasmic infants cared for in the foster homes.

It was not until 1945 that the concept of FTT captured the attention of the psychiatric and pediatric communities. In a classic study, Spitz (1945) described depression, growth failure, and malnutrition in 61 foundling home infants. He used the term hospitalism to describe the syndrome that he observed, and he proposed that a lack of emotional stimulation and the absence of a mother figure were the main contributors to infant growth failure. Spitz postulated that with adequate love, affection, and stimulation, the infants would grow. Researchers demonstrated weight gain in infants with hospitalism when stimulation and affection were provided. Thus, these findings provided a foundation for an FTT theoretical framework on the basis of maternal deprivation in institutionalized infants.

In the mid 1950s, a number of case reports were published in the psychiatric literature that documented depression, malnutrition, and growth failure in infants living in intact families. These case studies were the first to report feeding and interactional difficulties between the mothers and their infants. Feeding episodes for the mothers were anxiety-provoking, which led the mothers to decrease both the frequency of infant feedings as well as their contact with the infants. Ethnologists and child development experts began studying institutionalized and noninstitutionalized infants to further define the concepts of maternal deprivation and FTT. On the basis of several studies, researchers then concluded that decreased maternal contact directly lead to FTT in the infants. From these works, the maternal deprivation framework for FTT was established, and the mother's role in the infant's well-being became a central focus. Support for this framework grew, as data accumulated documenting the association between maternal neglect and FTT in infants.

The maternal deprivation framework dominated the literature until the late 1970s, when a transactional framework was developed to explain the psychosocial correlates of FTT. The transactional framework proposes that an infant's growth and development is contingent on the quality of parental care, the nature of parent and infant interactions, and the ecological conditions impinging on the family. Furthermore, the transactional model recognizes that the quality of the parent/infant interaction reflects infant characteristics as well as parent characteristics (Bithoney & Newberger, 1987). Historically, the emotional deprivation component of FTT has been investigated more than the nutritional deprivation component. Although FTT experts would agree that undernutrition is the primary biological insult, systematic studies investigating this element are lacking.

Nutritional deprivation again became the focus of FTT research in the early 1970s, when some researchers disputed the hypothesis that maternal deprivation was the principal cause of FTT. More recent evidence suggests that the environmental deprivation may occur before the undernutrition. Although the primary cause of FTT may never be fully understood, it is apparent that nutritional deficits are dependent on the environmental context in which they occur.

Nurse researchers developed the ecological model describing parent/child interactions, and the model is used to explain FTT (Barnard & Eyres, 1979; Lobo, Barnard, & Coombs, 1992). The ecological model focuses on the three major interaction components of the parent/child relationship: those of the child, the parent, and the environment. These interactions are synchronous and reciprocal. Barnard et al. (1989) emphasized the importance of the parent's and child's physical and emotional characteristics, as well as the supportive or nonsupportive nature of the environment in understanding the interactions.

Researchers have examined parent/child interactions by means of direct, structured observations during feeding and other situations, and have found that infants with FTT demonstrate more difficult behavior, are less vocal, exhibit negative affect, and display more gaze aversion than infants who are not failing to thrive (Harris, 2010; Lobo et al., 1992; Steward, 2001). Furthermore, parents of FTT infants are less able to determine their infants' needs, have shown a decreased ability to discriminate infant cues, and exhibit less social interactiveness with their infants when compared with parents of healthy infants (Harris, 2010; Steward, 2001). These studies support that interference with the reciprocal process of the parent/child relationship disturbs the opportunity to attain optimal growth and development.

Other researchers have examined postnatal factors, such as maternal breastfeeding difficulties (e.g., infections, low milk supply), infant fussiness, and poor infant suck, which contribute to undernutrition, and thus FTT (Emond, Drewett, Blair, & Emmet, 2007). Maternal depression and its' link to FTT have also been investigated, and researchers have found no relationship between the two (Drewett, Blair, Emmett, & Emond, 2004). However, it has been demonstrated that school-aged children who developed FTT in the first few months of infancy are shorter, weigh less, and have poorer intellectual outcomes than their counterparts who did not experience FTT (Black, Dubowitz, Krishnakumar, & Starr, 2007; Corbett & Drewett, 2004; Emond, Blair, Emmet, & Drewett, 2007). This underscores the importance of appropriate nutrition during infancy.

Because growth problems such as FTT in infancy place a child at significant risk for developmental delays into toddlerhood and school age, it is important to investigate the interactional problems between parents and their infants so that interventions aimed at improving interactions can begin.

Heidi V. Krowchuk

FALLS

Falls threaten the health, life, and independence of older adults. Approximately one third of older adults experience an unintentional fall to the ground (Adams, Dey, & Vickerie, 2007). Nearly 32% of those with injuries require assistance with daily activities at least 3 months after the fall (Schiller, Kramer, & Dey, 2007). Moreover, yearly health care costs to treat falls are $19 billion (Stevens, Corso, Finkelstein, & Miller, 2006).

Falls are preventable. The Nurse Quality Forum has identified falls as a nurse-sensitive outcome that is endorsed by the Joint Commission for the Accreditation of Hospitals. Providing financial incentive to implement effective fall prevention programs, Medicare will not pay for hospital expenses related to falls. The Centers for Disease Control has guidelines for the development and implementation of community-based fall programs and a compendium of interventions with sufficient research evidence to recommend their use.

In more than 30 years of research, environmental, physical, and pharmacologic risk factors for falls are well understood and have been used to design a comprehensive clinical assessment of fall risk. Clinically, this assessment is critical for identifying those at risk for falls and targeting interventions. Comprehensive assessment interventions with clinical follow-up reduced the risk of falls when direct care was provided but were not effective if the person was referred to their health care provider for follow-up or provided information about falls (Gates, Fisher, Cooke, Carter, & Lamb, 2008).

Risk factors for falls drove the development of other interventions. Reduction of environmental hazards emerged first because of the many diverse hazards associated with falls. On the basis of a meta-analysis of studies in community-living older adults, a reduction of home environmental hazards is not effective in reducing falls or their risk (Gillespie et al., 2009). Yet, these hazards have been included in many multifactorial interventions.

Recent Cochran reviews found that exercise interventions reduced falls in community-living older adults (Gillespie et al., 2009), but not consistently in extended care facilities(Cameron et al., 2010). In a meta-analysis of 44 randomized clinical trials (Sherrington et al., 2008), exercise reduced falls by 17%, but walking had no significant effect. Moreover, exercise had a larger effect in programs with greater frequency and duration. Exercise that challenged the balance control mechanisms had the largest effects. Tai chi is an exercise that significantly challenges motor skills and balance and has been found to prevent falls and reduce fall risk (Gillespie et al., 2009). In a large randomized clinical trial, tai chi significantly prevented falls and reduced their relative risk, even though classes were only once a week and local instructors taught different styles (Voukelatos, Cumming, Lord, & Rissel, 2007).

Multifactorial interventions were developed with the assumption that the more risks that are targeted, the greater the reduction of falls. Most of these interventions address environmental and personal risk factors but often include exercise. Those with an exercise component were the most effective although not appreciably better than exercise alone (Gillespie et al., 2009). Although most multifactorial interventions are not effective in the community (Gates et al., 2008; Gillespie et al., 2009), they reduced falls by 27% in hospitalized older adults (Cameron et al., 2010). In spite of this lack of research support, the Centers for Disease Control recommends that community fall prevention programs include exercise, education, medication, visual assessment and management, and reduction of home hazards.

Notwithstanding extensive falls research, strong explanatory theoretical models for fall prevention have not emerged. Clinically, comprehensive assessment for fall risk and targeted interventions are essential to high-quality health care (Tinetti, 2008). The diversity of the single and multiple fall prevention programs with research evidence of their effectiveness provides challenges to development of widely accepted and standardized clinical protocols. Successful implementation within specific types of clinical settings requires quality control and supporting resources. Large-scale multisite translational research of well-developed and standardized fall prevention programs is needed to determine the effectiveness, feasibility, and cost-effectiveness as they would be implemented in community and institutionally based settings without stricter research controls. The findings from this research are critical for health policy, public and private funding, and insurance benefits that support fall prevention programs and provide access to older adults, whose numbers are expected to increase significantly as the baby boomers move into older adulthood.

Beverly L. Roberts

FAMILY CAREGIVING AND THE SERIOUSLY MENTALLY ILL

Serious mental disorders are common in the United States and internationally. Approximately one in four adults suffers from a diagnosable mental disorder whereas approximately 1 in 17 people suffer from a serious mental illness according to the 2004 U.S. Census (2009; http://www.nimh.nih.gov/health/topics/statistics/index.shtml). Effective care of the mentally ill and their families requires early community intervention using a variety of integrated approaches including mental health and social service teams. Effective mental health treatment must encompass the sick individuals and their families and take into account the complex relationship between mental illness, unemployment, homelessness, drug addiction, and involvement in the criminal justice system.

The importance of alliance building between family caregivers, the mentally ill member, and the health care team was described by Kempe (1994). Families are continuing to ask health professionals to communicate with them in a reciprocal way (Rose, Mallinson, & Gerson, 2006). As mental health care continues to become more community based, the family is required to assume more responsibility and care of their mentally ill member, yet families are not getting the direction and support that is needed. Family caregiving for the mentally ill involves the family steadfastly assisting the mentally ill family member with basic physical and emotional needs as well as maintaining a positive relationship and environment that nurtures a sense of self and belonging and allows the mentally ill person to strive toward educational and vocational goals (Smith, Greenberg, & Seltzer, 2007). The roadblocks facing families attempting to care for their ill family member continues to be (1) laws, policies, and regulations affecting care; (2) attitudes of health care providers including psychiatrists and nurses; and (3) consumer misinformation and stigma.

From the 1960s through the 1990s, caregiving studies identified several negative issues such as burden and related stressor (Maurin & Boyd, 1990). Caregivers were identified as needing much social support. Brady and McCain (2005) summarized the family perspective regarding living with chronic schizophrenia through a literature review covering 1990 to 2005. She found that families experience stigma, lack of social support, lack of knowledge about the disease, and burden. Families expressed a need for a positive relationship with health care providers, which includes respect and nonjudgmental approaches. These studies also reported that families continue to experience difficulties with the mental health system and financial issues.

Since the 1990s, these burdensome issues continue to exist and many positive aspects have also been described (Lohrer, Lukens, & Thorning, 2007). It has now been concluded that health care professionals must develop the theoretical flexibility to accommodate the diverse situations that family caregivers face in caring for their ill member. Encouraging family caregivers to listen to the experiences of others in caregiving roles and then learn to think creatively about themselves and their experiences has been a strategy that is helpful (Doornbos, 2002).

The sibling perspective is growing as more families must continue to care for their mentally ill member once parents can no longer manage the responsibilities (Hatfield & Lefley, 2005). Siblings need assistance from health professionals to interact appropriately, assess behaviors, and address areas of reciprocity with their ill sibling. Health care professionals can assist siblings and other close caregivers by destigmatizing the experience by planning outreach resources for all family members (Lukens, Thorning, & Lohrer, 2004).

Chronic mental illness can affect the family in many ways, including changes in familiar roles, changes in the subsystem within the family, possible isolation of family members, increased need for problem-solving skills, and adjustments with adaptability to family role changes. Caregivers experience more distress as the number of tasks increase and the ill member is able to do less in meeting their own needs (Sheehy, 2010). The social support required is really a large affirming social network of support that includes professionals participating in the care of the mentally ill person.

Over the past 30 years, community-based and deinstitutionalized mental health care have been the most influential movement. A push model (Yip, 2006) was developed to summarize the problems associated with caregiving of the seriously mentally ill. The model describes members pushing to move the responsibility for mental health care to others. Community and institutional care becomes overloaded and pushes the family to assume more responsibility. There is a result of families feeling unreasonable demands or burden. Care is poorly coordinated as the institutional and community care systems become overloaded. Resulting issues include an increase in psychotic violence, public stigmatization, and poorly coordinated services.

The barriers to care are not deliberately blocked but are subtle and inadvertent. Most long-term mentally ill are eligible for social security disability. The amount provided, however, does not adequately meet their needs. They are forced to rely on family or community agencies to underwrite their monthly physical needs for housing, food, and clothing. This access problem is exacerbated when they are so dysfunctional they are not able to actively seek needed services and quality care.

In attempting to address more than the physical needs of the mentally ill and family caregiver, mental health professionals need to also focus on relationship-based care (Koloroutis, 2004). Nursing is accomplished by acting on the informed intention to care in meaningful and personal ways. A genuine and focused presence opens the health professional to hearing and responding appropriately to the needs of the mentally ill and the family caregiver. An appropriate caring model for the mental health professional should include specific values, actions, and behaviors that meet the needs of the mental health consumer.

Family caregivers have clearly identified what they desire in terms of care. They expect open communication with health professionals, a strong alliance with the health team, continuing information regarding the disease and resources available, which can come from groups or individuals, and sufficient reimbursement for mental illness from insurance providers.

More research on family caregivers of the mentally ill is still needed. Researchers need to provide a new direction that removes barriers to quality care. Long-standing barriers include mistaken public policy, insufficient health insurance coverage, financial issues, the attitudes and practices of health care providers, and the attitudes and preferences of health care consumers. One necessary research is to determine ways to convince the political system and health insurance providers to reimburse for mental health services in a sufficient way.

Families and their mentally ill member must cope with stress, powerlessness, physical health issues, financial problems, and the enormous burden borne by nonprofessionals attempting to provide care for the mentally ill. Meeting these needs is accomplished through research and the development of health care models that any mental health professional could implement within the caring context.

The politically active, National Alliance for the Mentally Ill, continues to be instrumental in moving legislation, research, managed care, and family-focused care into public debate to help families with a mentally ill member get the needed care.

Psychiatric nurses and related health professionals should assist and partner with a nonprofit voice like the National Alliance for the Mentally Ill to accelerate enhanced care available to families and their ill members.

Alice Kempe

FAMILY HEALTH

The importance of the family to the health of the family, individual family members, and communities is supported by the research and scholarship across several decades (Feetham, 2011). The family is described as the most important social context in which health and illness occur, illness is resolved, and as the primary unit for health. Health has been described as a criterion for family life and as one of the primary purposes of the family (Grzywacz & Ganong, 2009). How the family is defined determines the factors that will be examined to evaluate the health of individual family members and the family unit. However, no universal definition of family has been adopted by the legal and social systems, family scientists, or the clinical disciplines that work with or study families. In addition to the biological family, when examining health in the context of the family, the family can be defined as constituting a group of persons acting together to perform functions required for the survival, growth, safety, socialization, and health of the family members. Research on health has focused primarily at the level of the individual and has not addressed the interdependence between the health of the individual family members and the family (Feetham, 1999, 2011).

The health of the family and family members is considered a function of the family as is biological reproduction, emotional development, socialization, safety, and economic support. The family is a dynamic system that helps to maintain health, offers support to family members, affects health decisions, and attaches meaning to illness (Rolland, 1987; Pardeck & Yuen, 2001; Wright & Bell, 2009). The ability of families to meet their primary functions rests, at least in part, on the health of individual family members. For example, the state of family members' physical and mental health determines how and if family functions are met, such as the ability for employment, to consistently monitor the behavior of children, and to provide a safe environment. The health of the individuals and the family is essential to effective family interactions and relationships. Grzywacz and Ganong (2009) note that we determine the health of the family by how they respond to changes in the physical and mental health status of family members and how they function to prevent health problems.

The World Health Organization (WHO) sponsored an initiative to identify statistical indices of family and health by examining family research and policy across four approaches: demographic, epidemiological (medical), social, and economic. The WHO was not able to identify specific indices of family health because of the complexity of measurement and "that family health is more than the sum of health of individual family members" (WHO, 1976, p. 13) and therefore family health should apply to the sum of the states of health of the individual family members. Pardeck and Yuen (2001) further reported that family health is demonstrated by the development of, and continuous interaction among, the physical, mental, emotional, social, economic, cultural, and spiritual dimensions of the family, which results in the well-being of the family and its members. Researchers and scholars have not been consistent in building from the WHO work and its definitions, therefore limiting the contributions of the research of families in the ensuing decades (Feetham, 2011).

Factors influencing family health include (a) genetics, (b) physiological and psychological responses of individual family members,

(c) cultural influences, and (d) the physical, social, economic, and political environments, including resources. Researchers have shown that health and risk factors cluster in families because members often have similar diets, activity patterns, and behaviors, such as smoking and alcohol abuse as well as a common physical environment. Identification of health in families has focused on family interaction patterns, family problem solving, and patterns of responses to changes in the family system. These definitions and concepts of family health provide a framework for determining measurable outcomes of family health while also accounting for the diversity in family structure (Feetham, 1999, 2000, 2001).

In 2003, we entered the genomic era, with findings from genomic research and advances in genetic technologies requiring a reframing of how we think of the continuum of health and illness, and even the concept of disease. The ways in which diseases are categorized, and ultimately how they are treated and managed, are changing (Feetham & Thomson, 2006). No longer named by their symptoms (such as asthma), diseases will be more specifically identified by knowing the genetic and environmental causes leading to more focused treatments (Hamburg & Collins, 2010).These advances may affect the concept of family health. Individuals and families will be faced with reframing their concept and experience with diagnosis, treatment, and prevention to include the term “genetically linked” disorder, with the blurring of the boundary between health and illness (Feetham & Thomson, 2006). Genetic information may result in the need to extend the concept of “illness time” phases to include knowledge of a risk state, or in some cases, a nonsymptomatic phase with a knowledge of risk (Rolland & Williams, 2005; Street & Soldan, 1998). The risk state refers to the time before a statistical risk is known or acknowledged or the point in time when symptoms occur. The risk state may require interventions for individuals and families to respond to the increased awareness of risk, new genetic risk information, or even the earliest occurrence of symptoms. Families may need to accept increased surveillance, adhere to changes in health behaviors, or accept interventions that may potentially delay the onset or progression of the disease. A genomics context for the health of families can alter lifestyle and health behaviors, affect reproductive decision making, alter family relationships, and have familial implications.

Researchers have focused on family responses to specific illnesses resulting in a body of literature reporting that the interactions within the family system affect the health outcomes of family members. Research of family responses to illness in family members and the role of the family in adaptation to illness and recovery provides further evidence of the importance of family and the health of family members.

From the time of Florence Nightingale, nurses have been encouraged to consider family members as important for nursing care (Whall & Fawcett, 1991, p. 9). However, the interdependence and importance of health and the family is accepted in theory but is not evident in research. Although our knowledge of this relationship has increased, it has also been limited in that research continues to focus more on measures of the negative outcomes (e.g., depression) of illness and injury on the family and family members. This focus on the individual as the unit of measure, and conducting research of families with physical and/or mental pathology, less knowledge has been generated about health, how the family functions, and the strengths and resources of families responding to acute and chronic illness. Grzywacz and Ganong (2009) suggest that family research should result in knowledge and strategies for protecting and promoting health across the life span while distinguishing the interdependence of activities of family to the health of the family and individual family members. Effective interventions with families incorporate an understanding of what health means to individual family members and to the family as a unit, and how the environment influences their health actions. Intervention research needs to examine explanatory processes to determine how interventions work. Because the family is the primary social agent in the promotion of health and well-being, our knowledge of the family and its relationship to the health of its individual members is central to research related to health promotion and to families responding to risk information and experiencing illness and disability.

Because of limitations in the research of families, knowledge of the significance of family to the health of the family and family members has not translated to policy, practice in health care systems, and the education of health professionals. As a result, the family is not the context of care and the health care systems do not support the health of families. The translation of research of families requires interdisciplinary research and collaboration.

Suzanne Feetham

FATIGUE

Fatigue is a universal symptom associated with most acute and chronic illnesses. It also is a common complaint among otherwise healthy persons, and often is cited as one of the most prevalent presenting symptoms in primary care practices. Defining fatigue, however, has challenged scientists for years. No clear biological marker of fatigue has been identified and fatigue remains a perplexing symptom for all health care providers.

Not only was fatigue named one of the top four symptoms for study by an expert panel on symptom management convened by the National Institute of Nursing Research in the early 1990s, but recently, fatigue has been singled out as among the symptoms or health outcomes needing attention for standardized measurement in the recently released National Institutes of Health Roadmap for Research initiatives. Because nursing is centrally interested in symptoms and symptom management, fatigue is of major concern for nurse researchers and clinicians alike.

The North American Nursing Diagnosis Association (NANDA) defines fatigue as “An overwhelming sustained sense of exhaustion and decreased capacity for physical and mental work at usual level” (NANDA, 2003, p. 74). Although a number of nurse researchers have studied fatigue and offered various proposals for categorizing fatigue, most accept the NANDA definition of fatigue. An alternative view of fatigue as “the awareness of a decreased capacity for physical and/or mental activity due to an imbalance in the availability, utilization, and/or restoration of resources needed to perform an activity” (Aaronson et al., 1999) has also been proposed. This definition adds a generic understanding of potential causes of fatigue that may differ in different situations, to facilitate studying the mechanisms of fatigue in different clinical conditions. This addition also allows for a clearer conception of fatigue as a biobehavioral phenomenon.

With increased recognition of the importance of studying symptoms within nursing, more work on fatigue has emerged. Investigators and study participants have made distinctions between acute and chronic fatigue. These distinctions are similar to those put forth by Piper (1989), who identified acute fatigue as protective, linked to a single cause, of short duration with a rapid onset, perceived as normal, generally occurring in basically healthy persons with minimal impact on the person, and usually relieved by rest; whereas chronic fatigue is identified as being perceived as abnormal, having no known function or purpose, occurring in clinical populations, having many causes, not particularly related to exertion, persisting over time, having an insidious onset, not usually relieved by rest, and having a major impact on the person.

In the research and clinical literature, fatigue related to childbearing and fatigue related to cancer have received the most attention. Even these areas, however, remain largely understudied and poorly understood. Although fatigue has been studied in numerous chronic illnesses, such as AIDS, multiple sclerosis, and rheumatoid arthritis, cancer-related fatigue is somewhat unique in that it is often fatigue associated with the treatment for cancer (both radiation and chemotherapy) that is most troublesome in terms of distress to the individual. In fact, fatigue associated with cancer treatment has been cited as a major reason for prematurely discontinuing treatment.

Fatigue has also been consistently associated with fever and infectious processes, and one of the more puzzling manifestations of fatigue is what is currently called chronic fatigue syndrome (CFS). CFS is a diagnosis used for cases of severe and persistent fatigue for which no specific cause has been identified. Under varying names (e.g., neurasthenia, myalgic encephalomyelitis, postinfectious or postviral syndrome, and chronic fatigue immune disorder syndrome), a syndrome of unexplained, chronic, persistent fatigue has been documented in the literature since the late nineteenth century.

Difficulty in studying, understanding, and consequently, treating fatigue is largely due to its ubiquitous nature and the unknown, but likely multiple, causes of fatigue. Untangling the relationship between fatigue and depression, in particular, further confounds investigations of fatigue. Although fatigue is an identified symptom of depression, long-standing chronic fatigue, unrelated to an existing affective disorder, actually may precipitate depression.

A lack of consistent, valid, and reliable measures of fatigue also contribute to problems in studying and understanding fatigue. Early work focused on fatigue in the workplace and was conducted by industrial psychologists, hygienists, and the military. These measures focused on healthy individuals and fatigue experienced at the time of measurement. More recent concern about the debilitating and distressing health effects of fatigue in clinical populations has led to the development of other measures targeting fatigue in ill persons.

There are now a plethora of generic measures of fatigue, as well as a growing list of measures of fatigue in specific illnesses (e.g., cancer, AIDS). However, because there is no known biochemical test or marker for fatigue, and because fatigue is first and foremost a subjective symptom, these measures of fatigue generally rely on self-reports.

A major problem with so many different measures of fatigue is that each taps into a somewhat different aspect of fatigue and, consequently, it is not clear whether they are all measuring the same thing. Some focus on the emotional and cognitive expression of fatigue; others include the physical expression of fatigue. Some attempt to quantify the amount of fatigue; others include attention to how fatigue interferes with activities of daily living. When different measures of fatigue are used in different studies, it is difficult to know if discrepant findings are due to real substantive differences in fatigue, or simply to the differences in the measures. This dilemma, in part, is why the National Institutes of Health Roadmap for Research initiative, aimed at patient-reported outcomes, is concerned with identifying and standardizing self-report measures, including fatigue. Identifying a set of standardized measures of fatigue with strong psychometric properties that clearly address the different aspects of fatigue and its expression will go far in aiding future research on this elusive symptom.

There may well be many causes of fatigue and each may ultimately be traced to a specific disruption in the HPA axis, in the immune system, or in both. If so, then continued investigations into CFS, in particular, may lead to a better understanding of fatigue in other, more clearly diagnosed clinical problems. Until such work is done that also suggests specific treatments for fatigue, nursing intervention studies that target ameliorating fatigue in different clinical populations must continue. Although rest generally alleviates acute fatigue, there are currently no known methods to eliminate the fatigue that plagues persons with various chronic illnesses or those whose fatigue is secondary to the treatments for their chronic illness. With the use of standardized measures of fatigue, this is a fertile area for nursing research.

Lauren S. Aaronson

FEMINIST RESEARCH METHODOLOGY

Feminist research methodology is research about women, for women, and by women. Feminist principles are used as a guide for the conduction of such research. In a world that is gender traditional and stereotypical in nature, feminist research methodology provides different perspectives and ways to view and understand such a world. The experience is investigated and a person's lived experience in the context of social frameworks which influence that experience is paramount to understanding. At the base of feminist research methodology is the view that gender interacts with multiple factors to define situations and relationships. For example, career advancement cannot be simply viewed in the traditional male perspective because this excludes the experience of pregnant women attempting to advance in their careers amid a biased belief that they will quit when the baby is born or, at a minimum, be distracted in their work. A feminist researcher uses the philosophical underpinnings of feminism to confront these typical structured beliefs and assumptions that anyone, regardless of gender, can advance in a career if she or he just works hard.

Feminist research methodology initially came to nursing in a descriptive and explanatory form more than 20 years ago. It was described in terms of epistemology and methods, and was significant in relationship to nursing (Im, 2010). Since that time, feminist research methodology has advanced in nursing as a basis of feminist critique of nursing and research. Feminist nurse researchers began to explore women's experiences without any preconceived assumptions or beliefs about their experiences. This allowed researchers to be open to what the female experience was truly like, and then conduct systematic investigation of the area of interest. In health care–related research, feminist research methodology has raised awareness that traditional scientific methods are not as objective as once thought to be. Issues such as the exclusion of women in health care clinical trials and the bias such practice results in, has brought about some change in clinical research, but it continues to fall short of the needed change (Rosser, 2007). It remains crucial that feminist nurse researchers stay abreast of ongoing, rapid changes in the social context. For example, cardiac symptoms defined in earlier studies that were conducted on men, bypass not only the biophysical differences of women, but also ignore the societal stress women of today encounter in living within multiple roles of working and family/personal lives. Additionally, feminist research bears light on the work that women do (unpaid and paid) that is undervalued in terms of contribution to economical society (Sweetman, 2008). Circumstances such as when women's salaries are necessary to the family's survival, can also stir discontent and violence toward these women from their male counterparts. Theoretically, feminist research guides in exploration of contexts, reasons, and formal and informal structures that explain why women experience what they do. This places feminist research in the position to continually be evolving as society and women in society continue to change over time. Because of societal changes in the increasing number of women in the workforce, women in the workforce of the 1970s faced different challenges because of gender than do women in today's workforce.

Feminist researchers seek to understand women's experiences through use of methods they think will reveal appropriate outcomes for women. Although methods may include the use of interviews, questionnaires, surveys, and inventories, use of group discussions, participant observation, and storytelling are more empowering to women. Feminist research is not composed of one particular method, and use of qualitative research methods has grown considerably in feminist nursing research in the last 5 years (Im, 2010). Feminist researchers gravitate toward qualitative methods because of how these methods fit more cohesively with the philosophy of feminism. Feminist researchers typically use several methods, such as triangulation, to obtain the best picture of women's experiences.

There is evidence that feminist research methodology is evolving as society evolves. For example, some feminist nurse researchers are using feminist methodology to explore variances in class and ethnicity, as well as disabilities and sexual preference (Im, 2010). It is interactive, including the participant as part of the process. It is also nonhierarchical, thus confronting the traditional hierarchical medical field. Increased research with varying groups of women, such as women of different ethnicities and socioeconomic status, reflect the diversity among women themselves. Nurse researchers in particular are conducting an increasing number of feminist research methodology studies that engage female and male participants (Im, 2010). These studies identify differences in female and male experiences in health care.

Feminist nursing research methodology is now being used to explore many different aspects of women's experiences in health and illness. In one such example, nurse researchers used a feminist perspective to look at issues surrounding pain in women with cancer (Im & Chee, 2003). In particular, bias existing within health care is being targeted by feminist nurse researchers (Im, 2010). For example, feminist methodology could be used to explore discrimination that might occur in an underserved female population at a typical emergency department.

Despite feminist research methodology and the fit with women and health and illness, research using the methodology seems limited. Feminist researchers also face additional pressures as they attempt to conduct studies. Feminism often carries a somewhat negative connotation in society and feminist researchers may be thwarted in research attempts. Nurse researchers engaging in feminist methodology in health care may encounter conscious and unconscious research barriers following disclosure that the study is feminist based. Feminist nurse researchers must not be deterred by such barriers and seek to fully explore health care structures and systems that oppress women. There are numerous issues that could be brought to light should this methodology be used to explore these issues. An example of this is menopausal symptoms among women, which remains highly biomedical even in nursing research (Im, 2007).

The biopsychosocial model is the newly emerging approach to explore and explain how society and multiple organizational levels of society influence health outcomes (Borrell-Carrio, Suchman, & Epstein, 2004). The biopsychosocial model will continue to be in demand and aligns with feminist nursing research beliefs in putting the client at the center of the investigation and tailoring health knowledge to match client needs.

One of the basic tenets of feminist research is to not only provide opportunity for dialogue about experiences in health care for example, but also to find ways to change systems in health care for the improvement of women's health. This counters popular belief that feminist research methodology exists only to complain about unfairness rather than the purpose it serves it understanding, explaining, and changing current experiences of women.

Sara L. Campbell

FETAL MONITORING

Fetal assessment is part of the process of providing prenatal care. It involves early identification of real or potential problems and enables the achievement of the best possible obstetric outcomes. Fetal assessment involves low-tech and high-tech modalities such as fetal movement counting (kick counts), intermittent auscultation (IA), electronic fetal monitoring (EFM), nonstress tests, vibroacoustic stimulation, auscultated acceleration, contraction stress tests, amniotic fluid index, biophysical profiles, and Doppler velocimetry. The basis for all of these testing modalities is the evaluation of certain biophysical parameters related to the developmental and health-related patterns of fetal behavior in utero. Adequate uteroplacental function is necessary for these patterns of healthy behavior. Uteroplacental insufficiency has been shown to be the cause of at least two-thirds of antepartal fetal deaths (Gegor & Paine, 1992).

EFM will serve as the focal point for this discussion as it is the basic intervention used in fetal assessment. EFM, as an electronic data gathering and data processing device, was developed during the 1960s. By the end of the 1970s, almost all major obstetrical units had at least one monitor, and 70% of all women in labor in the United States were monitored (Bassett, 1996). In 2002, nearly 85% of approximately 4 million live births were assessed with monitoring, also known as *continuous cardiotocography* (Robinson & Nelson, 2008). In addition to its use in monitoring fetal status during labor, modifications of EFM have been developed for antepartal fetal assessment to determine optimal fetal development and diagnose conditions of actual or potential fetal compromise (e.g., nonstress test, contraction stress test, vibroacoustic stimulation, and biophysical profiles).

Controversies still continue over the appropriate place of EFM in obstetric care. It was introduced into clinical practice based on animal studies and became widely used, with no controlled assessment of its effectiveness in improving the outcome of delivery, particularly in reducing the rates of cerebral palsy and neurologic injury (Robinson & Nelson, 2008). It was supposed to provide more accurate fetal assessment with the accompanying prompt identification of fetal compromise. The National Institutes of Child Health and Human Development (NICHD) has periodically issued guidelines for the use of continuous cardiotocography/EFM in fetal assessment, the most recent was published in 2008 (http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2621055/, accessed May 17, 2010).

Schmidt and McCartney (2000) presented a thorough historical review and discussion of the development of fetal heart rate assessment. They found that expectations of the benefits of EFM exceeded and preceded research on outcomes, efficacy, and safety. As knowledge accumulated through research and practice, the theories of correlation of causation and intrapartal events have changed. What were once considered to be significant intrapartal events cannot now be linked as conclusively to brain damage in neonates. Current research and improvements continue to report the benefits of EFM: a decrease in neonatal seizures and decreased operative intervention for fetal distress, with improved analysis.

The major problem is still the risk of misinterpretation of the EFM tracing. Schmidt and McCartney (2000) included study results in which, with a reassuring pattern, EFM can be a sensitive tool for identifying the well-oxygenated fetus. However, it is not a specific tool for identifying the compromised fetus when a nonreassuring pattern is seen. Current concerns are focused on the best ways to prevent or reduce the inappropriate use of EFM and develop the best ways to assess and monitor fetal development and safety in labor. Use of the NICHD guidelines should resolve this problem.

McCartney (2000) discussed the proposed benefits of automated EFM assessment (computer analysis): it is objective, standardized, and reproducible. She discusses the use of artificial intelligence and how it may prove to be of great value along with smart monitors and electronic databases in improving the interpretation of EFM. Porter (2000) reported that in May 2000, the use of fetal pulse oximetry has been approved by the FDA for clinical use to provide more information about fetal oxygen status, especially in cases of nonreassuring fetal heart rate patterns.

The American College of Obstetricians and Gynecologists (2009) and the Association of Women's Health, Obstetrical, and Neonatal Nurses (AWHONN), in cooperation with the NICHD, have developed standards and guidelines for practice concerning fetal assessment and the use of EFM and other modalities of fetal heart rate assessment. These new guidelines outline a three-tier, simplified categorization and interpretation of fetal heart rate tracings. Category 1 describes normal tracings, category II describes indeterminate tracings, and category III describes abnormal tracings (Robinson & Nelson, 2008). The presence or absence of fetal acidemia is the significant factor (Robinson & Nelson, 2008). Additionally, AWHONN position papers call for these standards of practice to determine the accepted conduct of antepartal and intrapartal care and provide the core of safe practice. It is the responsibility of all nursing and medical health care providers to be proficient in the use and interpretation of EFM and other intervention modalities used in perinatal health care delivery. Other recommendations include using EFM as a diagnostic rather than a screening tool and not as a substitute for supportive health care personnel. Additionally, specific indications, such as oxytocin induction or augmentation of labor, abnormal fetal heart rate by auscultation, twin gestation, hypertension or preeclampsia, dysfunctional labor, meconium staining, vaginal breech delivery, diabetes, or prematurity, as noted by Smith, Ruffin, and Green (1993), are still applicable. A major change is the recommendation that the terms "hyperstimulation" and "hypercontractility" have no meaning and should be abandoned (2008 NICHD update).

Haggerty (1999) presented an extensive overview of the reliability, validity, and efficacy of EFM. Her work looks at both sides of the controversy and includes the recommendations of the American College of Obstetricians and Gynecologists, the United States Preventive Services Task Force (1996), and the AWHONN that both EFM and IA have a place in fetal monitoring. Feinstein (2000) also researched the efficacy of IA, especially with low-risk pregnant women. Miltner (2002) concluded that integrating supportive care provided by labor nurses with other direct and indirect care interventions (such as monitoring modalities) may offer the best model for providing high-quality intrapartum nursing care. The previous findings are supported in more recent research conclusions.

Further prospective studies should be conducted to try to determine the optimal balance of intermittent or continuous EFM and auscultation and the other modalities of fetal assessment and pregnancy management. Rigorous study protocols and close attention to the principles of scientific inquiry are needed so that study results will be reliable and valid. The major concerns of perinatal care should be optimal and cost-effective outcomes for mother and infant, without concern for protection of the caregiver from litigious actions.

Susan M. Miovech

FEVER/FEBRILE RESPONSE

Fever is an abnormally high body temperature that occurs as part of a host response to *pyrogens* (fever producers). An alternate term for fever is *pyrexia*, with *hyperpyrexia* referring to high fever. It is misleading to define fever simply in terms of temperature elevation, however, because it emphasizes only the *thermal* manifestations of the nonspecific systemic host defense called the *acute phase response*. Acute phase response is triggered by endogenous release of *cytokines*, including interleukin-1, interleukin-6, and tumor necrosis factor that cause a cascade of biochemical events, autonomic reactions, and immune responses including heat generation. Some promote immunostimulant properties against infectious disease and tumors (Holtzclaw, 2002).

Pyrogens readjust hypothalamic regulatory centers to a higher set-point range, so that body temperature is maintained at higher levels. In true fever, other cytokines, hormones, and endogenously produced biochemicals act as *cryogens* with antipyretic properties that limit temperature elevation in fever. Controlled temperature elevation and intact thermoregulatory function differentiate fever from *hyperthermia*, a potentially lethal condition in which unregulated thermoregulatory function can produce neurologically damaging high temperatures. Fever occurs in three phases, reflecting the rise and fall of circulating pyrogens. Initially, the *chill phase* occurs when thermostatic mechanisms are activated to raise body temperature to the newly elevated set-point range. Vasoconstriction decreases skin perfusion, conserving heat but making skin feel cold. Shivering generates heat and is stimulated by sensory inputs that detect discrepancies between existing temperatures and the new set point. The *plateau phase* follows when body temperature rises to the new set point and warming responses cease. Finally, falling pyrogen levels lead to the *defervescence phase*, with diaphoresis and vasodilation.

Nurses have managed fever throughout history, yet the scientific evidence supporting care decisions is relatively recent. The lag between basic research findings and clinical application is documented in the absence of evidence-based hospital protocols and the lack of consensus among nurses in some setting for appropriate fever management approaches (Thompson, Kirkness, & Mitchell, 2007). Reluctance of many nurses to change methods of care is often seated in misunderstanding. Early traditions of cooling febrile patients were empirically based on the limited state of scientific knowledge and the erroneous fear that elevated body temperature was the cause, rather than the result, of febrile illness. Intervention was therefore geared toward lowering body temperature. Current knowledge confirms that fever is the host response to illness or invasion. Cooling the body is counterproductive, distressful to patients, and may cause compensatory overwarming. Evidence of fever's host benefits led investigators to focus on methods to reduce distressful febrile symptoms rather than reducing temperature. *Febrile shivering* is among the most distressful and energy-consuming symptoms of fever, particularly in immunosuppressed patients with opportunistic infections or those receiving antigenic drugs or blood products. Vigorous shivering is sometimes described by patients as "bone shaking." Nonpharmacological nursing interventions are based primarily on thermoregulatory dynamics to (a) insulate thermosensitive areas of skin from cooling to reduce shivering, (b) facilitate heat loss from less thermosensitive regions without chilling, and (c) restore fluid volume and improve capillary blood flow to skin. Fear of neural damage due to protein denaturation during high fevers is justified at temperatures of more than 42°C. However, true fevers are usually self-limiting and remain well below this level. Body temperatures of about 39°C may have added immunostimulant and antimicrobial effects. These features make *comfort* the primary reason for treating low-grade fever with antipyretic drugs. Higher set-point levels raise sensitivity to heat loss, causing even mild cooling to stimulate shivering. Aggressive cooling with conductive cooling blankets and ice packs evokes vigorous shivering, raising energy expenditure three to five times the resting values. As the consistent clinical observer of patient body temperatures, nurses find that issues of measurement, febrile patterns, physiological correlates, and sensory responses are of significance to practice and research.

Febrile symptoms are nonspecific responses to both infectious and host defense activities so that many symptoms and interventions are generalizable. Contrasted with studies of fever management in other disciplines that center primarily on pharmacological control of underlying infection, nursing research focuses on symptom management of fever responses regardless of etiology. Nurse researchers began studying interventions in the early 1970s to cool the body during fever without causing shivering or temperature "drift." By the late 1980s, concern grew about the metabolic and cardiorespiratory effects of fever on vulnerable patients with cancer or HIV infection (Holtzclaw, 1998b). The "set point" theory of temperature regulation was central to these intervention studies, but as discoveries of the 1990s identified and clarified mechanisms of endogenous pyrogens, cytokines and other biological messengers offered new measurable biomarkers of fever as a host response. Nurse scientists contributed significant scientific information about the febrile response using human and animal models (McCarthy, Murray, Galagan, Gern, & Hutson, 1998; Richmond, 2001; Rowsey, Metzger, Carlson, & Gordon, 2009)

Responsible nursing research on fever draws on principles from physiology, physics, biochemistry, and psychoneuroimmunology. It is often interdisciplinary and diverse in nature, varying from laboratory studies of humans and animals to clinical studies in hospitals and homes. Circadian variations in temperature are well documented (Bailey & Heitkemper, 2001), but there are few recent studies which confirm that daily temperature screening in hospitals adequately detect fever in persons with abnormal cytokine expression, such as those with HIV/AIDS. A study of febrile symptom management in patients with cancer tested interventions to suppress drug-induced febrile shivering (Holtzclaw, 1990) showed that insulating thermosensitive skin regions during the chill phase of fever not only reduced shivering but improved comfort. This preliminary work provided the basis for a comprehensive febrile symptoms management protocol, tested in hospitalized and home care HIV-infected persons with febrile illness (Holtzclaw, 1998a). In a controlled trial, the intervention of insulative coverings to suppress shivering was shown to be an effective intervention. Body water loss and dehydration were monitored by body weight, serum osmolality, and urine specific gravity in hospitalized patients, whereas a fever diary and home visits reported changes in patients at home. No patients with insulative wraps shivered, whereas controls experienced both shivering and higher peak temperatures. Systematic oral fluid replacement was not effective in replacing loss despite metabolic, cardiorespiratory, and fever-related fluid expenditures because fever suppressed thirst. Findings documented the negative effects of fever on hydration and febrile shivering on cardiorespiratory effort. Higher fatigue levels, lower thermal comfort, higher rate pressure product and respiratory rate were experienced by those in the control group who shivered. A growing awareness that cooling measures exert distressful and sometimes harmful effects has stimulated inquiry surrounding procedures commonly used to "cool" patients. The practice of sponge bathing with tepid water to cool down febrile (38.9°C) children was studied in a group of 20 children, ages 5 to 68 months, seen in an emergency room and randomly assigned to acetaminophen alone or acetaminophen with sponge bathing (Sharber, 1997). Although the sponge-bathed children cooled faster during the first hour, rapid cooling evoked higher distress and no significant temperature difference between groups over the 2-hour study period. There is evidence that a gradual, less drastic reduction in body temperature evokes fewer adverse responses during aggressive fever treatment with cooling blankets. Warmer settings effectively lower body temperature as well as cooler levels, without inducing shivering (Caruso, Hadley, Shukla, Frame, & Khoury, 1992). Two studies demonstrate that in comparisons of sponge baths, hypothermia cooling blankets, and acetaminophen (Morgan, 1990) and of cooling blankets versus acetaminophen (Henker et al., 2001), no temperature-lowering advantage was seen in the physical cooling treatment, which required more nursing time, caused shivering, and was distressful.

Today's nurse scientist is prepared to investigate many of the questions that remain unanswered in fever care. As investigators acquire skills and resources for these biological measurements, they can be used to quantify and qualify the effects of fever and results of intervention. Research is needed to demonstrate the effects of elevated body temperature, cooling interventions, and measures to support natural temperature-stabilizing mechanisms. Fever may provide study variables, with body temperature, cytokines, and biochemical correlates being the outcome of interest. The febrile episode itself may be the *context* of other questions for study. Psychoneuroimmunological factors surrounding sleep, irritability, and tolerance of febrile symptoms remain untapped topics. Likewise, the metabolic toll of fever on nutritional variables, effects of intravenous fluid on endogenous antipyresis, and measures of energy expenditure are important, but relatively untouched, areas of research for nursing. In contrast with the increasing opportunities for nursing research in the study of fever and its management, there remains a persistent lag in the application of what is already known (Thompson, 2005). One potential for improving application is seen in research efforts of nurses in neuroscience, an area in which fever management is critical, to assess fever management practices (Thompson, Kirkness, & Mitchell, 2007; Thompson, Kirkness, Mitchell, & Webb, 2007; Thompson, Tkacs, Saatman, Raghupathi, & McIntosh, 2003). As in many specialty organizations in nursing, the consciousness-raising dissemination of evidence-based practical knowledge may be effective in fever management.

Barbara J. Holtzclaw

FITZPATRICK'S RHYTHM MODEL

Fitzpatrick (1989) presented a rhythm model for the field of inquiry for nursing. Meaning is viewed as the central component of the human experience and is necessary to enhance and maintain life. Fitzpatrick incorporated Rogers's (1983) postulated correlates of human development as the basis for differentiating, organizing, and ordering life's reality. Rogers's correlates of shorter, higher frequency waves that manifest shorter rhythms and approach a seemingly continuous pattern serve as Fitzpatrick's foci for hypothesizing the existence of rhythmic patterns.

Occurring within the context of rhythmical person/environment interaction, Fitzpatrick identified indices of holistic human functioning as temporal, motion, consciousness, and perceptual patterns. Fitzpatrick has asserted that the four indices of human functioning are intricately related to health patterns throughout the life span, and these indices are rhythmic in nature. Fitzpatrick postulated the dynamic concepts of congruency, consistency, and integrity as complementary with rhythmic patterns. Fitzpatrick stated that health is a basic human dimension undergoing continuous development. She offered heightened awareness of the meaningfulness of life as an example of a more fully developed phase of human health. Nursing interventions were interpreted as facilitating the developmental process toward health so that individuals might develop their human potential. The meaningfulness of life is manifest through a series of life crisis experiences with potential for growth in one's meaning for living. According to Fitzpatrick, nursing's central concern is focused on the person in relation to the dimension of meaning within health.

Fitzpatrick's (1989) conceptualizations have been studied by graduate students in nursing at master's and doctoral levels. Studies of temporality among adult and elderly populations, psychiatric clients, pregnant adolescents, and terminally ill individuals provide a base for the existence of temporal patterns. Both younger and elderly groups have been addressed in investigating motion (Roberts & Fitzpatrick, 1983). Patterns of consciousness have been examined exclusively in older age groups (Floyd, 1982). Different types of perceptual patterns, for example, perceptions of color and music, have been investigated. Empirical support for the existence of nonlinear temporal patterns emerged from a number of research endeavors and helped to identify the need to generate questions about ways to measure the experience of time. A sense of timelessness was described as being characteristic of behaviors identified among the dying. Thompson and Fitzpatrick (2008) found that temporal orientation in a small, low-income, older adult sample was weighted more toward nonfuture dominance and nontemporal relatedness.

Pressler, Wells, and Hepworth (1993) investigated methodological issues relevant to very preterm infant outcomes based on the idea of the existence of microrhythms within some larger rhythmic pattern. Shiao (1993) studied perceptual patterns of low–birth weight infants in neonatal intensive care in relation to care interrupting breathing, oxygen saturation, and feeding rhythms. Several qualitative researchers have used Fitzpatrick's model, particularly in phenomenological studies in which participants' experiences were examined (see, e.g., Chiu, 1999; Cowan, 1995; Criddle, 1993; Montgomery, 2000; Moore, 1997).

Fitzpatrick (2008a, 2008b) describes meaningfulness in life as more focused on a present orientation. Thus, interventions focused on present life experiences can be expected to enhance higher levels of health and wellness. Fitzpatrick's rhythm model has the potential for inclusion in nursing research involving body rhythms; various aspect(s) of temporal, motion, consciousness, and perceptual patterns could be studied as part of coping with life events. Also, programs of research could be developed that relate the four patterns to well-being across the life span.

Jana L. Pressler
Kristen S. Montgomery

FORMAL NURSING LANGUAGES

The National Institute of Nursing Research Priority Expert Panel on Nursing Informatics (1993) defined nursing language as

> . . . the universe of written terms and their definition comprising nomenclature or thesauri that are used for purposes such as indexing, sorting, retrieving, and classifying varied nursing data in clinical records, in information systems (for care documentation and/or management), and in literature and research reports. . . . Determining the way that nursing data are represented in automated systems is tantamount in defining a language for nursing. (p. 31)

This report also differentiated between clinical terms, which represent the language of practice, and definition terms, which represent the language of nursing knowledge comprising theory and research. The distinction between language that supports practice versus language that supports theory and research is blurring as the state of the science in this area moves toward definitional, concept representations that can be processed by computer algorithms and shared among heterogeneous information systems (Hardiker, Bakken, Casey, & Hoy, 2002).

Research in standardized language to represent nursing concepts reflects four generations of inquiry: (a) development of organized collections of terms, (b) testing of nursing-specific and general health care terminologies to represent terms from nursing practice, (c) integration of nursing concepts into other health care terminologies using reference terminology models, and (d) context-specific organization of nursing concepts. Initial research on formal nursing language focused on the development of standardized coding and classification systems that represented the phenomena of clinical practice across care settings within the framework of the nursing minimum data set, comprising five data elements specific to nursing: (a) nursing diagnosis, (b) nursing interventions, (c) nursing outcomes, (d) intensity of care, and (e) unique RN provider number (Werley & Lang, 1988). This resulted in multiple nursing language systems including those that persist today: the North American Nursing Diagnosis Association International (NANDA International, 2008), the Nursing Interventions Classification (NIC; Dochterman & Bulechek, 2004), the Nursing Outcomes Classification (Moorhead, Johnson, & Maas, 2004), the Clinical Care Classification (formerly known as the Home Health Care Classification; Saba, 2007), and the Omaha System (Martin, 2004). Internationally, the development of the International Classification of Nursing Practice (ICNP) commenced (Clark & Lang, 1992) and has continued to mature (International Council of Nurses, 2010).

Testing of nursing-specific and more general languages for multiple clinical and research purposes by persons other than the developers followed. For example, Carter, Moorhead, McCloskey, and Bulechek (1995) demonstrated the usefulness of NIC in implementing clinical practice guidelines for pain management and pressure ulcer management. Parlocha and Henry (1998) reported the usefulness of the Home Health Care Classification for categorizing nursing care activities for home care patients with a diagnosis of major depressive disorder. Several studies demonstrated the capacity of the Omaha System to predict service utilization (Marek, 1996) and outcomes of care (Martin, Scheet, & Stegman, 1993). Moreover, instead of creating new terminologies from scratch, groups such as the Association of periOperative Registered Nurses (2008) adopted some terms from existing terminologies and augmented as needed for their specialty practice to create the Perioperative Nursing Data Set. Other investigators provided evidence that nursing terminologies were useful to retrospectively abstract and codify patient problems and nursing interventions from sources of research data such as care logs (Naylor, Bowles, & Brooten, 2000) or patient records (Holzemer et al., 1997). In another investigation, Holzemer et al. (2006) based the documentation of their nurse-delivered adherence intervention on the Home Health Care Classification to determine the dose of the nursing intervention in a randomized controlled trial (Bakken et al., 2005).

As confidence grew that the nursing-specific systems that had been developed reflected the domain of nursing and the drivers for multidisciplinary care and care systems grew, some investigators evaluated the extent to which terminologies not developed for nursing had utility for nursing practice. Several research studies examined whether or not standardized terminologies not designed specifically for nursing were useful for encoding nursing-relevant content such as diagnoses, interventions, goals, and outcomes. Henry, Holzemer, Reilly, and Campbell (1994) demonstrated that the Systematized Nomenclature of Human and Veterinary Medicine (SNOMED) was more comprehensive than NANDA to describe the problems of persons living with HIV/AIDS. Studies by Griffith and Robinson (1992, 1993) provided evidence that nurses perform many Current Procedural Terminology (CPT)–coded functions and that some functions are performed multiple times in a single day. In another study, Henry, Holzemer, Randell, Hsieh, and Miller (1997) compared the frequencies with which 21,366 nursing activity terms from multiple data sources (patient interviews, nurse interviews, intershift reports, and patient records) could be categorized using NIC and CPT codes and provided evidence for the superiority of NIC in representing nursing activity data.

Complementary to the research that was being conducted, the American Nurses Association played a significant policy role in “recognizing” language systems (Table 2) that met specific criteria related not only to utility for nursing but also to scientific rigor (McCormick et al., 1994). This process facilitated the inclusion of selected nursing terminologies into the Unified Medical Language System (Humphreys, Lindberg, Schoolman, & Barnett, 1998). The 2010 version of the Unified Medical Language System Metathesaurus (http://umlsks.nlm.nih.gov) includes the following terminologies recognized by the American Nurses Association: NANDA, NIC, Nursing Outcomes Classification, Clinical Care Classification, Omaha System, Perioperative Nursing Data Set, SNOMED Clinical Terms (CT), ICNP, and Logical Observation Identifiers, Names, and Codes (LOINC™).

In the third generation, with the increasing sophistication in terminological science and the need for data sharing across heterogeneous information systems, research transitioned from a focus on content coverage toward computable representations and the goal of semantic interoperability, that is, data collected in one information system using one terminology can be understood in another information system that uses a different terminology. This involved the development and testing of reference terminology models (Bakken et al., 2002; Hardiker, Casey, Coenen, & Konicek, 2006; Moss, Coenen, & Mills, 2003), a core component of a concept-oriented terminology, and integration of nursing-specific terminologies into large concept-oriented terminologies such as SNOMED CT (International Health Terminology Standards Development Organization, 2010) and LOINC (Matney, Bakken, & Huff, 2003).

Since the early 2000s, researchers have focused increased attention on formal languages in the context of other standardized and formal structures such as domain models, templates, documents, and electronic health records to decrease the ambiguity of meaning and increase the usefulness of the data recorded. Goossen et al. (2004) developed a provisional domain model for the nursing process for use within the Health Level 7 reference information model. Hyun et al. (2009) tested the utility of the Health Level 7—LOINC Clinical Document Ontology for representing nursing document names. Hoy, Hardiker, McNicoll, Westwell, and Bryans (2009) described the process of developing clinical nursing templates as a national resource and highlighted the need for international collaboration. Within the context of electronic health records, additional research focused on the development of a preliminary set of requirements centered on how structured data is presented to users for selection; how to mediate between a variety of conceptual structures including terminologies, information models, user interface models, and models of the clinical process; and how

Table 2

Standardized Terminologies With Utility for Nursing Care

Terminology	*Contents*	*ANA*	*UMLS*	*HL7*	*SNOMED*	*Availability*
Nursing-Specific						
Clinical Care Classification[1]	Nursing diagnoses, interventions, outcomes, goals	x	x	x	x	Public domain
International Classification of Nursing Practice	Nursing diagnoses, interventions, outcomes	x	x			Public domain
Omaha System	Problems, interventions, outcomes	x	x	x	x	Public domain
North American Nursing Diagnosis Association Taxonomy	Nursing diagnoses	x	x	x	x	License
Nursing Interventions Classification	Nursing interventions	x	x	x	x	License
Nursing Outcomes Classification	Patient/client outcomes	x	x	x	x	License
Patient Care Data Set	Patient problems, care goals, care orders	x	x	x		Only at Vanderbilt University
Perioperative Nursing Data Set	Nursing diagnoses, interventions, patient outcomes	x	x	x	x	License
Others						
Current Procedural Terminology Codes	Medical services			x		License
Logical Observation Identifiers, Names, and Codes	Vital signs, obstetric measurements, clinical assessment scales, research instruments, Nursing Management Minimum Data Set	x	x	x	Laboratory LOINC only	Copyrighted, but free for use
SNOMED Clinical Terms	MD/RN diagnoses, health care interventions, procedures, findings, substances, organisms, events	x	x	x	x	License

[1] Formerly the Home Health Care Classification.

ANA, Recognized by the American Nurses Association; UMLS, Included in Unified Medical Language System; HL7, Registered with Health Level 7; SNOMED, Included in SNOMED Clinical Terms.

to reuse modeling constructs (Hardiker & Bakken, 2004).

Over the last three decades, research related to formal nursing languages has evolved from naming and organizing the major concepts of the nursing domain to integrating nursing concepts into larger nursing-specific (e.g., ICNP) and health care terminologies (e.g., SNOMED CT and LOINC) to a focus on developing and testing of other formal conceptual structures for organizing collections of nursing concepts of various data types. The last is still in the formative stages but is essential for efficient and reliable integration of nursing concepts into computer-based systems in a manner that supports nursing practice as well as the reuse of concepts for practice-based generation of evidence and patient-centered outcomes research. Research on formal nursing languages provides a means toward using computer-based systems to achieve the ultimate outcomes of high-quality care delivery and improved health and quality of life.

Suzanne Bakken
Jeeyae Choi

FUNCTIONAL HEALTH PATTERNS

Functional health patterns (FHP) provide an organized framework for assessment that reflects the disciplinary perspective of nursing and integrates concepts linked to the focus of the discipline including health, caring, consciousness, mutual process, patterning, presence, and meaning as described by Newman, Smith, Pharris, and Jones (2008). The typology of the 11 FHPs identifies and defines each pattern under the following categories: (a) health perception–health management, (b) nutritional metabolic, (c) elimination, (d) activity–exercise, (e) cognitive–perceptual, (f) sleep–rest, (g) self-perception–self-concept, (h) role–relationship, (i) sexuality–reproductive, (j) coping–stress tolerance, and (k) value–belief (Gordon, 1994, 2010).

Rodgers (2006) states that nurses share the same values about persons in that they are whole, dynamic, relationship-centered, and complex beings with physical, emotional, spiritual, and social dimensions. The FHP assessment integrates these dimensions into each assessment and provides a structure to examine the whole person as well as behaviors and responses within each pattern over time. Subjective and objective data obtained during the assessment of each health pattern facilitate pattern construction for the individual, family, or community. Data from all 11 FHPs are assessed within the context of age and stage of development, culture and ethnic background, current health status, and environment. Each individual FHP reflects a unique response to a particular health/illness experience.

A health pattern may be described as functional, potentially dysfunctional, or dysfunctional. A FHP is both mutually exclusive and interactive, reflecting a holistic perspective. Often, data obtained about one pattern may be best understood in relation to information assessed in other patterns. Behaviors (cues) obtained during an FHP assessment can be used to generate and support a tentative nursing hypothesis (e.g., nursing diagnosis). To identify a clinical judgment (nursing diagnosis), data from all 11 functional patterns must be obtained and synthesized. Clinical judgments are described as a statement of probability rather than a causal statement. The more evidence that is obtained during assessment to support a clinical judgment, the greater the confidence in the judgment. The nurses' confidence in a judgment is enhanced by the amount of evidence provided by assessment data.

Historically, assessment tools were developed to evaluate and monitor clinical populations. Frequently, they duplicated information obtained by the medical teams. The lack of a consistent nursing assessment framework resulted in the collection of an inadequate database and limited the information available to make an accurate nursing judgment. This compromised nursing's visibility and contribution to patient care outcomes. The National League for Nursing was the first to support a movement away from nursing's task focus to one that was patient-centered and problem-based. Forty schools of nursing participated in a survey that generated a classification list of nursing's 21 problems (Abdellah, 1959). Later, in 1966, Henderson classified 14 basic needs related to patient care. This work focused on the identification of human needs, articulated nursing functions, and helped direct nursing care toward patient responses.

Gordon's (1994) typology of the 11 FHPs was informed by this work and provided nurses with a structure for organizing and documenting patient behavior over time. The FHP framework offered nurses a consistent framework for identifying human responses (nursing diagnoses) that resulted in the articulation of autonomous nursing interventions and evidence-based patient outcomes. This focus continues to be consistent with Nursing's Social Policy Statement (American Nurses Association, 2003).

The FHP framework provides nurses with an opportunity to know the patient in a unique way. Through a series of semi-structured interview questions (Gordon, 1994, 2010; Jones, 1986), each of the 11 FHPs is assessed as the individual's story unfolds. When additional information is required, the nurse uses branching questions to elicit new perceptions. This descriptive approach to data collection is then subjected to analysis in which data bits (or cues) are isolated and data are synthesized, leading to the formulation of tentative diagnostic statements that reflect phenomena of concern to nursing.

Internationally, use of the FHP framework as a structure for data collection, patient problem identification, and evaluation of care outcomes has grown. Investigations in many countries describe high-frequency nursing diagnoses and isolated patient responses to phenomena (e.g., eating disorders, sleep disturbances) and linked intervention strategies to specific nursing diagnoses. Others have used the FHP framework to validate cues associated with a particular nursing diagnosis. Nurses working in clinical specialties (e.g. ambulatory surgery, oncology, rehabilitation, and cardiovascular nursing) have used the FHP framework to identify patient responses (nursing diagnoses) throughout illness experience and recovery at home (Flanagan & Jones, 2009). Nurse administrators, using data from FHP assessments, reported that findings help predict nurse and patient mix, help identify patient problems, link nursing interventions with evidence-based outcomes, and ultimately help cost out care more accurately.

Nursing educators have used FHP assessment data to evaluate clinical reasoning skills and diagnostic accuracy (Levin, Lunney, & Krainovich-Miller, 2005; Lunney, 2008, 2010). Collectively, findings from this research continue to contribute to the refinement of a unified nursing language. Much of the ongoing work in this area is published in the *International Journal of Nursing Knowledge*, formerly the *International Journal of Nursing Terminologies and Classifications*.

Currently, research continues to test and refine a standardized assessment screening tool for use in research investigations. The FHP Assessment Screening Tool (FHPAST) originally developed by Barrett and Jones (1999) uses screening questions to evaluate each of the 11 FHPs. The original tool was modified from an 83-item tool to a reliable and valid three-factor, 57-item, patient-completed tool, with responses to each item organized on a 4-point Likert scale. The three factors are health risk/threat, general well-being and self confidence, and health promotion/protection, with α coefficients for each factor at .97, .93, and .78, respectively.

The tool provides a quantitative measure of the patient's functional health responses and identifies cues that can be used to guide further assessment by the nurse. To date, the FHPAST has been used in research in the United States and England in a variety of populations including healthy adults and those with chronic illnesses. The FHPAST has been translated into several languages including Portuguese, Spanish, and Japanese. The continued testing and refinement of the FHPAST will improve the use of a valid and reliable instrument to measure the patient's functional health over time.

Movement toward the use of a standardized nursing language and continued refinement of standardized nursing language classifications (NANDA, NIC, NOC, and the International Classification of Nursing Language) will promote the use of a consistent database for communicating nursing assessments, diagnoses, interventions, and outcomes across countries. The FHP framework offers a comprehensive approach to capturing human experiences of individuals and groups. Data from a standardized approach to nursing assessment using such a framework provide consistency and continuity to evaluating patients from a nursing perspective. The FHP assessment framework can help expand nursing knowledge, isolate human experiences in illness and wellness, promote creative interventions, and help articulate evidence that is nurse-sensitive.

Dorothy A. Jones
Jane Flanagan

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GENETICS

The genomic era of health care began in April 2003, with the completion of the sequencing of the human genome. The human genome uses four proteins: adenosine, cytosine, guanine, and thymine that replicate indefinitely. This double helix is the basis of DNA and, along with RNA, which substitutes uracil for thymine, makes up approximately 20 different amino acids. These amino acids regulate all bodily functions. Clinicians can determine the risks of transmitting heritable conditions to offspring and can use the principles of genetics to further understand complex multifactorial somatic conditions such as diabetes and heart disease. Nurses are expected to apply the core competencies (Consensus Panel on Genetic/Genomic Nursing Competencies, 2006) in all clinical settings. These competencies are relevant regardless of the educational preparation, clinical setting, or level of practice of the professional nurse

Nurses are key players in genetics and genomics research. Nurses are involved in biobehavioral clinical research, basic science research, and translational research in all areas of genetics and genomics. They also have been at the forefront of research that examines the ethical legal and social implications of the Human Genome Project. Nurses are principal investigators on dozens of NIH-funded studies in genetics research.

Nurses are involved in translating the implications of the genomic era of health care to patients and their families. They serve on scientific review committees designed to evaluate the state of the science and on institutional review boards to ensure that patients’ rights are duly protected. In addition, they are leaders in providing evidence-based personalized health care that recognizes the importance of genetics and genomics for individual health promotion while at the same time being careful that genomic information is placed in perspective with other individual, familial, and environmental attributes.

Judith A. Lewis

GRANDPARENTS RAISING GRANDCHILDREN

In the United States, there are 2.5 million grandparents who are responsible for the basic needs of the grandchildren who live with them (U.S. Census Bureau, 2008b). Of these caregivers, 1.6 million are grandmothers and 896,000 are grandfathers. According to the U.S. Census Bureau, an estimated 6 million or 8.4% of children live with nonparental relatives, a 173% increase since 1970 and a 78% increase since 1990 (U.S. Census Bureau, 2001). Nationally, there are an estimated 963,000 children younger than 18 years living under the primary care of grandparents, in parent-absent households (U.S. Census Bureau, 2005). This phenomenon impacts all racial and economic groups; however, African American and low-income grandparents are disproportionately represented (Bailey, Letiecq, & Porterfield, 2009; Minkler & Fuller-Thomson, 2005). Although children are raised by grandparents for a plethora of reasons, the most common include abandonment, neglect, substance abuse, incarceration, mental health issues, and HIV/AIDS (Kelley, Whitley, Sipe, & Yorker, 2000; Weber & Waldrop, 2000).

Although caregiver burden has been studied extensively with regard to caring for elderly parents, ailing spouses, and chronically ill children, caregiver burden among grandparents raising grandchildren has only been studied fairly recently. Researchers studying this phenomenon represent a variety of disciplines including nursing, sociology, gerontology, and psychology. Nurse researchers have made important contributions related to grandparents raising grandchildren, particularly with regard to their physical and emotional well-being (e.g., Caliandro & Hughes, 1998; Dowell, 2004; Musil & Ahmad, 2002; Kelley et al., 2000; Kelley, Whitley, & Sipe, 2007; Kelley, Whitley, & Campos, 2010; Musil, Warner, Zauszniewski, Wykle, & Standing, 2009).

Research findings reveal that raising grandchildren is associated with a negative impact on caregiver well-being, with numerous studies indicating that they are at an increased risk for poor health (Dowell, 2004; Hughes, Waite, LaPierre, & Luo, 2007; Minkler & Fuller-Thomson, 2005; Musil & Ahmad, 2002; Whitley, Kelley, & Sipe, 2001). Using both objective and subjective data, researchers studying 100 African American grandmothers found that almost one quarter were diagnosed with diabetes and high cholesterol, over one half were hypertensive, and over three quarters met criteria for obesity. When compared with the national normative sample, the participants self-reported significantly worse health. Musil and Ahmad (2002) had similar findings when comparing the health reports of 86 custodial grandmothers to grandmothers who had partial caregiver responsibilities as well as those with no caregiver role. Custodial caregivers reported worse self-assessed physical health than the other two groups. When examining caregiver burden in 104 custodial grandmothers, Dowdell (2004) found that 40% of participants self-reported their health as only fair or poor.

On the basis of a large nationally representative sample, researchers found that grandmothers raising grandchildren were more likely than noncaregiving grandmothers to report their health as either fair or poor (Fuller-Thomson & Minkler, 2000). These grandmothers were also more likely to report physical limitations when performing activities of daily living. In a prospective cohort study as part of the Nurses' Health Study, researchers found that providing high levels of care to grandchildren increased the risk of coronary heart disease (Lee, Colditz, Berkman, & Kawachi, 2003).

In addition to being at increased risk for health challenges, research findings indicate that custodial grandparents experience increased levels of psychological distress, including depression (Force, Botsford, Pisano, & Holbert, 2000; Fuller-Thomson & Minkler, 2000; Kelley et al., 2000; Musil et al., 2009). In a study of grandmothers with three levels of child care responsibilities, researchers found that primary caregiver grandmothers had more depressive symptoms than grandmothers who shared parenting in three generation households and those with no caregiver responsibilities (Musil et al., 2009). Primary caregivers also reported more intrafamily strain than the other groups. In another study, researchers found that nearly 30% of grandparents raising grandchildren had psychological distress scores in the clinical range, which is indicative of a need for professional mental health intervention (Kelley et al., 2000). Predictors of increased psychological distress in that study included lack of family resources, physical health status, and lack of social support. Using data from the National Survey of Families and Households, researchers found that, in comparison with noncustodial grandmothers, custodial grandmothers are more likely to have significantly higher levels of depressive symptomatology (Fuller-Thomson & Minkler, 2000).

Given the leading antecedents to being raised by grandparents (e.g., child maltreatment, abandonment, death or incarceration), it is not surprising that researchers have found increased behavior problems in children raised by grandparents when compared with national normative groups (Smith & Palmieri, 2007). Other research suggests that they may be at increased risk for developmental delays, often related to prenatal substance exposure (Whitley & Kelley, 2008). Undoubtedly, the increased demands of parenting children with behavioral problems and special needs contribute to the increased distress levels found in custodial grandparents. In one study, researchers found that grandparents raising special needs children reported poorer mental health than those raising children without special needs (Brown & Boyce-Mathis, 2000). Other studies have found that grandparents raising grandchildren with behavior problems experienced more distress than grandparents raising children without behavior problems (Hayslip, Emick, Henderson, & Elias, 2002; Pruchno & McKenney, 2002).

By assuming full-time parenting responsibilities, grandparents are often faced with increased financial pressures at or near a time in their lives when income is dramatically decreased. This decrease in income is often related to retirement and living on fixed incomes or from having to leave full-time employment because of the demands of full-time parenting, especially when the grandchildren have special needs. Although some families may be entitled to Temporary Assistance to Needy Families cash benefits, the monthly payments are typically nominal and insufficient for adequately housing, clothing, and feeding children.

Findings from several studies portray grandparent caregivers as socially isolated from peers because of the demands of raising children at a point in their lives when they would otherwise have few childcare responsibilities (Fuller-Thomson & Minkler, 2000; Kelley & Damato, 1995; Musil, 1998). The social isolation typically reported by grandparents raising grandchildren is significant, given that social support is a mediator of psychological distress in grandparents raising grandchildren (Kelley et al., 2000).

Although research has documented that grandparents raising grandchildren are at increased risk for compromised health and increased psychological distress, few studies related to interventions with this population are available. The majority of intervention literature is limited to descriptions of programs that lack outcome data or intervention studies with very small sample sizes (Dannison & Smith, 2003; Edwards & Sweeney, 2007; Kolomer, McCallion & Overeynder, 2003; Kopera-Frye, Wiscott, & Begovic, 2003). Furthermore, the majority of the interventions are limited to support groups and educational programs (Cox, 2002; Edwards & Sweeney, 2007; Hayslip, 2003; Kolomer et al., 2003; Kopera-Frye et al., 2003).

Several health-related intervention studies are available in the literature. Researchers conducted a pilot study to explore the impact of a group educational program on nutrition and physical activity knowledge of African American custodial grandparents (Kicklighter et al., 2007). Results indicated an increase in knowledge among participants; however, changes in behavior were not measured. Another study assessed the efficacy of an interdisciplinary, home-based intervention involving nurses and social workers, with the goal of improving the well-being of custodial grandmothers (Kelley et al., 2007). The researchers found improvements in the areas of psychological distress, resources, social support, and coping, but not physical health.

In a study involving 529 predominantly low-income custodial, African American grandmothers, researchers implemented a home-based intervention designed to improve the well-being of grandmother caregivers (Kelley et al., 2010). The intervention involved home visits by registered nurses and social workers as well as other support services over the course of a year. Results indicated significant improvements in a number of health attributes, including vitality, physical role functioning, emotional role functioning, and mental health.

Further research on the well-being of custodial grandparents is needed, including longitudinal studies to determine the long-term impact of this form of caregiving. Randomized clinical trials are required to identify intervention strategies that are effective in improving the health of this population. Policy-related research is necessary to address the impact of the 2010 federal health care reform legislation as well as the financial, social service, and housing needs of grandparents raising grandchildren.

Susan J. Kelley

GRANTSMANSHIP

Grantsmanship is the art behind the science. Although the focus here is on research grants, grantsmanship skills apply equally to writing grants to fund social and health programs and grants to fund training and education programs. Artful grantsmanship cannot make bad science or bad programs fundable, but poor grantsmanship can keep good science and good programs from receiving the favorable review needed to be funded. A sound programmatic or scientific plan is a necessary prerequisite for success in obtaining funding, but good grantsmanship is what makes it shine. As such, grantsmanship can be viewed as a type of salesmanship.

Everything a grant writer does to make the grant reviewer's job easier is part of good grantsmanship. Grant writers can become extremely immersed in their particular proposed project. This creates blind spots and the grant writer needs to constantly step back and remember that reviewers are not as invested in or as intimately familiar with their topic. Reviewers have competing responsibilities and priorities and greatly appreciate a well-written, clear proposal that flows logically and answers their questions before they have a chance to stumble on the question.

The grant writer wants to impress the reviewer with the soundness, importance, and creativity of the proposal. Among the major evaluative criteria for most grant applications, particularly ones submitted to federal funding agencies, is the significance and innovation of the proposed project. A good grant writer strives to stimulate an excitement that turns the reviewer into an advocate or enthusiastic champion of the proposed project. Achieving a balance between generating enthusiasm and adhering to somewhat rigid form requirements in writing grant applications is an artful enterprise.

Grant writing, itself, is not particularly creative. Rather, it may be viewed as a type of formula writing where good basic writing skills are essential. The grant writer cannot afford a lengthy, boring, or flowery introduction. Rather, the grant writer should grab the reviewer with the first sentences of the proposal. When it comes to grant writing, one never gets a second chance to make a good first impression. These first sentences should communicate the importance of the proposed project and quickly set the stage for the specific aims of the proposed project. The specific aims of a project are just the clear, specific goals that the investigator will accomplish with the proposed project. They are critical to and drive the rest of the proposal and application. The reviewer should have no questions about what the investigator intends after reading this first part of the proposal.

The grant writer also must methodically walk the reader/reviewer through a well-constructed logical argument and plan. The reviewer should be able to picture exactly what the investigator plans to do and how the investigator will do it. As previously said, a good grant writer anticipates reviewers' questions and answers them before the question is raised.

Repetition of important content is another key aspect of good grant writing. If it is an important point, it is worth repeating to ensure that a reviewer does not miss it. Repetition also is essential in the choice of words for key concepts. Once a concept is named and defined, the grant writer should stick with the identified word, term, or phrase. Altering a phase or using alternative terms to provide some variety only serves to confuse a reviewer trying to follow the specific ideas presented.

Good grantsmanship also requires a thick skin. Many more grant applications are written and submitted than are actually funded. A good grant writer will seek multiple reviews from colleagues before actually submitting a grant to the funding agency. It is wise to seek reviewers for a variety of purposes. Some reviewers should be familiar with the content area of the grant application to be able to identify important errors or gaps in content. Other reviewers should be unfamiliar with the specific content area to protect against assumed knowledge by insiders and to determine if the grant is written in a manner that convinces a knowledgeable but otherwise uninformed reviewer about the worthiness of the proposed project. Still others may be used for things such as grammar, editing, and typos not found by computer spell-checks. A thick skin is needed to request and receive a brutal review and to respond to all concerns and criticisms without defensiveness. Although we all like to hear the positives about our work, it is far better to hear from a colleague about the flaws and concerns raised by our proposal and to be able to revise the grant application accordingly than to have the very same concerns raised in the official review and result in a poor evaluation and no funding.

Although the specific proposal is the heart of the grant, good grantsmanship involves much more than just writing the actual proposal. The first cardinal rule in grant writing is to read and follow the directions. Although this seems simple enough, it is surprising how many would-be grant writers neglect to carefully read all instructions for a particular grant application and/or to follow them faithfully. Grant application directions are not suggestions; they must be followed exactly or risk rejection before going to review.

Most grant applications come with very specific guidelines about such things as who is eligible to apply, budget limits, allowable costs, page limits, margins, font sizes, section sequencing, type of content expected, number of references allowed, what may go in appendices (if allowed), who must sign where and what, and so forth. It is imperative that the grant writer adhere to all identified specifications. Some funding agencies return grants unreviewed if the directions are not followed. Moreover, not following directions raises questions about the careful attention to detail needed to carry out most projects and thus may reflect poorly on the applicant.

A second cardinal rule and basic element of good grantsmanship is to know and to understand the goals and mission of the particular funding agency to which one plans to submit the grant application. For example, each institute in the National Institutes of Health (NIH) has a specific mandate to fund certain types of research. Within these mandates, each institute sets priorities identifying specific areas in which they are seeking proposals. Similarly, foundations and other grant funders have specific missions and funding priorities. Before writing a grant application, one should investigate and determine what funding agency would be the best match for the intended project. Doing so also allows tailoring the proposal to the needs and desires of the funding agency.

The grant writer needs to convince the funding agency or foundation that the proposed project is exactly what they want to support and that it specifically addresses the funder’s stated priorities and goals. This is true for all grant applications. One helpful strategy is to use the exact language from the program announcement or the foundation's mission statement when describing the proposed plan. It is not in the grant writer's best interest to try to convince a foundation or other funding entity that they should want to fund a project not clearly within their mandate just because it is a worthwhile project.

Thus, the first challenge for all grant writers is to find the most appropriate funding agency, foundation, or professional organization for their proposed project. Although the NIH (http://www.nih.gov) is the major large funder of health-related research in the United States, other funding opportunities may be found at the following Web sites: http://fundingopps.cos.com, http://www.grantsnet.org, and http://fdncenter.org.

Finally, there are a number of references to assist grant writers, and several recent articles from the nursing literature are cited here. The NIH also has Web sites with helpful hints for grant writers. These can be accessed through Office of Extramural Research at the NIH at the following Web site: http://grants.nih.gov/grants/writing_application.htm. This Web site not only provides detailed information for writing grants, particularly those to be submitted to the NIH, but also has a direct link to grant writing tip sheets provided by different institutes throughout NIH.

Lauren S. Aaronson

GROUNDED THEORY

Grounded theory refers to a method of qualitative research that seeks to explain variations in social interactional and social structural problems and processes. The goal is to generate theory from the data and resultant conceptual schema. The grounded theory approach presumes the possibility of discovering fundamental patterns in all of social life, called *core variables* or *basic social processes*. According to its sociologist originators, Barney Glaser and Anselm Strauss (1967), grounded theories should be relevant and should work to explain, predict, and be modified by social phenomena under study. Data are not forced to fit existing theories but rather are used to develop rich, dense, and complex analytic frameworks.

Grounded theory as an original mode of inquiry oriented to the discovery of meaning emerged from the social philosophy of symbolic interactionism and an intellectual tradition in social science called pragmatism. Both emphasize (a) the importance of qualitative fieldwork in data collection to ground theory in reality, (b) the nature of experience as a process of continuous change, and (c) the interrelationships among conditions, interpretive meaning, and action. Knowledge is viewed as relative to particular contextual circumstances. Such a worldview was in contrast to the dominant paradigm that emphasized stability and regularities in social life.

Grounded theory, as a qualitative, nonmathematical analytic process, is particularly well suited to nursing studies that are conducted to uncover the nature of clinically relevant phenomena such as chronic illness, caregiving, and dying in real-world rather than laboratory conditions. The resulting theoretical formulation not only explains human experience and associated meanings but also can provide a basis for nursing intervention research and nursing practice.

The influence of grounded theory methods has been particularly striking in the evolution of nursing research because Glaser and Strauss, who developed the method, were professors in the School of Nursing at the University of California, San Francisco, starting in the 1960s. Consequently, many of the seminal methodological references and landmark publications of findings in the nursing literature can be traced to nursing doctoral students who studied and collaborated with them in the 1970s and 1980s. Subsequently, those early colleagues mentored several nurse researchers.

Grounded theories are focused on what may be unarticulated phenomena discovered through observation and interview data. The researcher does not begin with a preconceived theory and experimentally prove it. Rather, the researcher begins by studying an area under natural conditions. Data are usually derived from qualitative data sources—interviews, participant observation (fieldwork), and document analysis—although quantitative data can also inform the emerging analysis. Sensitizing questions are asked to learn what is relevant in the situation under study. Sampling is not conducted according to conventions of probability, nor is sample size predetermined. Instead, purposive, theoretical sampling is used so that concepts emerging from the data guide additional data collection.

Doing grounded theory research departs from the typically linear sequence of theory verifying research because data collection and analysis go on simultaneously. As soon as data are available, an orderly, rigorous, constant comparative method of data analysis is initiated. Analysis proceeds through stages of in vivo (or substantive) coding in which themes and patterns are identified in the words of participants themselves, coding for categories in which in vivo codes are clustered together in conceptual categories, and theoretical coding in which relationships among concepts are developed. Memos are written detailing each of the codes and categories and linking them to exemplars from the data. Concepts and propositions that emerge from the data direct subsequent data collection.

The sample is considered complete when saturation is achieved. Saturation refers to the point at which no new themes, patterns, or concepts appear in the data. Sorting memos (conceptual notes about codes and categories and their data exemplars) into an integrative schema provides an outline for integrating and then reporting the grounded theory discovered.

The outcome of analysis is a dense, parsimonious, integrative schema that explains most of the variation in a social psychological situation. Properties, dimensions, categories, strategies, and phases of the theory are inextricably related to the basic social process. Grounded theory may be context bound to a specific substantive area (substantive theory) or may be at a more conceptual level and applicable to diverse settings and experiences (formal theory; Glaser, 1978).

The grounded theory approach has resonated with a wide variety of social scientists and professional practitioners interested in human experiences with health and illness. In their book, *Discovery of Grounded Theory*, Glaser and Strauss (1967) acknowledged that it was a “beginning venture” and did not offer “clearcut procedures and definitions” (p. 1). Over time, grounded theory, as an approach to the generation of theory from data, has undergone some major transformations. Some of the changes that were designed to promote rigor in the method have been criticized as diverting the research from generating theory directly from data, for risking theoretical sensitivity in the investigator, and for eroding the method. Others are of the opinion that assuming that grounded theory was taught and conducted from a single unified perspective is erroneous and that the ongoing discourse among qualitative researchers is part of an intellectual movement essential to grounded theory’s refinement and evolution. The hallmarks, however, continue to be data–theory interplay, making constant comparisons, asking theoretically oriented questions, conceptual and theoretical coding, and developing a theory.

Holly Skodol Wilson
Sally A. Hutchinson
Updated by Deborah F. Lindell

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Health Conceptualization

The concept of health is a critical concept for nursing as it informs the profession’s goals, scope, and outcomes of practice. The goals of nursing are to restore, to maintain, and to promote health; the scope of nursing’s concern is with problems of health. When nursing practice assists people back to a healthy condition, successful outcomes are correctly declared. To be effective, nurses must have an understanding of health.

Health has been conceptualized in many ways in our society, including physical, emotional, mental, spiritual, and social well-being; what people in a culture value or desire; maximization of potential; high-level wellness; fulfillment of personal goals; successful performance of social roles; successful interaction with the environment; and proper functioning. Health has also been viewed as subjective or relative (self-report), objective (measured against an agreed-upon standard), comparative (a more-or-less condition viewed as a continuum or gradation), classificatory (a dichotomy), holistic (indivisible), a state (condition), and a process (continuous change over time). Thus, with such multiple, sometimes overlapping, often redundant, sometimes contradictory conceptions of health, the term has to be understood in terms of the purposes to which it is being applied.

What is the meaning of health for nursing science, that is, for human responses to actual and potential health problems? The concept of health has been dominated by two broad approaches: (a) descriptive analysis and (b) visioning the goals and practice of nursing for the future. In this context, the intention of the descriptive analysis is to understand the aims, goals, and criteria of success in current nursing practice. Investigators are trying to understand, systematize, and render coherent what nurses understand themselves to be doing and to clarify the different forms that disease or failures of health can take. Assessing the results of this approach amounts to determining which conception makes better sense of nursing practice and how the different parts of nursing practice fit together.

To most nursing clinicians and researchers, regardless of specialty area, the conception of health most applicable to practice is health as the absence of signs and symptoms of physiological malady and disability. Most nurses spend their careers observing, administering, modifying therapies, interpreting conditions, and treating people who are sick and need to be restored to health or teaching them how to stay free of those signs and symptoms. There are many theories that illustrate this approach. These include Florence Nightingale’s conceptualization of health as an innate process that could be influenced by education, lifestyle changes, and improvement of environment (Nightingale, 1860/1969). Smith’s (1981) clinical, role performance, and adaptive models of health also illustrate this approach as do the conceptual models, including the self-care framework (Orem, 2001). Orem identified health as the state of being whole and sound, where sound means strength and absence of disease and whole means nothing is missing. She conceptualized health as an outcome of self-care and as an influencing factor on both self-care agency and self-care demand. Finally, theories focused on stability, balance, and adaptation (e.g., Johnson, 1990; Roy & Andrews, 1999) also illustrate this approach clearly. Johnson (1959) identified health as a constantly moving equilibrium during the health change process, whereas Roy and Andrew's (1999) model of health emphasizes well-being rather than illness.

The second approach visions the goals and practice of nursing for the future. What currently passes for nursing is fundamentally inadequate; only by articulating a proper conception of health can we clearly explain what nurses should be doing. Assessing the results of this approach is much more difficult and controversial. In part, this is because some of the particular proposals reflect specific theories of human nature or philosophical orientations, like existential phenomenology, that have assessments that are a matter of dispute. In addition, these nondescriptive approaches disagree not only in their proposals for what nursing should be but also in what they identify as fundamentally wrong with current nursing practice.

Holistic theories of health are one type illustrating this second approach. Some of these are based on Rogers's (1994) science of unitary human beings. They are attempts to operationalize what Rogers meant by health as a state of continuous human evolution to ever higher levels. Examples are health as a process of becoming as experienced and described by the person (Parse, 1992) and as the totality of the life process, which is evolving toward expanded consciousness (Newman, 1990, 1994). In Fitzpatrick's life-perspective rhythm model, health is identified as a basic human dimension in continuous development (Pressler & Montgomery, 2005).

The concept of health as self-actualization is another type illustrating this approach, as in Smith's (1981; née Baigis) eudaimonistic model and Pender's (1996; Pender, Murdaugh, & Parsons, 2006) definition of health in her health promotion behavior model.

How are these theories applicable to practice? Within the context of these theories of health, there can be something wrong with a person although the standard clinical concepts are not at issue. There are cases in the second approach where success in practice has not been achieved, yet success in practice implicitly determines what health is. If someone does not have any signs and symptoms of malady or disability and is still not actualized, the nurse has not done her job. Does this make the nurse's job unbounded? Is the nurse being set up for burnout? Does nursing practically and theoretically want to claim that its domain covers all of the actual and potential health problems inherent in all of these meanings of health? The profession must be clear about what a health problem is so that it can determine who has the problem and who does not.

Nursing is not the only profession analyzing the idea of health. Much work is also being done in the philosophy of medicine, public health, and public policy. For example, some theories of health care allocation rest on specific conceptions of health and disease—why there might be a right to adequate health care but not necessarily a right to convenient transportation (e.g., having a car) gets explained in terms of the details of what is health and why it is important. Nursing researchers should try to integrate these concerns into current theories or at least explore common themes in this work.

Updated by Mary T. Quinn Griffin

HEALTH DISPARITIES IN RACIAL AND ETHNIC MINORITIES

The term health disparity has been widely used to refer to inequalities in health status and access. For example, the National Institutes of Health (NIH) defines health disparities as differences in the incidence, prevalence, mortality, and burden of diseases and other health conditions that exist among specific population groups in the United States (Keppel et al., 2005). Health disparities have been discussed in relation to health care access and quality, health status, burden of disease, and excess deaths (Carter-Pokras & Baquet, 2002). Health disparities in the United States have been associated with age, gender, income, educational level, sexual orientation, disability, geographic location, and racial and ethnic minority status. Similarly, inequities that refer to differences in health status and outcomes that are unjust, unfair, inhumane, unnecessary, and unacceptable express that difference unfairness or injustices (Hebert, Sisk, & Howell, 2008). Thus, a related term as opposed to health disparities is health equity. Recognizing that categories of inequities and inequalities are not mutually exclusive, the focus on this section will be on health disparities of racial and ethnic minority groups.

In the 1980s, the U.S. Department of Health and Human Services (DHHS) created the Task Force on Black and Minority Health. It was convened "in response to a national paradox of phenomenal scientific achievement and steady improvement in overall health status, while at the same time, persistent, significant health inequities exist for minority Americans" (U.S. DHHS, 1985, p. 2). The Task Force examined mortality data between minority groups and nonminority groups to determine excess deaths. Cancer, cardiovascular disease and stroke, cirrhosis, diabetes, homicide and unintentional injuries, and infant mortality accounted for more than 80% of the mortality among minority populations. President Clinton in 1998 focused attention on health disparities confronted by racial and ethnic minority groups, which were remarkably similar to those identified in 1985, with the exception of HIV/AIDS and pneumonia and influenza. Finally, the creation of the National Center for Minority Health and Health Disparities within the NIH helps to focus research priorities and resources toward eliminating health disparities.

Since that time, there have been numerous national policy initiatives to address health disparities. Healthy People 2000, for example, called for a reduction in health disparities, whereas Healthy People 2010 set as a national priority the elimination of health disparities among segments of the population that occur by gender, race or ethnicity, education or income, disability, geographic location, or sexual orientation (U.S. DHHS, 2000). Currently, the proposed objectives for Healthy People 2020 are under review. In addition to many of the health condition–related objectives in Healthy People 2010, a newer objective is focused on social determinants of health in which the "U.S. Department of Health and Human Services intends to develop objectives for the social determinants and ensure their integration across all Healthy People 2020 objectives" (U.S. DHHS, 2009).

Despite the improvement in overall health of the U.S. population, profound disparities in the burden of illness and mortality continue to be experienced by African Americans, Hispanics, American Indians, Alaska Natives, Asians, and Native Hawaiians and Pacific Islanders. The most striking of these disparities include shorter life expectancy, higher rates of infant mortality, cardiovascular disease, cancer, diabetes, stroke, sexually transmitted infections, and mental illness (Adler & Newman, 2002; Adler & Rehkopf, 2008; Murray et al., 2006). These disparities are believed to be a result of complex interactions among, social inequalities in income, educational opportunities, housing/environment, individual health behaviors, and biological factors.

Although there is no denying that health disparities exist for racial and ethnic minorities, the cause of disparities and therefore the design of appropriate strategies and interventions to eliminate disparities is the subject of many debates. Despite advances in medical technology and health care spending exceeding the amounts per capita of the GDP of many developing countries, overall health care quality and access remained unchanged or worsened for poor and racial and ethnic minority populations (2008 National Healthcare Quality and Disparities Report). The complexity in identifying the root cause of health disparities include several social factors (e.g., living in hazardous environments, limited educational opportunities, lack of employment, and linguistic and other cultural barriers; Adler & Newman, 2002; Adler & Rehkopf, 2008; LaVeist, 2005; Williams, Neighbors, & Jackson, 2008). In addition to societal barriers, additional barriers related to the health care system exist. These include barriers to access, differential treatment courses, biases and prejudices among consumers and providers, and institutional racism within the health care system as a whole, all of which disproportionately affect the health of poor and racial and ethnic minority populations (Jones, 2000; Smedley, Stith, & Nelson, 2003).

The challenge in addressing racial and ethnic disparities in health and health care is in part due to methodological concerns of measuring health disparities and consistency of language. For example, health indicators are usually measured in terms of rates, percentages, proportions, means, and other quantifiable measures, such as infant mortality (Keppel et al., 2005; Murray et al., 2006). Additionally, health disparities are typically measured from a specific point of reference or using models, such as demographic facts (e.g., age), individual behaviors, health indicators (e.g., Healthy People 2010), and health care system (Hebert et al., 2008; Keppel et al., 2005; LaVeist, Nuru-Jeter, & Jones, 2003).

Eliminating health disparities will require an understanding of not only health but also the social environment, political systems, norms, and policies, which impact the health of individuals, families, and communities. Frameworks grounded in critical social theory (Mohammed, 2006) and critical race theory (Delgado & Sefancic, 2001, as cited in Ford & Airhihenbuwa, 2010) have sought to address many of the structural means by which health disparities develop. Additionally, biological and other social theories have been proposed to further examine the disparate health outcomes between Whites and racial and ethnic minorities (e.g., Krieger, 2005), using frameworks that have examined psychosocial stressors (e.g., Williams & Mohammed, 2009), allostatic load, and "weathering" (Geronimus, Hicken, Keene, & Bound, 2006; Juster, McEwen, & Lupien, 2010).

The social determinants of health framework proposed by LaVeist provides a suitable lens in which to examine multiple theoretical frameworks that have been grouped together on a continuum across the life span. There has been an increasingly growing body of literature within the fields of sociology, psychology, and public health that are using social determinants of health as a framework to examine health disparities (LaVeist & Lebrun, 2010; Marmot & Bell, 2009; Smedley, 2006; Williams & Mohammed, 2009). As a result of consistent findings and worsening disparities in health among the poor and racial and ethnic minorities, there have been initiatives by the World Health Organization, the U.S. federal government, the federal and private funding agencies, such as the NIH, and the Robert Wood Johnson Foundation to make the elimination of health disparities a high priority.

Using social determinants of health as a framework in nursing research can be useful for extending existing nursing knowledge and care beyond the traditional nurse–client relationship because it assumes a holistic approach to examining the impact of socioenvironmental factors that contribute to health disparities, thus moving us from description of the conditions of individuals with disparate health, to making visible the social processes that contribute to them, and consequently engaging nurses to become advocates for change in health and social policies (Lynam et al., 2008).

The challenge for nurses in addressing racial and ethnic disparities in health and health care are many. Although not unique to nursing, there is an insufficient breadth and depth of nursing research with racial and ethnic minority populations that is adequate to guide practice. Certainly, the lack of research in this area is not unique to nursing. This issue is compounded by the limited racial and ethnic diversity within nursing.

It is critical that nurses increase their leadership and their knowledge by collaborating with other disciplines, with a mutual interest in eliminating health disparities among racial and ethnic minorities as well as other segments of the population. Recognizing the influence of social determinants on health and health care, acknowledging and working toward the elimination of institutional racism and discrimination in health care settings and schools, increasing the racial and ethnic diversity within the nursing workforce, and the need for true partnerships with racial and ethnic minority communities are several of the needed strategies needed to eliminate disparities.

Antonia M. Villarruel
Brandon N. Respress

HEALTH DISPARITIES: THEORETICAL AND METHODOLOGICAL APPROACHES

The 1948 United Nation's Universal Declaration of Human Rights set forth the right of all individuals to have "a standard of living adequate for health and well-being." However, when unacceptable global inequity in health status was recognized, the World Health Organization in 1978 set a goal of primary health care for all people by the year 2000. By 1985, the U.S. Department of Health and Human Services (DHHS, 2010a) began developing the 10-year Healthy People strategy for national health promotion and prevention to improve lives of the U.S. public. Using measurable health indicators, the Healthy People strategy advances two primary goals for the American public: (1) to improve length and quality of life and (2) to eliminate health disparities (DHHS, 2010b).

For 30 years, the Healthy People agenda has alerted the nation's health community about gaps in the provision of health care. Nonetheless, segments of the U.S. population continue to experience pervasive inequities in health care beyond poor access to care and financial inability to pay for health care and other services. Efforts exclusively focused on increasing technology and improving the quality of health care lack the capacity to offset societal gradients of age, gender, racial or ethnic differences, education, and socioeconomic status (SES; Barr, 2008; Gresenz, Rogowski, & Escarce, 2009). Mandated by congress since 1999, the most recent National Healthcare Disparities Report (Agency for Healthcare Research and Quality, 2009) once again described a continuing decline in health performance measures for minority and populations with low SES. As a remedy, the report urges particular attention to raising awareness of health disparities, training minority providers, and forming public–private partnerships to identify and test solutions to this dilemma (DHHS, 2010b). The future health of minority and low-income populations is the focus for improvement.

SES describes the interplay of income, education, and occupation (Barr, 2008). Socioeconomic insecurities, especially in neighborhoods with limited employment opportunities, lack of resources, and poor availability of health care services, exacerbate health inequities. As an example, a low-income, minority community lacking grocery stores that offer healthy and fresh food selections contributes to chronic obesity, a mounting problem for many Americans (Cyzman, Wierenga, & Sielawa, 2009; Sloane et al., 2006). Community-based action to reduce obesity calls for coordination of policy, resources, and innovative research to bring healthy solutions to such a neighborhood.

The 2000 U.S. Census Bureau forecasted a demographic transition to older age among U.S. born citizens and a mushrooming growth of minority populations by the year 2050. Racial stereotyping in clinical interactions and related sociocultural conditions, such as language differences and poor health literacy, seriously undermine equitable health care provision for minority populations (LaViest, 2005). A recent study confirms that health care providers perceived their care to racial or ethnic minorities as being less than that provided for white clients (Blendon et al., 2008). Thus, increasing minority health care professionals to reflect the diversity of the U.S. population is a strategy to improve the nation's health. Improved concordance of minority providers and patients has been associated with greater access to care, improved educational experiences, and better patient satisfaction among minority individuals (Smedley, Butler, & Bristow, 2004).

The landmark health legislation, called the *Affordable Care Act*, passed in 2010 under the direction of President Barack Obama, establishes a 5-year plan (2010–2015) to transform U.S. health care. The chief goals of the health care reform act emphasize affordable insurance coverage to the uninsured, advancement of science and innovation to benefit public health and health care provision, and enhancement of the safety and well-being of the American public through prevention and emergency response preparedness (DHHS, 2009). Continuing evaluation of health status indicators for all segments of the population will help to guide the course for such a challenging undertaking. The impact of health care reform on health disparities will only be clear over time, as evidenced by the amelioration of health status indicators and improved health performance measurements among those populations experiencing health disparities today.

In addition to those trying to advance health policy through government legislation, nurse researchers are contributing to the elimination of health disparities by incorporating the contexts of disparity in the theoretical frameworks that guide their research as well as the research methodologies they select to address the complex health needs of marginalized and underserved groups. Using community-based participatory research and participatory action research (PAR), qualitative methodologies, and feminist and environmental frameworks, nurse researchers are investigating the root causes of health disparities (Butterfield & Postma, 2009; Esperat, Feng, Owen, & Green, 2005; Etowa, Bernard, Oyinsan, & Clow, 2007; Kelly, 2009; Sullivan-Bolyai, Bova, & Harper, 2005; Walker, Sterling, Hoke, & Dearden, 2007).

As an example, Butterfield and Postma (2009) developed the translational environmental research in rural areas (TERRA) framework to investigate the environmental health risks affecting the rural poor. The TERRA framework locates environmental health risks within physical, economic, and cultural contexts to develop family-level interventions that positively influence rural public health. Knowledge developed through the TERRA framework stopped the use of chat, a toxic material, in construction and road projects.

The transformation for health framework integrates Freire's transformational framework with community-based participatory research to develop family-level interventions for childhood obesity in Latino communities (Esperat et al., 2005). The transformation for health interventions promotes the development of "critical consciousness" or an individual's deeper understanding of her realities. Interventions that encourage critical consciousness have the greatest impact because participants achieve a transformational power that leads them to action that is initiated by them and for which they claim ownership.

Aside from using theoretical approaches to guide research in health disparities, nurse researchers are engaging in refreshing methodological approaches. Etowa et al. (2007) used PAR to investigate health status and health care access among African Canadian women in rural Nova Scotia. The study used community research facilitators who were members of the communities where the research took place. Trained in every aspect of the PAR process, community facilitators ensured that study findings closely reflected the community's health concerns and they interacted sensitively with the public and with policy makers.

Health disparity research is expanding. Highlighting the perspectives of the community as a partner and training lay providers to overcome barriers to health care access and promote emotional support are in vogue (Balcazar et al., 2010; Nyamathi et al., 2011). Latest examples include the use of photovoice to capture shared perceptions of characteristics that influence the health and well-being of the community, followed by concept mapping, wherein active involvement of residents promotes the organization and building of consensus, leading to solutions in poor immigrant communities (Haque & Rosas, 2010). Use of creative arts with visual voices with African American youth is another example that informed researchers about issues related to environmental safety (Yonas et al., 2009).

Future direction needs to focus on adapting the latest innovations in PAR to understand more fully the many contextual issues that influence the health status of impoverished communities. For example, the ongoing use of PAR as well as the more innovative examples of studies that combine genetic sequencing with integration of participatory research methods results in building a consensus framework of health-affecting factors leading to improved health of a neighborhood. Moreover, engaging researchers to conduct pilot studies that bring together like-minded organizations to focus on education and training programs to improve community capacity can be a powerful strategy (Gwede et al., 2009). Such outcomes can more directly influence sustainable infrastructure and systematic assessment and attention to organizational complexities.

Advanced knowledge of genetics can have a dual effect. On one hand, such knowledge can broaden discrimination in communities of color by assigning erroneous genetic contributions to diseases without fully contemplating the systemic social contributions to health (Bonham et al., 2009). However, if genomics research would include longitudinal cohort studies that consider environmental exposures, lifestyle, and genetic risk factors among others, while integrating participatory action methodologies, a fuller visualization of health disparities might be appreciated.

This summarized research provides nurse researchers with viable frameworks and methodologies for addressing health inequities. Such frameworks consider the contexts and systems in which health inequities occur and provide opportunities for nurse researchers to take an active role in correcting health disparities. Collaborative research involvement is essential if the health of vulnerable populations is to equal that of the most privileged in our society.

Adey Nyamathi

HEALTH POLICY AND HEALTH SERVICE DELIVERY

Policy is a general statement of aims or goals that can be described at different levels of abstraction and can range in scope. They can serve as a broad guideline to a specific action. Policy encompasses choices that society as a whole, segments of society, or organizations make regarding their goals and priorities and reflect the values, attitudes, and beliefs of those designing the policy. A policy guides the allocation of resources that are used to attain the policy goals. Policy can be described as public, institutional, or organizational. Public policy is formulated, adopted, and implemented by the authorities in a political system often in the form of laws and regulations. Institutional policy governs workplaces and guides programs and procedures. Professional organizations, such as the American Nurses Association, adopts policies that are often n the form of position statements.

The World Health Organization (WHO, 2003) defines health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." Health service delivery encompasses activities that focus on health promotion and prevention of disease, treatment, and rehabilitation of individuals or populations in a variety of settings. WHO (2007) identifies health services delivery as one of the building blocks of a national health system. Other building blocks include human resources, information, medical products, technology, and financing. Inputs such as human resources and finances combine to the delivery of health services. The higher the degree of health service delivery integrated, the greater the continuity of care and the more efficient the organization of care is in attending to patient needs. Because efficiency gains have an upper limit, many would argue that there may be a trade-off with effectiveness that leads to vertical programs.

The WHO definition of health services delivery focuses on a national perspective. In thinking of health services delivery at a more local level, Donabedian's (1966) structure–process–outcome framework and system's theory can be used to examine the impact that health policies have on the health services delivery. In systems theory, elements inside and outside the system are open and interrelated. They interact, adapt, and are constrained and in need of feedback. Health service delivery is embedded within a health care system. The health care system interacts with a variety of outside elements, such as public entities that create laws and regulations impacting how health care systems should operate, be reimbursed, and measure quality and safety of care. Professional organizations set standards related to the education, practice, and work conditions for nurses.

Health service delivery can broadly be viewed as a pyramid of four broad services with population-based public health services at the base. Building from the base to the pyramid's peak are primary health care, secondary health care, and tertiary care services. Population-based public health services include health promotion and disease prevention activities at the community level, primary health services involve clinical preventive services and care for common medical conditions, secondary health care services have a focus on specialized care and include support services for people with chronic or long-term health problems, and tertiary services are provided in facilities. The use of the pyramid to represent health services implies that each level serves a different portion of the total population. Since the passage of Medicare and Medicaid in 1966, the U.S. health care delivery system has focused on services at the secondary and tertiary level. Health care delivery has occurred in silos, with each silo providing different levels of service.

Public policy, specifically the 2010 Patient Protection and Affordable Care Act, will change the U.S. health service delivery by shifting reimbursement from fee for services at the top of the pyramid to a more coordinated health service delivery model with threads of health promotion and disease prevention woven through all levels of delivery. The goal is to eliminate the silos and to have an integration of health delivery services. For example, a national voluntary pilot program for bundled payments will be developed by 2013. Under this program, services during one episode of care (for yet to be identified diagnoses) will be reimbursed in one payment. The Act defines an episode of care as the time period starting 3 days before hospital admission and ending 30 days after discharge, but the Secretary of the U.S. Department of Hunan Services has an option to change the time period for the pilot program. Services provided during an episode of care include primary care providers, hospitals, outpatient hospital services, emergency room services, postacute care services, and others as identified by the Secretary (Berenson & Zuckerman, 2010). In preparation for this change in public policy, hospitals are restructuring their health delivery models. They are integrating primary care providers into their systems and initiating use of electronic medical records. Medical homes are also emerging as a model for health service delivery. This model uses a team of providers to provide comprehensive, coordinated care that fosters a collaborative provider–patient relationship. It supports patient outreach and education, especially for patients with chronic conditions.

Some of the changes proposed in this legislation have occurred because of the evidence provided by nurse researchers and others on the value of prevention and health promotion. Nurse researchers have provided evidence on the effectiveness of nurse practitioners as primary care providers and coordinators of care. They have contributed to the body of knowledge on underuse of health services by people with lower incomes, lack of health insurance, and gender and racial differences. Some of this work has lead to a better understanding as to why health services are not used appropriately by specific groups of people. Moreover, findings from studies conducted by nurse researchers provide evidence of effective interventions for patients with chronic diseases, which are of high concern to policy makers. Almost 75% of U.S. health care dollars spent each year is on four chronic diseases: obesity, type 2 diabetes, heart disease, and cancer. Nurses are contributing to the evidence that these chronic diseases can be prevented, delayed, or alleviated and are building evidence-based interventions and services that focus on the patient’s behavioral change.

Nurse researchers are also building evidence to address human resources issues that impact health service delivery. Evidence is critical for planning educational needs. We must be able to predict how many nurse educators and the competencies nurses will need to address the variety of patient problems the type of nursing services that will be needed with health care reform and care delivery models that will result in high-quality, efficient, cost-effective care. Currently, there is significant evidence as to the work environment characteristics that enable nurses to deliver high-quality patient care in hospitals, but evidence is sorely lacking in settings such as home health, long-term care, and public health.

To produce evidence that will be accepted by policy makers and be sustainable, nurse researchers are using a variety of research methods, including nontraditional methods such as s action research and comparative effectiveness. Stringer (2007) defines action research as “a collaborative approach to inquiry or investigation that provides people with the means to take systematic action to resolve specific problems” (p. 8). Action research can be community-based and starts with an interest or problem identified by a group, community, or organizations. Findings may indicate a need for policy changes, which are more apt to be accepted and sustained if the there is collaboration among stakeholders from the inception of the problem. Comparative-effectiveness research can provide evidence on the effectiveness and benefits of health services. Evidence can be found through systematic reviews or specific studies (Agency for Healthcare Policy and Research, 1998).

The nurse researchers’ ability to effect change may be challenging. Inhibiting change factors include the policy maker’s lack of skills and knowledge, poor timing, lack of perceived relevance, use of jargon, and only presenting and publishing findings to a scholarly audience. Knowledge translation models provide a framework that can facilitate the use of research findings by policy makers. Knowledge exchange is the exchange, synthesis, and application of knowledge by relevant stakeholders for the purpose of health system improvement. Knowledge transfer models range from linear to complex organic depictions of interactions from identification of the problem through dissemination (Sudsawad, 2007).

A framework that can be used to plan dissemination activities is Kingdon's (2003) model of three families of agenda setting processes: problems, policies, and politics streams. When the three streams converge, the greatest agenda change occurs. Kingdon's framework can help researchers strategize when to disseminate their findings. Windows open quickly in policy streams and provide opportunities for action. One of the strategic goals of the American Academy of Nursing is to "influence policy through dissemination of nursing's contribution to improved health outcomes and care delivery" (Gilliss, 2010). The American Academy of Nursing acknowledges that nursing needs to be policy ready and that nursing can influence policies that impact our health.

Susan Tullai-McGuinness

HEALTH SERVICES RESEARCH

Health services research is defined as a multidisciplinary field of inquiry that studies how a broad range of social, financial, technological, and organizational factors and personal behaviors impact the accessibility, cost, efficiency, and quality of health care at the individual, population, organization, and institution levels (Lohr & Steinwachs, 2002). The overall goals of health services research are to reduce disparities and to improve safety, quality, and cost-effectiveness by influencing policy decisions that address the financing, organization, management, and delivery of health care services. Findings from health service research are used to guide organizational, institutional, and public policy decisions. For example, the Centers for Medicare and Medicaid Services uses health services research to inform payment and benefit issues. Professional associations, advocacy and interest groups, organizations, and others looking to change or create policy use findings from health services research to support their position.

The roots of health services research traces to the 1920s. Philanthropic foundations funded research to improve lives of those living in poor socioeconomic conditions (Mullner, 2009). It was not until the mid-1960s that health services research emerged as a discipline (Institute of Medicine [IOM], 1979). In 1967, President Lyndon B. Johnson created the National Center for Health Services Research charged with coordinating research efforts to reach national health care objectives. Currently, health services research is positioned within the Department of Health and Human Services as the Agency for Healthcare Policy and Research (AHRQ), although many branches of the government also house health services research. Some include the Centers for Disease Control, the Centers for Medicare and Medicaid Services, and the Veterans' Administration. The Congress often sets direction for allocation of health services research dollars. As part of the 2003 Medicare Modernization Act, the Congress mandated AHRQ to conduct and support the comparative-effectiveness research on specific issues.

The IOM (1979) identified four levels of health services research: clinical, institutional, systematic, and environmental. Clinically oriented studies examine characteristics of providers, patients, and resources that impact the processes and outcomes of care. The focus is on the broader range of outcomes, such as patient satisfaction, cost, and effectiveness of care. Institutional studies focus on administration and the organization, such as differences in quality of care in home health agencies of different sizes and service areas or the differences in cost of care provided in the home versus nursing home. Systematic studies examine the characteristics of the health care system as they relate to the interrelationships between the demand for health care services, providers, and health care institutions. System characteristics of interest may be the type of financing, regulatory programs, or practice sites. The aims of environmental studies are to understand the larger political, social, and economic contexts that shape the health services system and define its societal functions. These include studies of the legal and ethical responsibilities of health care organizations and the population's expectations of the health services (IOM, 1979)

Health services research does not call for a specific mix of disciplines, rather researchers from multiple disciplines bring complimentary skills to address the questions being studied (Ricketts, 2009). There is an overlap of health services research with a number of other fields, such as environmental health, behavioral sciences, biomedical research, and epidemiological research (IOM, 1979). The uniqueness of health services research can be exemplified by looking at smoking research. Biomedical research informed us of the effect of smoking on health, whereas health services research provided data on the financial impact of health problems related to smoking. Data were then used to support the argument for smoke-free legislation.

AcademyHealth, the professional home for health services researchers, has recently held several conferences to identify competencies in health services research education. Consensus on core training requirements has not been reached (Ricketts, 2009). Preparation to conduct health services research varies. There are more than 124 health services research graduate programs in the United States and Canada, pre- and postdoctoral training programs, and clinician-specific training programs with funding available from a variety of sources including AHRQ, the Robert Wood Johnson Foundation, the Veterans Administration, and the National Institute of Nursing Research (Ricketts, 2009).

Health services researchers use a number of frameworks to guide their studies (Mullner, 2009). Avedis Donabedian's structure–process–outcome framework examines how structures of health care organizations impact the processes of care and patient and nurse outcomes (such as satisfaction and retention). Anderson's Behavioral Model measures how predisposing, enabling, and need factors at the individual and organizational level contribute to access, patient satisfaction, and quality of care. Hochbaum's Health Belief Model focuses on factors that lead to individual motivation health-related behavioral changes. The Theory of Reasoned Action has been used to guide studies that focus on behavioral attitudes and their effect on intention to act.

Health disciplines conduct the majority of health services research. Nursing has more recently been recognized as a significant contributor to health services research. Russell and Fawcett's (2005) conceptual model provides a framework that can be used in discussing nursing and health policy. Each of the models' four interacting levels addresses concepts of human beings, environment, health, and nursing and can be used to evaluate access, cost, and quality that are outcomes of concern to health services researchers. Levels focus on the individual, family, group, or community (Level 1); the nursing practice subsystem or health care delivery system (Level 2); the health care system (Level 3); and the world health administrative practice (Level 4).

A review of nursing and health services research on health care organizations (Level 2—the nursing practice subsystem) between 1950 and 2004 shows that the majority of nursing's research contributes to health services research in the area of the organization and how organizational factors impact care delivery, nurse staffing, and patient safety and quality outcomes (Mick & Mark, 2005). Moreover, these researchers may not use health services research language and may not publish in health services research journals. Some of the gaps identified in the review include the lack of frameworks connecting organizations factors to work processes and the need for more sophisticated analytical methodologies (Mick & Mark, 2005).

In 1999, nurse health services researchers began meeting informally at AcademyHealth conferences. They formed the Working Group on Health Services Research and Nursing in 2001, and in 2003, the group became an interest group of AcademyHealth. Their goals are to further the knowledge of health services research in practice and education through interdisciplinary community with interest in health services research issues important to nursing and with the skills needed to conduct rigorous health services research (Havens & Brewer 2003). Areas where nurse health services researchers can contribute include access and utilization of health care, health behaviors, patient safety and quality of care, cost and cost-effectiveness of care, and organization and care delivery (Jones & Mark, 2005).

Health services research does have unique challenges. Although numerous data sets are available through state and federal agencies, they can present multiple problems. Often there is a lack of published evidence related to reliability and validity of instruments used to collect data. Linking various data bases is often challenging, and nurse researchers may have difficulty finding statisticians skilled in multimethod analysis. To build capacity, nurse leaders in health services research have identified the need for interdisciplinary training, postdoctoral opportunities for training in health services research, integration of theories from multiple disciplines in training programs, and exposing nurses to a variety of methods and analytical approaches used in health services research.

The Patient Protection and Affordable Act, signed into law in 2010, may play a significant role in the focus of health services research. Under this Act, the Patient-Centered Research Institute, a nonprofit corporation, was formed. In part, the institute's role will be to identify research priorities. They must take into account the disease incidence, prevalence, and burden with a focus on chronic diseases; the gaps in evidence of clinical outcomes; the potential new evidence to improve health and quality of care; and the effect of conditions, treatment, and patient needs, preferences, and outcomes on national expenditures. The Act provides a mandatory funding stream for comparative clinical effectiveness research and also ensures that demographic data on health disparities be collected and made available to researchers to help understand health disparities. It is yet unclear how the Patient Protection and Affordable Act will impact health services research. Yet, nursing is becoming well positioned in playing a key role in health services research (A Report from the Coalition for Health Services Research, 2010).

Susan Tullai-McGuinness

HEMODYNAMIC MONITORING

Hemodynamic monitoring is the use of critical care technology to enhance the clinical assessment of the patient's cardiac and pulmonary status and guide appropriate therapeutic interventions. Hemodynamic monitoring devices such as the pulmonary artery catheter (PAC), first introduced by Dr. Jeremy Swan (Swan et al., 1970), are commonly used in the intensive care unit. The standard catheter is 7.5F and 110 cm long with multiple lumens to monitor various pressures within the heart. It is used to assess ventricular function, differentiate shock states, and cardiac and pulmonary disorders and to facilitate early identification of sepsis and organ dysfunction.

The tip of the catheter is positioned in the distal pulmonary artery (PA) and attached to a pressure transducer system that converts physiologic/mechanical signals to electrical signals and provides a continuous display of pulmonary systolic, diastolic, and mean pressures. The distal balloon port is used to measure the PA wedge (occlusive) pressure, an indirect measure of left ventricular end diastolic pressure. The proximal lumen is used to monitor right atrial pressures and used as an injectate port for cardiac output. The catheter's thermistor port provides a continuous display of the blood (core) temperature. Additional enhancements include specialized catheters for continuous monitoring of cardiac output, fiber optic monitoring of mixed venous oxygen saturation (SvO_2), right ventricular end diastolic volume and ejection fraction, and intracardiac atrioventricular sequential pacing.

Hemodynamic indices are obtained by the critical care nurse and used in conjunction with derived parameters such as systemic vascular resistance and pulmonary vascular resistance. Nurses make assessments and in collaboration with physician colleagues institute goal-directed therapy to optimize the heart rate, preload, afterload, and contractility to improve overall cardiac output and tissue perfusion. Nurses must be trained with the requisite knowledge and skills to work with these invasive devices and hemodynamic monitoring remains a fundamental component of critical care nursing curriculum.

Historically, the gold standard for hemodynamic monitoring has been the use of the PAC for the assessment and management of critically ill patients. Questions continue to be raised in medical journals and within the critical care community about the relative risks versus benefits of the using the invasive catheter. As a result, there is a distinct trend toward minimally invasive and noninvasive methodology in the last decade. Esophageal Doppler monitors measure aortic blood flow and assess stroke volume (SV) and heart rate–adjusted cardiac output via a probe placed within a nasogastric tube. Exhaled CO_2 technology measures blood flow from exhaled CO_2, and cardiac output is derived using a modified Fick equation. Clinical application requires use of controlled ventilation and has primarily been limited to the operating room setting.

A new less invasive device uses arterial pressure–based SV to derive cardiac output measurements. It is based on the Stewart–Hamilton equation but uses a dilution curve from an arterial tracing via a sensor attached to an existing arterial line. The device measures SV variation to guide fluid administration and is considered a more sensitive indicator compared with traditional static measures of preload using the PA catheter (Headly, 2005, 2006). SV is derived from the arterial line waveform using an equation (SV = K × pulsatility). The constant takes into account the vascular resistance, arterial compliance (based on sex, height, weight, and age and pulse pressure waveform characteristics), and pulsatility (based on an analysis of the contour of the arterial pressure waveform; Manecke, 2005). This technology has limitations, and many factors affect the accuracy. The majority of research was done under controlled situations with the patients on controlled ventilation and specific tidal volume settings (Bridges, 2008). The accuracy of this technology requires that the patient is intubated with fixed tidal volume and respiratory rate. Irregular rhythm with variability in heart may affect accuracy. There is great opportunity for future nursing research to examine the risks versus benefits of the new less invasive options and to examine the impact of nurse-driven goal-directed therapy to optimize patient outcomes. Clinical outcomes such as decreased number of ventilator days and reduced blood stream infection using noninvasive methods are important outcome measures. Decreased number of intensive care unit days and a reduction of overall hospital length of stay have significant economic impact upon hospital organizational throughput efforts and financial goals.

Nursing research has kept pace with new enhancements to the original balloon-tipped, flow-directed catheter. Initial research studies focused on the technical and clinical variables that affect accuracy of PA pressure monitoring such as the seminal study by Woods and Mansfield (1976) that examined the effect of body position upon PA and pulmonary capillary wedge pressure in noncritically ill patients. These and subsequent studies laid the groundwork for evidence-based practice protocols for referencing (leveling the air/fluid interface) and the zeroing the system at the phlebostatic axis, performing the square wave test to assess the system dynamic response, and stipulating the frequency that leveling and zeroing must be performed to insure accuracy of hemodynamic measurements. Research studies also examined accuracy of hemodynamic pressures in various backrest positions and side-lying positions. The accuracy and reliability of hemodynamic pressures has been shown to be valid in patients with backrest elevations (head of bed) between 0° and 60° if patients remain supine in bed and the air/fluid interface is maintained at level of the phlebostatic axis. Similarly, it has been shown that accuracy is maintained for patients in various lateral recumbent/side-lying positions using an angle-specific reference point at 20°, 30°, or 90°, as long as the air/fluid interface is maintained at the designated phlebostatic axis. The impact of these studies is immense, given that turning and positioning are essential in the prevention of complications such as hospital-acquired pressure ulcers and contractures, atelectasis, and nosocomial pneumonia. Research has also shown that hemodynamic measurements must be obtained using a strip recorder rather than reading directly from the digital monitor. Furthermore, the reading must be correlated with the ECG and timed with end diastole using the ECG simultaneously. The respiratory cycle must also be considered and all pressures must read at end-expiration to negate the effects of changes in intrathoracic pressure. Rizvi et al. (2005) have shown the effectiveness of airway pressure display in the assessment of vascular pressures in patients with acute respiratory distress syndrome. The study helps resolve the technical difficulty of measuring hemodynamic indices in ventilated patients with severe respiratory variation and high levels of positive end expiratory pressure.

A recent study by Walsh et al. (2010) examined iced temperature versus room temperature for cardiac index measurement in hypothermic and normothermic patients. The study found that patients with normal cardiac index during hypothermia did not have a significant difference in cardiac index regardless of type of injectate (iced vs. room temperature). However, significant differences were found between iced and room temperature injectate in patients with low cardiac index (<2.5 L/min) during hypothermia. The use of iced injectate is the current standard of practice for patients with low cardiac output. Because of the significant difference in cardiac index in low output hypothermic patient, use of iced injectate under conditions of hypothermia was recommended.

Of note is a study that examined complications related to PAC removal by critical care nurses as compared with medical doctors (Oztekin, Akyolcu, Oztekin, Kanan, & Goskel, 2008). The results of the study validates previous studies and the importance of training and competency of critical care nurses in the procedural aspects related to safe removal of PAC by the registered nurse.

The American Association of Critical Care Nurses (AACN, 2004) has recently published a document entitled, *AACN Practice Alert on Pulmonary Artery/Central Venous Pressure Measurement*, that would be helpful to those interested in the conduct of research related to hemodynamic monitoring. It outlines expected practice for nursing practice and provides an excellent, comprehensive, and extensive literature review of the research related to PA and central venous pressure and is ranked according to the strength of evidence.

There is a growing body of evidence and support for less invasive methods of hemodynamic monitoring as a result of continued controversy regarding the safety and efficacy of the traditional PA. Minimally invasive/noninvasive forms of hemodynamic monitoring are on the forefront providing new insights into the dynamic rather than static measurements of the heart. Critical care nurses must be well trained, knowledgeable in theoretical concepts, and competent in technical aspects of the catheter to ensure patient safety and appropriate use of the technology. Nurses must therefore continue their conduct of research in hemodynamic monitoring to reexamine existing practices and traditions, and replication studies on the knowledge and clinical competency of nurses caring for patients with PA catheters are encouraged. Studies examining new technology in hemodynamic monitoring will add to the growing body of knowledge and continue to advance the art and science of nursing.

Maureen Keckeisen

HENDERSON'S MODEL

Since 1960, when the International Council of Nurses first published the *Basic Principles of Nursing Care*, a work their Nursing Service Committee commissioned, Virginia Henderson's description of nursing and the unique function of the nurse has been used throughout the world to standardize nursing practice. The *Basic Principles of Nursing Care* was written just after the 1955 publication of Harmer and Henderson's *Textbook of the Principles and Practice of Nursing*, fifth edition (Henderson, 1955), which until 1975 was the most widely used nursing textbook in English- and Spanish-speaking worlds. A third book, *The Nature of Nursing* (Henderson, 1966, 1991), included implications for how nursing could provide direction for four essential functions of a profession: service, education, research, and leadership. Henderson's model of nursing is most succinctly presented in the International Council of Nurses's *Basic Principles of Nursing Care*, a work available in 30 of the world's languages. Basic nursing care means helping patients with activities such as eating and drinking adequately, eliminating body wastes, and moving and maintaining desirable postures or providing conditions under which he can perform them unaided. Henderson also described conditions in persons that always affect basic needs such as nursing care of a newborn or the dying. According to Henderson's model, the nurse is temporarily the consciousness of the unconscious, the love of life for the suicidal, the leg of the amputee, the eyes of the newly blind, a means of locomotion for the infant, the knowledge and confidence for the young mother, and a "voice" for those too weak to speak (Henderson, 1997, pp. 23–24).

Nite and Willis (1964) explicitly tested the Henderson model of nursing in clinical experiments of effective nursing care for cardiac patients. Brooten and Naylor (1995) and Naylor et al. (1999) implicitly examined this model in clinical research. The "nurse dose" that they seek to measure may indeed be some quantified measure of this unique function.

Three of Henderson's papers extend her model: two by validation and the other by contradiction. *The Concept of Nursing* (Henderson, 1978) specifically addressed her work as a model. *Preserving the Essence of Nursing in a Technological Age* (Halloran, 1995, p. 96) extended her ideas to include services nurses provide in intensive care units and was organized using the four essential professional functions first depicted in *The Nature of Nursing*: practice, education, research, and leadership. In *Nursing Process—Is the Title*

Right?, Henderson (Halloran, 1995, p. 199) contradicted what had become the accepted alternative to the use of the word "nursing" by arguing that the word "process" unnecessarily constrained professional vision and precluded experience, logic, expert opinion, and research as bases for practice.

Edward J. Halloran

HERMENEUTICS

Historically, hermeneutics described the art or theory of interpretation (predominantly that of texts) and was prevalent in disciplines such as theology and law. German philosopher Wilhelm Dilthey (1833–1911) redefined hermeneutics as a science of historical understanding and sought a method for deriving objectively valid interpretations. Martin Heidegger (1889–1976) recast hermeneutics from being based on the interpretation of historical consciousness to revealing the temporality of understandings (Palmer, 1969).

Hermeneutics is an approach to scholarship that acknowledges the temporal situatedness of researchers, participants, and phenomena of study. Time as it advenes, or time as lived, is central to the work of hermeneutics. The centrality of time is what differentiates hermeneutic phenomenology from traditional forms of Husserlian phenomenology. The hermeneutic scholar works to uncover how humans are always already given *as* time. Hermeneutics has no beginning or end that can be concretely defined but is an experience of persistently questioning phenomena (matters of concern manifested temporally and historically; Diekelmann & Diekelmann, 2009; Gadamer, 1960/1989).

Interpretation presupposes a threefold structure of understanding, which Heidegger (1927/1962) called the fore-structure. The premise of the fore-structure is that all interpretation is based on background practices that grant a practical familiarity with phenomena. Heidegger called this sense of phenomena (familiarity) fore-having. Background practices also form the perspective (foresight) from which we understand phenomena. Fore-conception describes our anticipated sense of what our interpreting will reveal. This too is shaped and framed by our background practices. Understanding is circular, and humans as self-interpreting beings are always already within this interpretive (hermeneutic) circle of understanding. Thus, "interpretation is never a presuppositionless grasping of something previously given" (Heidegger, 1927/1962, p. 141) but is an explication of temporal understandings of the engaged, dynamic relating of beings and world.

Hermeneutic researchers do not attempt to isolate or "bracket" their presuppositions but rather to make them explicit. Hans-Georg Gadamer (1960/1989), a student of Heidegger's, has extended hermeneutical research in this area. The essence of hermeneutics lies not in some kind of mystic relativism but in an attitude of respect for the impossibility of bringing understanding of the engaged openness of being to some kind of final or ultimate closure. Rather, the way of hermeneutics is to be underway, to be drawn into the "mediating immediacy (openness, between) of concerned involvements" (Diekelmann & Diekelmann, 2009, p. 155).

The work of the hermeneutic phenomenologist moves beyond the traditional logical structures and presuppositions of realisms and idealisms to reveal and explicate otherwise hidden (taken-for-granted) understandings. Calling attention to human practices, concerns, and experiences, hermeneutics is closely related to critical social theory, feminisms, and postmodernism. Unlike these, however, hermeneutics does not posit politically or psychologically determined frameworks as the modus operandi of method, nor does the hermeneutic phenomenologist attempt to posit, explain, or reconcile an underlying cause or essence of a particular experience. Rather, the rich descriptions of common practices and shared meanings are intended to reveal, enhance, or extend understandings of human situations as they are experienced (Smythe, Ironside, Sims, Swenson, & Spence, 2008).

The thinking that accompanies hermeneutical scholarship is reflective, reflexive, and circular in nature (Smythe et al., 2008). However, describing the process of hermeneutical research may suggest a linearity and stepwise structure that belies the seamless, fluid nature of this approach to inquiry. On the other hand, not describing the process implies a thoughtless or haphazard approach that does not reflect the scholarliness of hermeneutical research. Therefore, although a brief summary of one approach to hermeneutical analysis is given here, the reader is referred to several authors who discuss hermeneutical methodologies in more detail (Diekelmann & Diekelmann, 2009; Gadamer, 1960/1989; Heidegger, 1988/1999; Palmer, 1969).

Hermeneutical researchers often work in teams to study areas of shared interest and expertise. Teams often include content and methods experts, practitioners, students, and participants. Team members hone the interpretation of study data by participating in dialogue and debate wherein emerging insights can be shared and extended and "blind spots" illuminated.

Although sources of data vary (e.g., existing texts, written or retold accounts, individual interviews, focus groups, art, photographs), verbatim transcriptions of nonstructured interviews are the most common in the nursing literature. Data gathering and analysis often occur throughout the course of the study.

Analysis of the text begins when team members read each interview to obtain an overall understanding of the experiences being shared by each participant. From this reading, team members identify themes within each interview and explicate the meaning and significance of this theme to the overall understanding of the phenomenon. Team members share their written interpretations, including excerpts from the data. Dialogue among team members clarifies, expands, and refines the identified themes and accompanying interpretation. As the team analyzes subsequent interviews, they read each new text against those that preceded it. This enables new themes to emerge and previous themes to be continuously refined and expanded or challenged and overcome. Team members clarify any discrepancies in the interpretations by referring to the interview text or reinterviewing participants. Through dialogue, the team members strive to explicate and refine the often subtle and nuanced understandings across the data that reveal new possibilities for thinking and practice.

As the analysis continues, team members identify and explore themes that cut across interview texts. They reread and study interpretations generated previously to see if similar or contradictory interpretations are present in the various interviews. Although a presupposition of hermeneutical analysis is that no single correct interpretation exists, the team's continuous examination of the whole and the parts of the texts with constant reference to the participants ensures that interpretations are warranted (focused and reflected in the text).

Reading widely across postpositivist, feminist, critical, postmodern, and philosophical texts, team members situate their analysis and hold the identification and interpretation of common practices (themes) open and problematic. In other words, bringing this literature to bear on the analysis, team members critique their interpretations to extend, support, or overcome identified themes.

During the interpretive sessions, patterns may emerge. A pattern is constitutive and present in all the interviews, expressing the relationship of the themes. Patterns are the highest level of hermeneutical analysis. The hermeneutic approach provides an opportunity for team members and researchers not on the team to review the entire analysis for plausibility, coherence, and comprehensiveness. In addition, participants in the study may be asked to read team members' interpretations to confirm, to extend, or to challenge the analysis. Others, not included in the analysis but likely to be readers of this study, may also review the written interpretations. This review process often extends the analysis and exposes any unsubstantiated and unwarranted interpretations that are not supported by the texts. The purpose of the research report is to provide a wide range of explicated text so that the reader can recognize common practices and shared experience and participate in the analysis.

Diekelmann and Diekelmann (2009) suggest presenting the insights gleaned from hermeneutic analysis in converging conversations as a way of keeping themes and patterns "in motion" (p. xvii). A converging conversation brings excerpts from multiple interviews into conversation with each other, the literature, and the themes, patterns and questions illuminated by the analysis. This approach draws the reader into the conversation with the phenomenon of study (rather than presenting "findings" as an implied end point or last word) and retains the historical/temporal situatedness of understanding.

Hermeneutic phenomenology was introduced to nursing more than 25 years ago by Patricia Benner in her studies of expertise in nursing practice (Benner, 1984; Benner, Tanner, & Chesla, 1996). Since that time, hermeneutics has emerged as a significant area of scholarship in nursing and is being used in diverse areas such as nursing education (Diekelmann & Diekelmann, 2009; Ironside, 2006), chronic illness (Ellett, Appleton, & Sloan, 2009; Sloan & Pressler, 2009), cancer care (Alqaissi & Dickerson, 2010), and sexual violence (Ratchneewan et al., 2010).

Pamela M. Ironside

HISTORY OF NURSING RESEARCH

The first public health policy act was signed on July 16, 1798, by President John Adams. A public health service organization, later named the U.S. Public Health Service (USPHS), would operate hospitals and rest homes for sick merchant seamen. The act was expanded in 1877 as a result of a yellow fever epidemic in New Orleans that required the passage of the Quarantine Act of 1878.

In 1879, a national Board of Health was established to monitor public health regularly, especially in the area of sanitation. A weekly report that later became the *Public Health Reports* was published. The board had the authority to intervene in case of an epidemic. In the late nineteenth century, Robert Koch and Louis Pasteur made important discoveries about the nature of infectious diseases that explained the transmission of such diseases and aided in controlling their spread. In this control, government had a significant role.

Although the role of the federal government became significant in 1938 through grants-in-aid to universities under a research grants program, it is generally held that nursing research began after World War II, although the work of Florence Nightingale (1820–1910) introduced the use of statistics in analyzing nursing data. Beginning in 1920, the Goldmark study was the first of the landmark studies of nursing. Research developed into nursing education, time studies, salaries, supply and demand, employment conditions, costs, status of nurses, job satisfaction, needs, and resources. In 1955, the Nursing Research Grants and Fellowship Program of the Division of Nursing (USPHS) was established; it awarded grants for nursing research projects, nursing research fellowships, and nurse-scientist graduate training. In 1978, the Division of Manpower Analysis was established within the Division of Nursing in the Bureau of Health Manpower to conduct research on manpower.

In the nineteenth century, Florence Nightingale, a founder of modern nursing, was the first nurse to do research in connection with nursing, when she used statistics in the analysis of her data. She was the first biostatistician in nursing. Nightingale did her work alone and not until after World War II was there an organized, continuing effort to conduct further nursing research. Nursing care research is defined as research directed to understanding the nursing care of individuals and groups and the biological, physiological, social, behavioral, and environmental mechanisms influencing health and disease that are relevant to nursing care. Nursing research develops knowledge about health and the promotion of health over the life span, care of persons with health problems and disabilities, and nursing actions that enhance the ability of individuals to respond effectively to actual or potential health problems. The following is a summary of major hallmarks in the history of nursing research:

1920 Josephine Goldmark, under the direction of Haven Emerson, conducted a comprehensive survey that identified the inadequacies of housing and instructional facilities for nursing students.

1922 In a time study of institutional nursing, the New York Academy of Medicine showed wide discrepancies in the costs of nursing education and services.

1923 The Committee for the Study of Nursing Education conducted the first comprehensive study of nursing schools and public health agencies. The final report was published as *Nursing and Nursing Education the United States.*

1924 The first nursing doctoral program was established at Teacher's College, Columbia University.

1926 May Ayres Burgess was commissioned by the Committee on the Grading of Nursing Schools to ensure that nursing service provided adequate patient care. The result was the classic report, *Nurses, Patients, and Pocket-books.*

1934 The second project of the Committee on the Grading of Nursing Schools was a job analysis reported in *An Activity Analysis of Nursing*. The grading of nursing schools was not realized until the establishment of the National Nursing Accrediting Service in 1950.

1935 The American Nurses Association (ANA) published *Some Facts About Nursing: A Handbook for Speakers and Others*, which contained yearly compilations of statistical data about registered nurses.

1936 The ANA scrutinized the economic situation of nurses by studying incomes, salaries, and employment conditions; it excluded public health nurses.

1939 The second project of the Committee on the Grading of Nursing Schools was a job analysis reported in *An Activity Analysis of Nursing.* The grading of nursing schools was not realized until the establishment of the National Nursing Accrediting Service in 1950.

1940 Pfefferkorn and Rovetta compiled basic data on the costs of nursing service and nursing education.

1940 The American Nurses Association (ANA) published *Some Facts About Nursing: A Handbook for Speakers and Others*, which contained yearly compilations of statistical data about registered nurses.

1941 The USPHS conducted a national census on nursing resources in cooperation with state nursing associations as World War II loomed.

1943 The National Organization of Public Health Nursing surveyed needs and resources for home care in 16 communities. The work was reported in *Public Health Nursing Care of the Sick.*

1948 The publication of the Brown Report identified issues facing nursing education and nursing services for the first half of the century. The recommendations led to much research during the next 10 years, for example, studies on nursing functions, nursing teams, practical nurses, role and attitude studies, nurse technicians, and nurse–patient relationships. Other studies rooted in the Brown report were on the hospital environment and economic security as well as the report *Nursing Schools at Mid-Century*, from the National Committee for the Improvement of Nursing Services. The Division of Nursing Resources (now the Division of Nursing) of the USPHS conducted statewide surveys and developed manuals and tools for nursing research. Major breakthroughs in nursing research were made by such studies as (a) patient satisfaction, (b) patient classification studies, and (c) problem-oriented record. These studies laid the groundwork for nursing research for the next 2 decades.

1949 The ANA conducted its first national inventory of Professional Registered Nurses in the United States and Puerto Rico. An Interim Classification of Schools of Nursing Offering Basic Programs was prepared with classifications I, II, and III according to specific criteria.

1950 The National Nursing Accrediting Service established a system for accrediting schools of nursing.

1952 The journal *Nursing Research* was published in June 1952. It was the ANA's first official journal for reporting nursing and health research.

1953 Leo Simmons and Virginia Henderson published a survey and assessment of nursing research, which classified and evaluated research in nursing during the precious decade. Teachers College, Columbia University, established the Institute of Research and Service in Nursing Education under Helen Bunge.

1954 The ANA established a Committee on Research and Studies to plan, to promote, and to guide research and studies relating to the functions of the ANA (1968 published) ANA Guidelines in Ethical Values.

1955 The ANA established the American Nurses' Foundation, a center for research to receive and administer funds and grants for nursing research. The foundation conducts its own programs of research and provides consultation to nursing students, research facilities, and others engaged in nursing research. *Twenty Thousand Nurses Tell Their Story* was published. The Nursing Research Grants and Fellowship Programs of the Division of Nursing, USPHS, were established to stimulate and provide financial support for research investigators and nursing research education.

1956 The study of *Patient Care and Patient Satisfaction in 60 Hospitals* was published.

1957 The Department of Nursing, established at Walter Reed Army Institute of Research, provided opportunities for growth in military nursing research. The Western Interstate Commission for Higher Education sponsored the Western Interstate Council on Higher Education for Nursing to improve the quality of higher education for nursing in the western United States, focus on preparing nurses for research, and develop new scientific knowledge and communicate research findings. Other such groups were the Southern Regional Education Board, the New England Board of Higher Education, the Midwest Alliance in Nursing, and the Mid-Atlantic Regional Nurses Association.

1959 The National League for Nursing (NLN) Research and Studies (later the Division of Research) was established to conduct research, to provide consultations to NLN staff, and to maintain information about NLN research products.

1960 Faye Abdellah developed the first *federally* tested Coronary Care Unit and published *Patient Centered Approaches to Nursing*, which altered nursing theory and practice.

1963 The Surgeon General's Consultant Group on Nursing reported on the nursing situation in the United States and recommended increased federal support for nursing research and education of researchers. The *Nursing Studies Index*, Volume IV, 1957–1959, was completed as a guide to analytical and historical literature on nursing in English from 1900 to 1959. Volume I, 1900–1929, was published in 1972; Volume II, 1930–1949, was published in 1970; and Volume III, 1950–1956, was published in 1966.

1964 *Nursing Research: A Survey and Assessment* provided a review and assessment of research in areas of occupational health, career dynamics, and nursing care.

1965 ANA Nursing Research Conferences (1965 through the 1980s) provided a forum for critiquing nursing research and opportunities for nurse researchers to examine critical issues.

1966 The *International Nursing Index* was published. One of the first textbooks on nursing research was published by Abdellah and Levine: *Better Patient Care Through Nursing Research.*

1968 The ANA *Blueprint for Research in Nursing* and *The Nurse in Research*, ANA guidelines in ethical values, were published.

1970 ANA Commission on Nursing Research was established and prepared position papers on human rights in research. Papers included *Human Rights Guidelines for Nurses in Clinical and Other Research* (1974), *Research in Nursing: Toward a Science of Health Care* (1976), *Preparation of Nurses for Participation in Research* (1976), and *Priorities for Nursing Research* (1976). An abstract for action made recommendations for changes in nursing such as increased practice research, improved education, role clarification and practice, and increased financial support for nursing. Overview of Nursing was supported by the Department of Health, Education, and Welfare, 1955–1968, to assess nursing research, knowledge, gaps, and future needs.

1971 The ANA Council of Nurse Researchers was established by the ANA Commission on Nursing Research to advance research activities and published issues in research: *Social, Professional, and Methodology* (1973). The Secretary's Commission, Department of Health, Education and Welfare published *Extending the Scope of Nursing Practice* as a position of the health professions to support the expansion of the functions and responsibilities of nurse practitioners.

1973 The American Academy of Nursing was founded with 36 charter fellows to advance new concepts in nursing and health care, to explore issues in health care, the profession, and the society as directed by nursing, to examine dynamics of nursing, and to propose resolutions for issues and problems in nursing and health.

1977 *Nursing Research* became the first nursing journal to be included in Med-line, the computerized information retrieval service.

1979 *Healthy People*, the Surgeon General's report on health promotion and disease prevention, was published. *Clinical Content of Nursing Proceedings Forum on Doctoral Education in Nursing* defined the content of nursing research at the doctoral level.

1980 *Promoting Health, Preventing Disease: Objectives for the Nation* was published. ANA published a social policy statement, which defined the nature and scope of nursing practice and characteristics of specialization in nursing.

1981 *Strategies for Promoting Health for Specific Populations* was published by the Department of Health and Human Services (formerly Department of Health, Education, and Welfare). Diagnosis Related Groups were mandated by Health Care Financing Administration for Medicare regarding reimbursement. This stimulated the importance of evidence-based practical nursing.

1983 The 1981 White House Conference on Aging: Executive Summary of Technical Committee on Health Maintenance and Health Promotion and the *Report of the Mini Conference on Long-term Care: Report of the Technical Committee on Health Services: Nursing and Nurse Education—Public Policies and Private Actions.* Report of the Institute of Medicine, National Academy of Sciences, defined nursing research and delineated its direction. *Magnet Hospitals: Attraction and Retention of Professional Nurses* was published by the American Academy of Nursing. *Report of the Task Force on Nursing Practice in Hospitals.* New legislation established reimbursement policies for hospitals based on prospective payment of Diagnosis Related Groups the determined amount paid for Medicare patients.

1983 The first volume of the *Annual Review of Nursing Research* series was published by Springer Publishing Company.

1984 The ANA formed the ANA Council on Computer Applications in Nursing to focus on computer technology pertinent to nursing practice, education, administration, and research. The ANA Cabinet on Nursing Research published *Directions for Nursing Research: Toward the Twenty First Century.*

1985 The National Center for Nursing Research (NCNR) was established in the USPHS. Programs would work to enlarge the scientific knowledge underlying nursing services, administration, and education. The center was initially located in the Division of Nursing, Bureau of Health Manpower, Health Resources, and Services Administration, but in 1986 it became part of the National Institutes of Health (NIH). In 1993, the NCNR was renamed the National Institute of Nursing Research (NINR).

1988 The Agency for Healthcare Policy and Research within the Department of Health and Human Services was established to focus on the development of clinical practice guidelines, outcome measures, and effectiveness research. (The name was changed to Agency for Healthcare Research and Quality).

Thirty years after the idea was first proposed by the NIH's National Advisory Council, the NCNR was established in 1986. Its mandate was "to advance science to strengthen nursing practice and health care that promotes health, prevents disease, and ameliorates the effects of illness and disability." The placement of NCNR at the NIH moved nursing research into a broader-based biomedical research environment and facilitated the collaboration between nursing and other research disciplines. On June 9, 1993, the NCNR was renamed and became the NINR, which placed nursing on an equal footing with other NIH institutes. In 2010, NINR celebrated its 25th anniversary.

The NINR is the key organ for funding nursing research grants and contracts and has approved priority areas for research as determined by its National Advisory Council for Nursing Research. The NINR provides a scientific base for patient care and is used by many disciplines among health care professionals—especially by the nation's 2.5 million nurses. NINR-supported research spans both health and illness and deals with individuals of all age groups. Nursing research addresses the issues that examine the core of patients' and families' personal encounters with illness, disability, treatment, and disease prevention. In addition, nursing research addresses issues with a community or public health focus. NINR's primary activity is clinical research, and most of the studies directly involve patients. The basic science is linked to patient problems.

The nursing programs of the USPHS stimulated the postwar expansion of nursing services through pilot studies, nursing research, and community health services. The Division of Nursing Resources, with a modest budget of $95,000 and a small staff, was able to undertake a number of landmark studies to find solutions to postwar nursing problems in hospitals and health agencies. During the years 1949 to 1955, a number of state surveys of nursing needs and resources were conducted in almost all states.

In 1954, among the many studies and tools developed by the USPHS Division of Nursing Resources (now the Division of Nursing) was a cooperative study carried out with the Commission on Nursing of Cleveland, Ohio, to discover the reasons for the understaffing of nursing departments. A by-product of the study was that it produced the outcome measure satisfaction study. Another study involved the use of disease classification for nursing planning. The diagnoses were then coded and classified into 58 groups representing discrete nursing problems. A similar methodological approach was followed in the development of the problem-oriented medical record more than a decade later and in the development of Diagnostic Related Groups. In 1955, the Congress earmarked $625,000 for nursing research and fellowships that were awarded directly to universities, hospitals, health agencies, and professional associations.

The Army Nurse Corps initiated nursing research in the military and has been a major contributor to the evolution of both military and civilian nursing research. The Army developed a program designed to concentrate on clinical nursing research in addition to fostering participation in the collaborative studies of other disciplines.

The history of nursing research in the Navy (primarily unpublished master's theses) covers research topics that are broad and focus on various aspects of the organization and administration of nursing service. Further work to incorporate nursing research into the Navy Nurse Corps became prominent in 1987, when the navy conducted a review of billets and identified the need for doctorally prepared nurses.

The history of nursing research in the air force is found primarily through the review of unpublished mimeographed documents covering research at the School of Aerospace Medicine at Brooks Air Force Base, Texas. Among the research topics reported are the development of equipment for aeromedical evacuation (such as examination lamps, oxygen and humidity apparatus, hand disinfection devices, patient monitoring and blood pressure measurement, litter lift, and transportable airborne stations). Physiological and psychological changes experienced by air force nurses associated with flying duty on jet and propeller aircraft and ways to evaluate patient care in flight are other areas of research.

In the fall of 1990, representatives from the army, navy, and air force met to discuss collaborative research among the services. This group formed the Federal Nursing Research Interest Group, which later became the Tri-Service Nursing Research (TSNR) Group. The TSNR Group was made responsible for finding ways to promote military nursing research both collectively and individually, within and across the services. The initial appropriation for the TSNR program under S.R. 102–154 was $1 million for fiscal year 1992, and it increased to $5 million in fiscal year 1996, $6 million thereafter, authorizing the TSNR program as part of the Department of Defense Health Care Program, administered by the TSNR Group and established at the Uniformed Services University of the Health Sciences. In 2000, the Council for the Advancement of Nursing Science created the research policy and facilitation arm of the American Academy of Nursing.

Faye G. Abdellah

HIV/AIDS CARE AND TREATMENT

Throughout the world, HIV/AIDS is emerging as a chronic illness that has a particular impact on marginalized and/or economically constrained populations. In developed countries, HIV/AIDS is disproportionally impacting communities of color, specifically African Americans, and persons who engage in behaviors such as injection drug use and/or sexual behaviors that result in a high risk for infection. Many people living with HIV/AIDS in the developed world are triply diagnosed with substance abuse and mental illness, which impacts on treatment adherence (Chander et al., 2009), engagement with the health care system, and participation in research. Because of the complex cultural and political factors along with poverty, the incidence of HIV/AIDS in some developing countries has impacted on projected life expectancies for persons born in those countries. Many nursing researchers have established international partnerships to address specific issues of living with HIV/AIDS in resource constrained countries particularly those located in sub-Saharan Africa. Articles are coauthored by nursing investigators living in diverse settings, which greatly contribute to the research and dissemination capacity of nurses in both settings. Through programs such as the United Nations Global Fund (http://www.theglobalfund.org/en/) and the PEPFAR (http://www.pepfar.gov/), more HIV-infected persons throughout the world are accessing treatment for their infection. Although treatment has greatly impacted on controlling the incredible mortality rates, it also raises issues related to adherence and management of side effects because the availability of specific antiretroviral therapy medications options is limited in many parts of the world because of the ongoing cost issues.

Symptoms can emerge from the disease pathology, treatment strategies, and comorbidities. Nurse researchers have examined individual symptoms such as fatigue (Pence et al., 2009) and peripheral neuropathy (Nicholas et al., 2010). The UCSF International HIV/AIDS Nursing Research Network continues to conduct research and publish work on self-care symptom management strategies for six commonly reported symptoms (anxiety, depression, diarrhea, fatigue, nausea, and neuropathy), including an intervention study that examined the effectiveness of a paper-based symptom management manual compared with a nutrition manual in controlling multiple symptoms (Wantland et al., 2008).

Treatment guidelines for HIV and related comorbidities, such as tuberculosis, are examined using the most current evidence from clinical trials every 6 months by a panel of HIV specialists (http://aidsinfo.nih.gov/Guidelines/GuidelineDetail.aspx?MenuItem=Guidelines&Search=Off&GuidelineID=7&ClassID=1). To suppress the HIV viral load, adherence with prescribed medications is essential. Nursing research has examined different approaches to promoting adherence (Holzemer et al., 2006) and (Erlen & Sereika, 2006), but as treatment regimens evolved from 20 plus pills three times a day with food and activity restrictions to one pill one time a day with a longer half-life, adherence challenges have decreased for motivated clients.

Multiple theoretical perspectives have been used in nursing research with HIV/AIDS samples, including the common sense model of illness representation (Reynolds et al., 2009) and the Chronic Care Model (http://www.improvingchroniccare.org/index.php?p=The_Chronic_Care_Model&s=2). The Centers for Disease Control and Prevention advocates routine screening of all patients in health care settings (http://www.cdc.gov/hiv/testing/HIVStandardCare/). As these guidelines become implemented in high incidence settings such as New York State, research will be needed to determine organizational structures that promote case finding along with access to high-quality HIV care for newly diagnosed persons who did not realize that they had engaged in a risk behavior. Although vaccine development continues to be a challenge, there is strong belief that a vaccine will become available and interdisciplinary research will be needed to explore optimal delivery strategies to often invisible populations such as transgender youth (Stieglitz, 2010). Stigma continues to be associated with an HIV diagnosis even in high incidence settings with long established epidemics (Kalichman et al., 2009), and this stigma often results in nondisclosure and compartmentalizing of treatment providers. Widespread adoption of electronic health records might break down some communication barriers if consumers believe that technology will improve the quality of their care and health outcomes. Perhaps one of the most pleasant surprises is that the number of older people living with HIV/AIDS continues to grow because of effective treatment options and new infections. However, little research has examined the unique characteristics of older persons who are often living not only with HIV/AIDS but also diabetes, hypertension, liver disease, and kidney issues and who have significant social support issues because many live alone (Nokes et al., 2011).

Kathleen M. Nokes

HIV RISK BEHAVIOR

Since the recognition of AIDS and the identification of HIV as its contributing cause, the population living with HIV worldwide continues to increase and the HIV/AIDS pandemic remains a global plague that affects people in almost every country. The United Nations Program on AIDS/HIV (UNAIDS) reports that in 2009, more than 33 million people were estimated to be living with HIV/AIDS globally, including approximately 2 million children and 15 million women, and 2.7 million people were newly HIV infected (UNAIDS, 2009). This total number of HIV-infected population was more than 20% higher than the number in 2000, and the prevalence was roughly threefold higher than in 1990 (UNAIDS, 2009). This ongoing rise in the population with HIV/AIDS infection has made AIDS continue to be a major global health priority and highlighted the need to continually advocate for the reduction of HIV risk behaviors. Because an effective vaccine or cure for HIV/AIDS infection has still not been invented yet, developing effective behavioral-change interventions to prevent or reduce the key risk behaviors for HIV transmission is extremely important. Nurses, with an obligatory role in providing quality health care for all, are cooperating with other professional disciplines and contributing to the prevention of HIV/AIDS infection.

HIV risk behavior generally refers to the behaviors that lead to possible transmissions of HIV and increase the likelihood of having HIV infection. Research up to date has identified that HIV is mainly transmitted through unprotected penetrative (vaginal or anal) intercourse and oral sex with an infected person; through blood transfusion with contaminated blood; by using contaminated syringes, needles, or other sharp instruments; and from an infected mother to her child during pregnancy, childbirth, and breastfeeding (UNAIDS, 2008). Among these HIV risk behaviors, sexual contact is the major exposure to the HIV transmission in most reported AIDS-infected cases. Studies to date have identified that unprotected sexual intercourse, having multiple sexual partners, and injection drug uses are the main risk behaviors for HIV transmission. Unsafe sexual behavior, risky sexual behavior, or sexual risk-taking behaviors are the terms commonly and widely used by scientists and researchers to represent sexual activity or behavior that increases the risk of getting sexually transmitted diseases, including HIV/AIDS infection, or becoming pregnant. Because the tragedy of the HIV/

AIDS epidemic is spreading gravely, these terms in most studies specifically refer to HIV/AIDS-related sexual behavior.

Many psychosocial, biological, and sociologic circumstances or cofactors have been recognized as impacting the likelihood of HIV risks. The personal factors, including age, gender, race, developmental stage, early age of initiation of intercourse, HIV/AIDS-related sexual knowledge, mental health, sexual identity, self-esteem, self-efficacy, alcohol uses, and the use of illicit drugs, are found to be associated with increase or decrease risks of HIV infection. Interpersonal factors such as discussing safe sex with sexual partners and asking sexual partners about his or her sexual history and being ethnic minorities may also be correlated with the risk of HIV infection. Environmental factors, including social economic status, peers, schools, families, gender roles, cultural norms, religious beliefs, political and health policies, and social isolation, were also found to influence the likelihood of becoming HIV infected. The variety of social and structural factors, including gender inequality, human rights violations, stigma and discrimination, poverty, and lack of HIV awareness and access to education, health, and other services, increase people's vulnerability to HIV infection and dive the HIV epidemics (UNAIDS, 2010).

Many behavioral contributors that increase or decrease the risk of HIV infection have been explored and identified. These contextual factors combine in dynamic ways to increase behavioral risk. However, the contextual risk factors and their casual relationships with HIV risk behaviors are still not well understood. This limited understanding is an obstacle for developing effective behavioral interventions to prevent or reduce HIV risk–associated behaviors.

Several health behavior theories, such as the Social Cognitive Theory (Bandura, 1994), the Health Belief Model (Rosenstock, 1974), the AIDS Risk Reduction Model (Catania, Kegeles, & Coates, 1990), and the Theory of Reasoned Action (Ajzen & Fishbein, 1980), have suggested possible mechanisms and have been popularly used in the understanding and prevention of HIV-related risk behaviors. Most of the cognitive-behavioral interventions that stem from these theories report effectiveness in reducing risk of HIV infection. Strong evidence has shown that cognitive functions, such as self-efficacy, uniquely contribute to the rationale of the safer sexual behaviors and especially in the domain of condom use. The robust association between self-efficacy and practices of safer sexual behaviors had been revealed among people with different cultural background and across countries. In addition to the findings revealed in research participants from Western cultures, African cultures, and Hispanic culture, higher level of HIV/AIDS preventive self-efficacy was also found to be significantly related to less HIV/AIDS-related risky sexual behaviors among people in Asian countries (Lee, Salman, & Fitzpatrick, 2010).

Numerous experts have contributed to research in this field since the beginning of the HIV epidemic. Research has indicated that some behavioral preventive efforts have slowly but effectively reduced HIV prevalence across the world. An extensive body of research has provided noteworthy information on strategies to facilitate or sustain behavioral changes for HIV preventions. However, to effectively oppose health disparities in HIV prevention and care, many researchers have suggested that it is critical to address cultural issues in delivering HIV/AIDS intervention programs to achieve maximum effectiveness (Faryna & Morales, 2000; Jemmott, Maula, & Bush, 1999). Because of their vulnerability of accessing health services and specific cultural backgrounds, ethnic minority and immigrants are one of the target populations for conducting HIV prevention research and interventional program. Recruiting participants with different ethnic or cultural backgrounds in HIV research to enhance our understanding and capability against HIV epidemic is essential; however, it is challenging. The existing number of research conducted to understand HIV risk behaviors and effective preventions in this population is very limited. Few researchers have identified barriers and facilitators of recruiting ethnic minorities to HIV-related research in hopes to provide fundamental information for future development of cultural sensitive HIV interventional programs (Jemmott et al., 1999; Lee, Salman, & Wang, 2010).

When examining the effectiveness of an intervention, measurement issues regarding the indications of the HIV risk behaviors are especially important. Because of its complex nature, HIV risk behaviors are measured variously by researchers in terms of content and form. In most of the existing correlational studies, HIV risk behaviors were measured using "relative frequency" data collected through Likert scales or "count data," which provided the accurate number of behavioral events used in interventional studies (Schroder, Carey, &Vanable, 2003). The "condom use" measure is the most frequently used indicator for HIV risk behaviors in many related behavioral studies. Many interventional programs also focus on improving the constant condom use.

The critical priorities of research related to HIV risk behavior are in concerns with the goals of reducing HIV incidence, increasing access to care and optimizing health outcomes, and reducing HIV-related health disparities (NIH Office of AIDS Research [OAR], 2010). To understand how to change behaviors and maintain adopted protective behaviors for reducing HIV risks, studies to investigate biological behavioral interactions and social dynamics on changes of HIV risk behaviors are needed (OAR, 2010). It is a continuing need to conduct HIV/AIDS-related research at the community level and within specific populations (e.g., women, racial and ethnic populations, men who have sex with men [MSM], homeless people, people affected with psychiatric disorders, and drug users). Longitudinal and multivariate studies to detect causal relationships and the changing patterns of HIV risk behaviors and research are needed. Studies to test behavioral interventions for significant populations and to increase retention, recruitment, and adherence to procedure for HIV prevention are necessary as well. Methodological issues, including criterion measures, validity of self-report risk behaviors, measures of drug use, culturally and linguistically appropriate measurement tools, comparability, and generalizability of studies, need special consideration. Studies that integrate behavioral, social, and biological measures and develop improved methodologies for data collection including improvement of sampling, measurement of risk factors, and evaluation of outcomes are considered in an urgent need. Research that develops new approaches to address underrepresented or difficult-to-reach populations in interventional studies are one top priority for future research on HIV prevention as well (OAR, 2010).

Bridges between research, theory, practice, and policy as well as with other disciplines must be built. Future nursing studies in this field are suggested to include biological markers that can bolster the validity of the studies and to include various cultural populations. Developing a specific HIV risk behavioral reduction theory from the nursing perspective will be useful and efficacious for nurses to apply to the reduction of HIV risk behaviors.

Yi-Hui Lee
Ali Salman

HIV SYMPTOM MANAGEMENT AND QUALITY OF LIFE

Persons living with human immunodeficiency virus (HIV) and receiving antiretroviral (ARV) therapy often experience severe physical, psychological and cognitive symptoms (Wantland et al., 2008). ARV therapy has also resulted in anthropomorphic and metabolic complications such as body fat distribution abnormalities, lactic academia, insulin resistance, and bone disease (Corless et al., 2005). Patients with untreated HIV infection frequently experience CD4$^+$ immunity incapacitation, causing viral spread and development of opportunistic infections. However, for patients receiving ARV, the more pervasive challenges may be the advent of unwanted side effects that can trigger anxiety and depressive symptoms and lead to medication nonadherence (Wantland et al., 2008). Other researchers concur that symptoms (e.g., nausea, diarrhea, fatigue, depression, and confusion) often have profound effects on daily activities and medication adherence, further exacerbating the negative impact on health-related quality of life (HRQOL; Hudson, Kirksey, & Holzemer, 2004; Hughes, 2004; Kremer, Ironson, & Porr, 2009). Symptom management, including providing clients with avenues to explore self-care strategies, has become a significant part of the health care provider's role. The focus of this chapter is to provide information about select aspects of the symptom experience; the effects of ARV therapy, comorbidities, and opportunistic infections upon HRQOL; and the symptom management strategies for those living with HIV/AIDS.

Merriam-Webster (2010) defines a *symptom* as "subjective evidence of disease or physical disturbance." Symptom management is "care given to improve the quality of life of patients who have a serious or life-threatening disease. The goal of symptom management is to prevent or treat as early as possible the symptoms of a disease, side effects caused by treatment of a disease, and psychological, social, and spiritual problems related to a disease or its treatment" (National Cancer Institute, 2010). *Quality of life* is a term defined as a patient's general well-being, including mental status, stress level, sexual function, and self-perceived health status (Stedman's Medical Dictionary for the Health Professions and Nursing, 2005, p. 1233).

Initial reports of HIV began to occur in the early 1980s, with the most frequently cited opportunistic infections being *Pneumocystis carinii* pneumonia and Kaposi's sarcoma. The development of more advanced medication regimes (e.g., ARV) in the mid-1990s resulted in the evolution of HIV into a chronic illness (Spirig, Moody, Battegay, & Geest, 2005). However, despite care innovations and prospects for longer term survival, individuals with HIV infection continue to experience a plethora of medication side effects, comorbidities, and opportunistic diseases. Consequently, medication nonadherence continues to be pervasive and often results in exacerbation of symptoms and development of resistant strains of the virus. Kremer et al. (2009) cited "the decision to take antiretroviral therapy requires a long-term commitment, because patients interrupting antiretroviral therapy compared to those continuing were at increased risk of death, cardiovascular disease, metabolic effects, and immune activation during viral rebound" (p. 127).

The literature is replete with citations regarding how health care providers can optimally manage the care of HIV-infected patients. As patients have become more Internet savvy and increasingly incorporate self-managed complementary modalities, the need for additional patient-friendly resources has emerged. The International HIV/AIDS Nursing Research Network, based at the University of California at San Francisco (UCSF) School of Nursing, devised a handbook in 2004 titled *The HIV/AIDS Symptom Management Manual*. Information on 21 commonly occurring symptoms was validated by clinicians working in HIV care and corroborated by participants in several Network-directed research studies around the world (Wantland et al., 2008). The manual is available for free download at http://www.aidsnursingucsf.org. Because of the vast numbers of symptoms and management complexities, our discussion within this chapter will be limited to one primary symptom and its associations with other frequently reported sequelae. Lipodystrophy (now more commonly referred to as body fat redistribution) emerged following the inception of ARV therapies (e.g., nucleoside reverse transcriptase inhibitors and protease inhibitors). Reports of lipoatrophy (e.g., peripheral fat loss of the face, extremities and buttocks) in HIV-infected persons have ranged from 28% to 37% (Bernasconi et al., 2002; Santos et al., 2005). In a related study, 27% of study participants (*N* = 745) reported lipohypertrophic manifestations like breast enlargement, central hypertrophy, and buffalo hump (Heath et al., 2002). These body fat changes have frequently caused increased stigma and diminished HRQOL, often resulting in self-image dysmorphia, development of depressive symptoms, and nonadherence to treatment regimens (Rajagopalan, Laitinen, & Dietz, 2008).

Corless et al. (2005) conducted a descriptive, exploratory study (*N* = 165) to examine relationships between the presence of lipodystrophic and depressive symptoms, social support, quality of life, comorbidities, and ARV adherence. Patients experiencing HIV medication-related body fat changes were only “moderately adherent” (p. 582) to ARV therapy, with as many as 57.6% admitting forgetting to take their medications, or intentionally failing to adhere to the prescribed regimen. Sixty-seven percent of the sample reported comorbidities, with depression, diabetes, hepatitis, and hypertension occurring most frequently. More than 80% of the respondents indicated significant levels of depressive symptoms, as measured by the Center of Epidemiological Studies Depression Scale (Radloff, 1977). There was also a significant relationship between the Center of Epidemiological Studies Depression Scale scores and medication nonadherence ($r = .275$, $p = .001$). Participants with other medical conditions demonstrated significant relationships with adherence and quality of life ($r = .495$, $p = .002$). This study suggested that body dysmorphia, adherence to ARV regimen, and diminished HRQOL are perceived as significant problems in persons with body fat redistribution changes associated with HIV.

It is challenging to provide a detailed presentation of HIV-related symptoms and the resulting sequelae within the confines of this chapter. Although the symptoms initially associated with HIV (e.g., Kaposi’s sarcoma, *P. carinii* pneumonia) now appear less frequently, the advent of ARV therapy has resulted in new symptom presence that can be as troubling as those found decades ago. Symptoms like nausea, diarrhea, and fever still persist; however, entities like lipodystrophy have emerged as more contemporary issues. The results can often be the same as those observed in the early 1980s. Individuals living with HIV/AIDS continue to experience anxiety and self-image disturbances associated with comorbidities, medication side effects, and body fat changes. These factors can impact daily activities, affect medication adherence, result in increased depressive symptom presence, enhance disease-related stigmata, and decrease HRQOL. Rajagopalan et al. (2008) reported similar findings regarding significant reductions in HRQOL in persons experiencing lipoatrophy. They also noted that “HIV-infected individuals experience a considerable reduction in health-related quality of life compared to the general population” (p. 1201).

It is imperative that we continue to reshape symptom management programs for persons living with and affected by HIV/AIDS. Nurses are well positioned to assist clients with symptom management, particularly self-care measures that have been validated through numerous scientific studies and opinions of clinical experts in the field of HIV. Spirig et al. (2005) suggested that “nurses and researchers work together to better understand patients’ social systems, symptom experiences, adherence levels to therapeutic regimens, and overall quality of life” (p. 342).

Kenn M. Kirksey
Gayle McGlory

HOME CARE TECHNOLOGIES

The Office of Technology Assessment, in a 1987 memorandum to the U.S. Congress, described a technology-dependent person as one who needs both an ongoing nursing care and a medical device to compensate for loss of a vital body function, to sustain life, and to avert death or further disability. Home care technologies include mechanical ventilation; apnea detection monitoring; oxygen assist; continuous positive airway pressure; nutrition or hydration via central venous infusion; hemodialysis and peritoneal dialysis; spinal infusion for pain; vascular infusions for chemotherapy, insulin, or antibiotics; automatic internal cardiac defibrillation; and left-ventrical heart assist devises (Smith, 2009). Both technology devices and information technology systems (Internet, cell phones, or telehealth) are involved in home care technologies. Information technology is used to provide guides for assisting families in managing home care technology treatments and in supporting health care practitioners' and patients' visual and audio communications (Piamjarakul & Smith, 2007; Yadrich & Smith, 2008). Modern informatics technology can achieve the goal of "establishing access to information about home technology care and overcome the discontinuity between inpatient and home care setting."

The latest area of home technology development is assistance by robots, which can remind patients about treatment schedules, medications, and even assist in walking (Czaja & Schulz, 2006; Pollack et al., 2002). In addition, there are now "smart" homes for frail elders (Pollack et al., 2010). Smart homes are wired with sensors to detect motion and thus monitor safety of activities in the home, such as overuse of stoves and alert emergency services (Matthews, 2006; Rialle, Duchene, Noury, Bajolle, & Dermongeot, 2002).

Studies verify that various home care technologies lead to added length and quality of life for patients and that families overwhelmingly want these devises and informatics in their home (Smith, 1999, 2007). A common requirement for placing complex technological equipment in the home is that a competent and willing caregiver is available to manage the equipment before treatment (such as home parenteral nutrition therapy). Technology caregiving resembles a miniature, urgent care center where families provide complex, direct patient care, maintain equipment and supply inventories, obtain needed home services, negotiate for reimbursement, and manage caregiver problems of fatigue (Czaja & Schulz, 2006; Day, Demiris, Oliver, Courtney, & Hensel, 2007). With both medical devise and informatics home care technologies, a family can provide the patient with daily nursing care, makes complex decisions about treatments, and learns skills in managing machines and informatic connections (Matthew, 2006, Morgan, 2004).

Nursing research has contributed to study of home care technologies findings in several areas (Smith, 2009). Smith (1995) has a series of studies on families, caregivers, and patients dependent on technology for lifelong survival (Smith et al., 2002). The ethical issues in technological home care were summarized and research questions posed in a Hastings Center report (Arras, 1994, Arthur, Pang, & Wong, 2001). Family members reported being ill-prepared for technology caregiving (Smith, 2008), and little has been done to support caregivers with their long-term daily technology care (Smith, 2007; Smith, Mintz, & Caplan, 1996).

Research with home care technologies should be systems oriented on a variety of levels: machine reliability and safety, compensated physiological systems, family caregiving, community support, health care providers, and third-party payers' reimbursement (Noel, Vogel, Erdos, Cornwall, & Levin, 2004). The most extensive research has been at the machine or device level, including manufacturers' studies of the mechanical system that has led to Food and Drug Administration's approval for clinical trials conducted by nurses. Government regulation also has called for research on the manuals accompanying devices to determine readability and effectiveness of instructions for laypersons.

In 1996, the National Academy of Science presented a report to the Congress from manufacturers, regulators, health professionals, families, and patients regarding findings from research on safety and issues of home technologies and family care. Problems to be studied included the impact of family caregiver quality of life (Smith, Hunt, Czaja, Juhn, & Kelly, 2002), the ethical decision making in use of technologies, the costs of safety regulations for manufacturers, and the quality control measures for home care (Schulz, Lustig, Hondler, & Martire, 2002). Problems to be studied included the impact of technologies on patients and family caregivers' quality of life, ethical decision making in use of technologies, costs of safety regulations for all technologies, and quality control measures for home devises.

Major conclusions from research are that home care technologies enhance and extend quality of life for those who would otherwise succumb to illness, frailty, or disability. Further, family members are very capable and desirous of home care for their technology-dependent loved one. Direct physical care and indirect costs (reduced income, innumerable expenses, and transportation fees) are shifted to the family, and evidence of emotional and physical strain occurs in family caregivers. Delivery of technology services in home care is costly and uncoordinated, although cost savings and quality improvements occurred when models of comprehensive care were followed. In some communities and states and in some populations of patients (e.g., ventilator dependent), coordinated technology care services do exist.

The Agency for Healthcare Research and Quality commissioned two Technology Assessment Reports in 2001 and in 2006 to review the efficacy-based studies of telecare technology (HMR, 2007). Telecare Outcomes of both published reviews are that there is strong evidence indicating the benefits of home telecare for home chronic disease management and growth in these services. Picture phone use for hospice care has been well received by caregivers and verified as cost effective, although social workers have found it is underused (Glasgow, 2007).

A Cochrane review of seven clinical trials concluded that picture phones were reliable, well accepted by patients and family, and without detrimental effects but that clinical outcomes and cost research was lacking (Collins, Murphy, & Strecher, 2007; Currell, Urquhart, Wainwright, & Lewis, 2001; Lytle, 2002). Clinical trials of in-home picture phone visits by nurses found significant improvement in treatment adherence in an older population at costs much lower than delivering traditional home nursing visits (Smith, Dauz, Clements, Cook, & Doolittle, 2006).

Recently summarized clinical trials data identified several efficacious Internet-based interventions related to chronic disease patient education, interactive support, treatment follow-up, and home problem management guides (Glasgow, 2007). Effective informatics technology interventions such as step-by-step algorithms for guiding daily technology procedures, video scene illustrations of technologic health care equipment assembly, and contacts between health professionals and families have been successful (Smith, 2011; Smith et al., 2005).

Future directions for research include the need for continued study of informatics technologies that can support safe, optimal care. In addition, all informatics technologies themselves must be continuously tested for ease of use. Study of interventions for technology home care in culturally diverse populations is still needed (Smith, 2008). In addition, policy, ethical, professional, and interdisciplinary areas of regulation and safety issues should be researched to reduce duplication and enhance resource availability (Smith et al., 1996). Predicting cost and outcomes of care should be compared with patients' health outcomes and families' desired quality of life. Consumer demand and technological advances will continue, one hopes, with nursing research verifying theoretical frameworks that guide effective home and informatics technology.

Carol E. Smith

HOME HEALTH CLASSIFICATION SYSTEMS

Home health systems are computer-based information systems designed to support care of the sick in the home. Home health systems primarily support home health and hospice programs provided by home health agencies (HHAs). Home health is more than "care in the home." Home care practitioners offer continuity of care from the hospital to the community. They also use public health concepts of disease prevention and health promotion and coordinate the services of multiple providers, vendors, and community agencies that may be involved in the care of an individual or family.

Home care is the oldest form of health care and yet the newest. Home health nursing, previously called care of the sick in the home, is one of the earliest developments in the field of public and community health. Care of the sick at home traditionally has been provided by voluntary nonprofit agencies, such as visiting nurse associations (VNAs). These agencies were organized to provide out-of-hospital services primarily to those who were sick and poor. In 1885, the first VNA in the United States opened its doors in Buffalo, New York (Maurer & Smith, 2009).

In 1966, with the introduction of Medicare and Medicaid legislation, home health programs emerged from hospitals, ambulatory care facilities, and health maintenance organizations as stand-alone businesses. The programs and providers increased in number and size. They increased faster than all other organized providers in the health care industry because Medicare primarily addressed the health care needs of the aging population. As this population grew, more health services were required, resulting in an increase of health care costs that required cost containment. As a result, health care began to shift from acute short-term hospital care to community home-based and chronic long-term care. Patients began to be discharged "sicker and quicker" and required more health care services in the home.

Home health systems were initially introduced as management information systems designed to manage the flow of information in the proper time frame and to assist in the decision-making process. The early home health systems were introduced in large VNAs and other nonprofit HHAs as billing and financial systems. They were developed for the sole purpose of improving cash flow, holding down costs, and addressing the federal regulatory requirements for HHAs. They were designed to furnish the information necessary to obtain reimbursement for services from Medicare, Medicaid, and other third-party payers.

Home health systems generally were developed by commercial vendors who obtained the computer system hardware and developed the software to process the services data provided by the HHAs. The computer vendors owned the home health system and were responsible for maintaining and updating them. Home health computer vendors were usually contracted by the HHAs to provide billing services and financial management, without the HHAs having to develop their own system. With the introduction of the microcomputer and online communication systems, local area networks and wide area networks were introduced, designed to advance and enhance the home health systems. They were used to link state and local units, to share hardware and software, and to integrate data (Saba & McCormick, 1996).

Over time, home health systems have been designed not only to collect and process home health data required by governmental and private third-party payers for reimbursement for patient services but also for the efficient management of the HHA. Billing and financial applications include general ledger, accounts receivable, accounts payable, billing, reimbursement management, and cash management. Operations management applications, such as scheduling, patient census, visit tracking, cost statistics, utilization reports, accounting statements, and discharge summaries have been developed and refined.

Newer home health systems have emerged that are designed to focus on the patient encounter and visit during an episode of care. They include clinical applications used to assess and document the care process, to generate care plans, and to prepare critical pathways or protocols that outline critical events. These newer systems have the capacity to communicate patient information for continuity of care from hospital to the home, to the community, and back to the hospital. The systems also offer other applications that focus on decision support, evaluation of care, and measurement of outcomes across settings, time, and geographic locations. The systems are considered part of the lifelong longitudinal record containing patient-specific health-related data.

Stolee, Steeves, Glenny, and Filsinger (2010) researched facilitators and barriers to use of home health systems. Limited research about home health systems inspired their effort. In conducting their research, they noted lack of clarity about definitions and use of terminology for the many forms of electronic systems now being used in HHAs. The most commonly identified facilitators of home health systems were portability of technology, opportunity for improved data entry accuracy, management support, and incentives for users. Barriers to successful implementation of home health systems centered on cost and training requirements.

The literature about home care systems tends to be more discussion- than data-base focused, with authors presenting their experiences and lessons learned. Crossen-Sills, Toomey, and Doherty (2009) recount the transformation of a nearly century old VNA into a technological leader. Their successful journey with home health systems implementation was guided by attention to the mission of the organization as well as benefits to their home health patients. Home health systems integration has been addressed by hospital- and health system–based HHAs. Inpatient electronic patient care information systems include home health applications for seamless integration of patient care records and collaborative care among health care professionals from home health, inpatient, and ambulatory care settings.

The U.S. Department of Veterans Affairs, a recognized leader in technology and patient care systems, has turned its attention to home health systems. Recognition of the needs of the aging veteran population has resulted in an increasing focus on home health care and associated technologies. The Veterans Affairs' computerized patient record system offers a well-integrated system for care coordination and conferences for home care staff and other health care providers. Their Community Care Coordination Service (Kobb, Hilsen, & Ryan, 2003) uses multiple technologies to maximize care coordination and patient satisfaction as well as to identify best practices for veterans with chronic health conditions. One element of Community Care Coordination Service, home telehealth, also has gained widespread acceptance among home health patients and providers in a variety of settings, especially rural locales.

Home health systems are expected to enjoy growing recognition and utilization in the future. These increasingly sophisticated systems will be refined and improved as the population of the United States ages, the needs for home health care swell, and the health care system continues to evolve.

Sandra Sojka

HOME HEALTH SYSTEMS

Home health systems primarily support home health and hospice programs provided by home health agencies (HHAs). Home health is more than "care in the home." It focuses on the continuity of care from the hospital to the community, public health concepts of disease prevention and health promotion, and out-of-hospital acute illness services.

Home care is the oldest form of health care and yet the newest. Home health nursing, previously called care of the sick in the home, is one of the earliest developments in the field of public and community health. Care of the sick at home traditionally has been provided by voluntary nonprofit agencies, such as visiting nurse associations, organized to provide out-of-hospital services (Martinson, Widmer, & Portillo, 2002). However, care is now also provided by profit-based organizations.

The systems involved in the delivery of patient care in the home have changed since 1883 when Lillian Wald established the first home health nursing agency in the United States (Martinson et al., 2002). However, the principles that guide home care continue to be holistic and focused on helping people remain in their homes despite or following a serious or acute illness or condition. In the beginning, services were provided as charity to the poor. Today, in many HHAs, provision is made for a small group of people who do not have insurance and who cannot afford fee-for-service care. However, visits are usually very limited, and patients are provided with resources to help them once they are discharged from the agency.

In 1966, after Medicare and Medicaid legislation were introduced, home health programs began to increase in number and in size. They increased faster than all other organized providers in the health care industry because Medicare primarily addressed the health care needs of the aging population. As this population grew, more health services were required, resulting in an increase of health care costs that required cost containment. As a result, health care began to shift from acute short-term hospital care to community home-based and chronic long-term care. Patients began to be discharged from inpatient settings "sicker and quicker" and required more health care services in the home.

As the number and type of HHA increased, technological systems were needed to manage the flow of information in the proper time frame and to assist in the decision-making process. They were designed to furnish the information required for payment by Medicare, Medicaid, and other third-party payers for reimbursement for services. They were developed for the sole purpose of improving cash flow, holding down costs, and addressing the federal regulatory needs for HHAs.

Systems were generally developed by commercial vendors who obtained the computer system hardware and developed the software to process the services data provided by the HHAs. The computer vendors owned the home health system and were responsible for maintaining and updating them. Home health computer vendors were usually contracted by the HHAs to provide billing services and financial management, without the HHAs having to develop their own system. With the introduction of the microcomputer and online communication systems, local area networks and wide area networks were introduced, designed to advance and enhance the home health systems. They were used to link state and local units, to share hardware and software, and to integrate information.

These systems are designed not only to collect and process home health data required by the federal government and third-party payers for reimbursement of services but also for the efficient management of the HHA. They focus on billing and financial applications, such as general ledger, accounts receivable, accounts payable, billing, reimbursement management, and cash management. They also may include other management applications, such as scheduling, patient census, visit tracking, cost statistics, utilization reports, accounting statements, and discharge summaries.

Newer technological systems have emerged that are designed to focus on the patient encounter and visit during an episode of care. They include clinical applications used to assess and document the care process, to generate care plans, and to prepare critical pathways or protocols that outline the critical events. These newer systems are using the electronic information superhighway to communicate patient information for continuity of care from hospital to the home, to the community, and back to the hospital. The systems also offer other applications that focus on decision support, evaluation of care, and measurement of outcomes across settings, time, and geographic locations. The systems are considered part of the lifelong longitudinal record containing patient-specific health-related data.

Tele-health home monitoring systems are being used with increasing frequency to monitor the status of patients who reside in remote locations or who need frequent supervision. These systems vary and include their own manufacturer guidelines. However, criteria for patient enrollment are fairly consistent, such as the ability of the patient to physically and cognitively participate in the program, a safe home environment, a predicted extended stay on service, a useable phone system, and a willing caregiver. Staff, patients, and caregivers must receive training in the use of the equipment (Visiting Nurse Associations of America, 2008–2009). The Outcomes Assessment and Set emerged in an attempt to accurately assess the home health patient's status on admission to home care and at various intervals throughout the home care stay. The data gleaned are used by Medicare, Medicaid, and private insurances to determine reimbursement for home visits. The Outcomes Assessment and Set includes several versions of forms that include questions ranging from functional ability to wound status and more.

As more nurses have moved into home care settings, they are often finding themselves overwhelmed, especially if they have previously worked only in inpatient settings. Home care is unstructured, and the nurse is often called on to make autonomous decisions. A research-based theory of home health nursing (Neal, 1999; Neal-Boylan, 2009) was developed to help nurses and administrators understand the characteristics needed to be a successful home health nurse and to help guide nurses new to home care as they transition.

Home health has increasingly become the focus of myriad research studies as researchers strive to discover how to retain home health nurses given an environment of increased demand and complicated expectations regarding documentation. Researchers are also evaluating home health nursing practices to determine whether they are evidence-based and protect the patient and the nurse in the home environment.

Leslie Neal-Boylan

HOMELESS HEALTH

The global economic recession and the continuing ongoing declared and undeclared wars have caused a marked increase in the number of homeless people worldwide. Homelessness is a complex phenomenon that has many intersecting causes: historical, social, economic, political, and educational; but regardless of the cause, the loss of "your" home and its connections with your life is a major stressful assault on the personal identity of individuals, families, and population subgroups.

The impact of this disruption in health increases dramatically when a person becomes homeless. These detrimental effects include diminished mental and physical health (Savage, Lindsell, Gillespie, Lee, & Corbin, 2008), lack of access to both preventive (Bonin, Fournier, Blais, Perreault,

& White, 2010), acute and chronic health services (Gelberg et al., 2009), diminished ability to resist high-risk drug and sexual behaviors (Hudson et al., 2009; Stein, Nyamathi, & Zane, 2009), and increased vulnerability to both injury through violence (Busen & Engebretson, 2008; Johnson, Rew, & Kouzekanani, 2006) and most importantly mortality. The life expectancy of the homeless is shorter than for their housed counterparts. In the *Dying Without Dignity: Homeless Deaths in Los Angeles County 2000–2007* Report, life expectancy was reported as 36% shorter on average and 49% shorter for Latina females (Hawke, Davis, & Erlenbusch, 2007). A similar 5-year study in Scotland concluded that "homelessness is an independent risk factor for deaths from specific causes" (Morrison, 2009).

Previous research in this area is not robust. The homeless are complex, vulnerable, mobile, difficult populations to study and resources are scarce. Consequently, many of the published studies have been poorly funded, descriptive in nature, and use small convenience samples in nonexperimental designs. The NIH-funded studies focus on the mentally ill and substance abusers (Zerger, 2005).

Nurses historically have been on the frontlines of caring, advocating, and conducting research on the health of the homeless. Since 2005, the panorama of nursing homeless health research has expanded in both breadth and depth. Homelessness is a worldwide phenomenon. Recent nursing research reflects this fact with publications from South Korea, Australia, Nigeria, Pakistan, Nepal, Japan, England, Australia, South Africa, and Canada. Although the majority of nursing research studies are authored by U.S. researchers, multicultural and international studies provide insights into homeless health issues, which reveal both the universal and the unique cultural aspects of homelessness and health (Lee, 2008).

The expanding depth of nursing research is shown in (1) the new directions of inquiry; (2) the wider use of various research tools: methodologies, instruments, and designs; and (3) the new subpopulations studied: elderly (Joyce & Limbos, 2009), youth (Haldenby, Berman, & Forchuk, 2007; Stewart, Reutter, & Letourneau, 2007), runaways (Martinez, 2006), teen moms (Meadows-Oliver, 2006a, 2006b; Meadows-Oliver, Sadler, Swartz, & Ryan-Krause, 2007), and those transitioning from homeless to housed (Drury, 2008; Heliker & Scholler-Jaquish, 2006; Montgomery et al., 2008).

Although mental health and drug abuse issues are still a research interest, studies now are directed toward understanding the "bigger picture" by focusing on environmental and other barriers to treatment (Forchuk, Brown, Schofield, & Jensen, 2008) and the use of preventive health services rather than targeting individual abuse/rehab issues (Darbyshire, Muir-Cochrane, Fereday, Jureidini, & Drummond, 2006). The studies now span the continuum from identifying objective and subjective factors that facilitate individual participation in hepatitis vaccination (Stein & Nyamathi, 2010) and latent tuberculosis treatment (Nyamathi, Christiani, Nahid, Gregerson, & Leake, 2006; Nyamathi et al., 2008) to cost analyses of various nurse managed care intervention treatment programs (Greengold et al., 2009; Larimer et al., 2009).

An evolving new direction of research is toward seeking the perspectives of homeless individuals regarding concrete topics related to their personal health and health status (Anthony & Barry, 2009; Daiski, 2007; Gelberg et al., 2008), access to and utilization of care (DiMarco, 2007; Forchuk et al., 2008), health care provider experiences (Hudson, Nyamathi, & Sweat, 2008), and experiences of caring for children while homeless (Meadows-Oliver, 2006a, 2009). Studies on more esoteric topics such as the personal meaning of becoming homeless (Finfgeld-Connett, 2010), discovering personal strengths living in an abuse shelter (Hemphill, 2005), being uprooted and dislocated (Berman et al., 2009), and social support (Meadows-Oliver, 2005) are also emerging. These insights will facilitate better understanding of the homeless and more relevant research interventions.

Few new validated instruments for homeless health research have been developed. However, one new instrument, the CCH Consumer Outcome Scales, is promising. It measures six major areas of homeless functioning (housing, employment, benefits, medical, medical health, and substance abuse) and includes three outcome scales related to homeless health (Cook, Farrell, & Perlman, 2007). This instrument may facilitate larger studies comparing the health of homeless groups nationally.

Chiu and DiMarco (2010) report a novel use of instruments to assess the growth and development of preschool homeless sheltered children. Their study compared the results of a nurse administered Denver Developmental Screening Test II and the mother's assessment of her child using the Ages and Stages Questionnaires instrument. They report a high degree of comparability (95%) for nurses and mothers in both gross motor assessment and personal social development and 67% comparability in language development assessment. Although a small study, this may be a new way for both easier and earlier identification of developmental delays in homeless children and foster more parent educational support. This study needs to be replicated with a larger population.

In summary, nursing homeless health research is more diversified than ever with recent publications from five of the six continents. Most of the studies are small and descriptive, use convenience samples, and are not theory based. Research using ethnographical-phenomenological study frameworks (Hubbert, 2005; Martins, 2008; Meadows-Oliver, 2006b; Hunt, 2007) and meta-synthesis (Meadows-Oliver, 2006b) have increased.

The future direction of homeless health research will be shaped by (1) the Patient Protection and Affordable Health Care Act (HR3590) of 2010, (2) the economics of health care, (3) the increasing use of technology, and (4) the Housing First movement. These factors are directed at changing the health of the homeless by preventing the occurrence of homelessness and by making rapid stable rehousing the primary care focus. This will change the direction of research on homeless health funding.

Future funding opportunities will focus on new preventive and alternate care modalities such as medical respite (public and private; Zerger, 2005), innovative care management models (cooperative, case management, and care via assistive technologies—cell phones, Health Buddy; Zimmerman & Barnason, 2007), and remote visualization (Ludden, 2010). Documentation of quality care, cost analyses, and tracking efficiencies (Larimer et al., 2009) will dominate future research funding decisions.

Mary J. McNamee
Marilyn Wegehaupt

HOSPICE

Hospice research in the United States began with studies of the differences between hospice care and care received in traditional settings for the terminally ill. Although these studies examined the impact of care provided by hospice, largely nursing care, such studies were not nursing research. In Canada, Mary Vachon, a U.S.-trained nurse, was invited by the palliative care team at the Royal Victoria Hospital in Montreal, Canada, to investigate stress in the caregivers who composed the palliative care team. Other researchers examined pain pathways, medications for pain, and the impact of music therapy. In England, Dame Cicely Saunders, trained as a physician, social worker, and nurse, and others examined the impact of medications for symptom relief. These early studies had as their focus the improvement of care of the dying and, in the United States, the evaluation of whether hospice care improved such care and was fiscally sound so as to be worthy of a new benefit to fund such care. These studies were conducted by researchers from a number of disciplines.

Nursing research about hospice has been conducted using a variety of methodological approaches including qualitative ones—ethnography, observations, semistructured interviews, and interviews—and quantitative ones—quasi-experimental, questionnaires/surveys, and audit as well as a combination of methods. Research about hospice covers an array of topics. Topics include organizational methodologies, demographic data, social support, physiological, psychosocial, and spiritual issues, self-care, how patients spend their time, grief, bereavement, studies of nurses and their knowledge, and the impact of hospice care. Some of these topics use hospice as a setting for research but are not about hospice per se. Topics for such studies include an examination of cancer pain in home hospice patients, a comparison of nurses' knowledge about AIDS by practice setting, training, and educational programs where the focus is the program and not the hospice patients and nurses, and the grief experience of older women. In this case, the husbands had received hospice care, but that was not the focus of the study. Indeed the researcher suggested that a future study might compare the experience of women whose husbands had received such care and those who had not (Jacob, 1996). A similar study in Finland examined the adjustment of relatives after the death of a hospice patient. Again the focus was on the adjustment and not the differential impact of the hospice program on such adjustment. An examination of the relationship between depressive symptoms and symptom distress in patients with cancer who are newly admitted to hospice home care does not compare the effect of settings on the variables of interest. Rather, hospice home care is irrelevant to the analysis (McMillan & Rivera, 2009).

In an attempt to validate the impact of a hospice palliative care unit on perceived family satisfaction and to examine the demographics of patients, Kellar, Martinez, Finis, Bolgar, and von Gunten (1996) surveyed 240 families of patients of the program. The most frequent response to an opened-ended question about the advantage of the program was the professional nursing care. Few remarks were made about disadvantages, and these had to do with the parking facility expenses, the distance families had to travel, and the potential for patient transfer because of the facility's designation as an acute-care facility. Of the 92 eligible surveys returned, the researchers found that 88% (81/92) considered the hospice to be very helpful to the patient, 9% (8/92) found the program to be helpful, and 1% (1/92) were neutral. This type of study is representative of a host of studies conducted by hospice programs to assess their audience and the satisfaction with the program.

Hospice referral remains crucial to the viability of such programs. Although interest is usually expressed in the attitudes of physicians, Schim, Jackson, Seely, Gruinow, and Baker (2000) examined the attitudes of home care nurses to hospice referral. Attitudes of 160 nurses were assessed with a 15-item survey that was completed by 75 nurses for a response rate of 46.9%. Home care nurses saw little difference between home care and hospice services. Many (42.6%) of the respondents thought insurance with a hospice benefit was necessary for referral. These and other misperceptions underscored the importance of home care nurses understanding the requirements and components of hospice care. The importance of attitudes as well as knowledge was underscored by a study investigating the factors that increased the likelihood that nurses would discuss terminal illness care and hospice care with patients and families. Cramer, McCorkle, Cherlin, Johnson-Hurzeler, and Bradley (2003) found that prior experience with hospice, greater knowledge, and religiosity as well as greater comfort in initiating such discussions were related to their initiation by nurses.

Length of survival in hospice continues to be an area of concern given that referrals are often made closer to the death of the patient. Younnis and colleagues in a study of 180 patients with cancer referred from a comprehensive cancer center found that both low Palliative Performance Scores and male gender were associated with shorter lengths of stay. Although participation in prior clinical trials did not affect the results of this retrospective study, the authors note the importance of a prospective study to investigate the impact of clinical trial participation on length of hospice stay.

The factors that affect whether a certified Medicare hospice is present in a rural community were examined by Campbell, Merwin, and Yan (2009). They found that rural communities were less likely to have a Medicare-certified hospice. The higher the rate of physicians in the area, however, the more likely a Medicare-certified hospice would be present. The authors note that the requirement of the Medicare hospice benefit for physician certification of terminal illness may constitute a barrier to the presence of hospices in rural areas, an absence that may impede quality end-of-life care for residents of rural areas.

Volunteers constitute an important programmatic aspect of hospice. In a study of 32 hospices in the southwestern United States, 351 volunteers responded to a mailed survey (Planalp & Trost, 2009). Their motivation for volunteering included helping others and learning, fostering social relationships, feeling better, and pursuing career goals. Age had an impact on these motivations with younger volunteers being more career oriented and older volunteers more socially oriented.

Another example of program-related research is a study on patient-focused menu planning (Fairtlough & Closs, 1996). Over a 4-week period, 108 interviews were conducted related to specific meals. Foods not liked included those difficult to swallow, tough or fried foods, or those with bones. Patients indicated they wanted seafood including salmon and prawns, beef, Yorkshire puddings, yogurt, eggs, fruit juices, and beer. Three major comments concerned the size of the portions (too large), the foods not the right temperature (not hot enough), and the time of food service (preferred later in the day). This study, although used to help nurses understand the research process, had an impact on patient care in the facility where the research was conducted. Although not commented on by the authors, it would be helpful in future research if a larger sample of patients were included in the study where closeness to death was taken into account in examining food preferences of hospice care recipients.

The needs of family caregivers also have been of concern to hospice providers. Harrington, Lackey, and Gates (1996) studied the needs of caregivers of both hospice and clinic patients. Results indicated that the top information need of the caregivers of clinic patients was for honest and updated information and specifically information regarding treatment side effects. In contrast, the information needs of hospice caregivers concerned the symptoms to be expected. These needs represent the differences in the point in the illness trajectory of the two sets of patients. Spiritual needs were the second most frequently noted for both groups of caregivers. Personal needs included the need for adequate rest for both groups of family caregivers, but these were not considered to be as important by the family caregivers as the need for care of the patient. The authors recommend a longitudinal study on this subject.

Tang (2009) examined hospice caregiver quality of life (QOL) with an emphasis on those providing care at home. As Tang observes, the caregivers both provide support and need support placing those providers of care in a somewhat unique position in health care but an acknowledged aspect of hospice care. The focus by hospice programs on the family care provider is essential to the effective provision of hospice care and particularly home care and thus is an important area of investigation.

The congruence between patient and caregiver reports of symptom intensity was examined by McMillan and Moody (2003). The symptom intensity of pain, dyspnea, and constipation was evaluated by both patients and their family caregivers. Symptom intensity of all three symptoms were significantly overestimated by caregivers ($p = .000$). This overestimation is the basis upon which hospice nurses base their clinical decisions. The authors note that this study has implications for the education of hospice family caregivers.

Perceptions of the intensity of symptoms by nurses might be expected to be closer to those of their patients than was true for family caregivers. In a study by Rhodes, McDaniel, and Matthews (1998), 53 hospice patients, with a mean age of 69 years, were queried about their symptom experience with the Adapted Symptom Distress Scale Form 2. The nurses were also questioned about their patients' symptom experience. Like the informal caregivers, the nurses in this study overestimated the symptom intensity of their patients. The authors note that this is congruent with some other findings of overestimation but conflicted with findings of underestimation, particularly with regard to perceptions of pain. Indeed, McMillan (1996) demonstrated that pain was still not well managed in cancer patients. The importance of the instrument as a reliable means of assessing symptoms resulted in the incorporation of the Adapted Symptom Distress Scale Form 2 into the clinical practice of the nurses.

QOL is an important concept in health care. Hill (2002) examined both the measurement of QOL and how it might be improved in hospice patients. This study, like that by Rhodes et al. (1998) underscored the importance of nurses understanding how the patient assessed aspects of QOL. Hill indicated that this knowledge was a guide to the reflective practice of the nurse and assured clinically significant improvements of care for the patient.

In an exploration of the context for care, Rasmussen and Sandman (1998) investigated how patients in an oncology unit and in hospice spend their time. It was found that family members and nurses spend more time with patients in hospice than in oncology units but the time nurses spend is concerned with "tasks." If hospice nurses increased their time with patients because of the increased need for tasks, then the context has had little effect on the type of caregiving. The authors note the importance of time spent "being with" patients, not only in "doing for" patients.

The time devoted solely to tasks raises the question of whether death anxiety is a significant factor in hospice nurses. Payne, Dean, and Kalus (1998) examined death anxiety in hospice and emergency nurses and found that the latter had higher death anxiety and less support from their peers and supervisors. In another study, support was also deemed to be significant for hospice nurses if they were not engaging in blocking behaviors when confronted with the emotions of patients (Booth, Maguire, Behir, Butterworth, & Hillier, 1996). Death anxiety can be reduced for student nurses through educational experiences, as Mallory (2003) demonstrated.

Research demonstrating the interest and need for advanced education for hospice nurses had the additional benefit of providing information to nurses interested in hospice as a career (Wright, 2001). Although education and professional development have always been considered important for hospice nurses as for all nurses, Metcalfe, Pumphrey, and Clifford (2010) argue that hospice nurses need education on genetics so as to be able to address the implications of various genetic disorders. In particular, the authors stress the need for such education if nurses are to be aware of the psychosocial implications for families and patients afflicted with such diseases. Their research entailed responding to a questionnaire, and although the response rate was low (29%), the sample size of 328 provided a useful sample size for exploring issues of the importance and confidence to address various genetic disorders. The development of knowledge in genetics poses new opportunities in the provision of hospice care.

The bottom-line question for patients and families is whether hospice has a positive impact on QOL. Using the Hospice Care Performance Inventory, Yeung, French, and Leung (1999) identified six issues in which patient expectations and effectiveness of care were not congruent. Maximization of self-care and mobility were the two issues with the greatest discrepancy. Patients preferred to do their own self-care rather than have it done to them. Another patient priority included dispelling fear of death which, given that this was investigated with a Chinese population where it is considered a forbidden topic of conversation, is a challenge. Other patient priorities identified included gaining enough sleep, willingness to listen and give reassurances, and providing a satisfying diet. Interestingly, pain relief was not a high priority for patients. Not only does an approach such as this measure the discrepancy between patient expectations and effectiveness of care, it also has the potential to evaluate the impact of hospice care for patients.

A concern that enrollment in hospice can be equated to giving up was not substantiated in a study by Keyser, Reed, Lowery, and Sundborg (2010). They conducted a retrospective review of medical records from 2002 to 2008 and concluded that there was no detrimental effect of hospice on survival of patients with gynecological malignancies who accepted and those who declined hospice following a recommendation by their provider. Indeed, those with recurrent disease who followed the recommendation for hospice care had a longer survival (17 vs. 9 months).

Another example of research that examined the impact of hospice care was that by Kabel and Roberts (2003), who examined how the philosophy of hospice providers influences their perceptions of patient personhood. Specifically, this qualitative study examined how hospice staff at two hospice facilities in northwest England approached "normalizing" the symptoms of terminal illness. "Special" patients were found to be related to support of personhood of all patients, although the "special patients" were perceived to receive no preferential treatment. In fact, "special" patients were found to have a positive impact on the caregivers.

As noted, much hospice research has examined the impact of hospice on costs, an early concern of government officials when the development of a hospice benefit was being considered. The coming of age of hospice is indicated by the focus on enhancing hospice access and focusing on the quality of remaining life of hospice patients and their informal caregivers as well as the quality of the care received. Research is crucial to assuring that hospice care is all that it purports to be.

Inge B. Corless

HYPERTENSION

Hypertension (HTN), also known as high blood pressure (BP), is the most common risk factor for cardiovascular disease. Approximately 74.5 million or one third of U.S. adults have HTN and another quarter have pre-HTN, placing them at risk of developing HTN (Lloyd-Jones et al., 2010). Despite improvements since the 1980s in awareness, treatment, and control of HTN in the United States, a new diagnosis of HTN shortens an individual's life expectancy an average of 5 years because of potential target organ damage throughout the cardiovascular system, including the heart, the brain, the kidneys, and the eyes (Franco, Peeters, Bonneux, & de, 2005). HTN is anticipated to cost the United States a total of $76.6 billion in 2010 (Lloyd-Jones et al., 2010). Globally, 26% of individuals are estimated to have HTN, and rates are rising in many developing countries, resulting in a burgeoning global health problem (Kearney et al., 2005).

Current guidelines from the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7) define HTN as two or more BP readings of systolic BP ≥140 mmHg or diastolic BP ≥90 mmHg (Chobanian et al., 2003). Pre-HTN, defined as systolic BP ≥120 mmHg or diastolic BP ≥80 mmHg, increases the risk (up to twice the risk) of developing HTN (Chobanian et al., 2003). HTN is classified as either primary HTN (formerly called essential HTN) or secondary HTN. The cause of primary HTN, which accounts for 95% of cases, remains in question, but it is known to be correlated with obesity, increasing age, diabetes, alcohol consumption, and salt intake (Carretero & Oparil, 2000). Secondary HTN accounts for the rest of the cases and results from identifiable disorders, such as chronic renal disease, renovascular disease, primary aldosteronism, or sleep apnea, and may resolve with appropriate treatment of the underlying condition (Chobanian et al., 2003).

HTN is a major risk factor for cardiovascular disease, independent of other risk factors, although it is related to other metabolic risk factors. Metabolic syndrome, which is increasing in prevalence, comprises a constellation of risk factors, including HTN, abdominal obesity, dyslipidemia and insulin resistance (Chobanian et al., 2003). Although causal origins are not well understood, metabolic syndrome itself is a risk factor for the development of HTN, and the presence of HTN alongside metabolic syndrome poses increased cardiovascular risk. Similar underlying modifiable lifestyle risk factors have been identified for both the metabolic syndrome and HTN. Physical inactivity, diets high in fats and refined carbohydrates, and obesity are each associated with both HTN and the metabolic syndrome. Lifestyle modifications of these risk factors and smoking cessation is a central to management of both disorders (Grundy et al., 2005).

Because HTN cannot be cured in the vast majority of cases, actions to increase awareness, treatment and control of HTN are critical to avert target organ damage. In the United States, improvements since 1988 in awareness (81% vs. 69%), treatment (73% vs. 54%), and control (50% vs. 27%) of HTN have helped to recently attain the *Healthy People 2010* goal of 50% control of HTN (Egan, Zhao, & Axon, 2010). Despite the improvements in HTN control over the last decade, dramatic disparities in the prevalence and control of HTN exist in certain subpopulations (Institute of Medicine, 2003). For example, Blacks have higher rates of HTN, (40% vs. 27 and 25% in Whites and Hispanics, respectively; Glover, Greenlund, Ayala, & Croft, 2005), higher average BP, and more frequent target organ damage than other racial groups (Lloyd-Jones et al., 2010). Mexican Americans have disproportionately poor rates of HTN control when compared with other groups (17% vs. 30% in both Blacks and Whites) despite comparable prevalence (Glover et al., 2005). Socioeconomic status is consistently inversely related to HTN prevalence, regardless of race or ethnicity (Kaplan & Keil, 1993; Mensah, Mokdad, Ford, Greenlund, & Croft, 2005). Finally, geographic disparities in HTN control may contribute to higher rates of stroke in the Southeastern United States than in other regions (Howard et al., 2006). These disparities are most likely the product of complex social, financial, and political processes that result in barriers to effective health care and barriers to adoption of low-risk lifestyles (Cooper et al., 2000; Institute of Medicine, 2003). Unfortunately, despite recent attention to health disparities, disparities in HTN in the United States have either persisted or worsened in the past three decades, continuing to place an undue burden of cardiovascular risk on certain subgroups of the population (Cooper et al., 2000; Mensah et al., 2005).

The current approach to HTN treatment relies on adherence to treatment algorithms, such as the recommendations of JNC 7, within an organized health care system that provides regular assessments and reviews of care (Glynn, Murphy, Smith, Schroeder, & Fahey, 2010). The JNC

Table 3
STRATEGIES TO PROMOTE HTN CONTROL

Actions
Actions by Patients
Engage in essential prevention and treatment behaviors
Decide to control risk factors
Negotiate goals with provider
Develop skills for adopting and maintaining recommended behaviors
Monitor progress toward goals with home blood pressure monitoring
Resolve problems that block achievement of goals
Patients must communicate with providers about prevention and treatment services
Actions by Providers
Providers must foster effective communication with patients
• Provide clear, direct messages about importance of a behavior or therapy
• Include patients in decisions about prevention and treatment goals and related strategies
• Incorporate behavioral strategies into counselling
Providers must document and respond to patient's progress toward goals
• Create an evidence-based practice
• Assess patient's compliance at each visit
• Develop a reminder system to ensure identification and follow-up of patient status
Provide evidence-based treatment to goal, using JNC 7 guidelines
Actions by Health Care Organizations
Develop an environment that supports prevention and treatment interventions
Provide tracking and reporting systems
Provide education and training for providers
Provide adequate reimbursement for allocation of time for all health care professionals
Adopt systems to incorporate innovations rapidly and efficiently into medical practice
Adopt policies and practices that address disparities in HTN

Adapted with permission from Dennison, C. R., Houston Miller, N., & Cunningham, S. (2010). Hypertension. In S.Woods, E. Froelicher, S. U. Motzer, & E. Bridges (Eds.), *Cardiac nursing,* (6th ed.). Philadelphia, PA: Wolters Kluwer Health/Lippincott Williams & Wilkins. Originally taken from Miller, N. H., Hill, M. N. Kotke, T., et al (1997). The multilevel compliance challenge: Recommendations for a call to action. *Circulation, 95*, 1085–1090.

7 treatment algorithm for HTN highlights the importance of lifestyle modification in addressing HTN, followed by pharmacological treatment to goal based on established guidelines (Chobanian et al., 2003). Lifestyle modification that has been shown to lower BP includes weight loss, increased physical activity, and dietary modification such as sodium and alcohol reduction and adoption of the DASH diet (a diet low in fat and rich in fruits, vegetables, and whole grains with low-fat dairy products; Chobanian et al., 2003).

Lifestyle and pharmacological management strategies require actions by patients, health care providers, and health care organizations within a multilevel framework of action, as outlined in Table 3. A team-based approach to HTN management has been an effective strategy in many settings and may improve both consistent delivery of preventive services and adherence to treatment algorithms (Carter, Rogers, Daly, Zheng, & James, 2009; Norby, Stroebel, & Canzanello, 2003; Walsh et al., 2006). Teams should include the patient as a central figure and may also include the nurse, health educator, community health worker, nutritionist, pharmacist, and physician. Optimal management of HTN requires collaboration between patients and providers, collaboration among team members, and effective intervention within the health care organization (Coordinating Committee of the National High Blood Pressure Education Program, 1984; Miller, Hill, Kottke, & Ockene, 1997).

Nurses have a key role in all aspects of a collaborative approach to HTN management, from screening to identify undetected HTN, to conducting research, to setting national policy. The role of the individual nurse depends on his or her preparation, work experience, and practice setting. Physician–nurse teams have been an effective method of delivering HTN treatment plans in many settings (Canzanello, Jensen, Schwartz, Worra, & Klein, 2005; Dennison, Peer, Steyn, Levitt, & Hill, 2007; Dennison, Post, et al., 2007; Litaker et al., 2003). Within these settings, nurses provide any number of interventions, many of which have been investigated by nurse researchers. In particular, nurses have a long history of delivering proven health education and health counseling interventions (Hill, 1989; Jones, 2008) and providing interventions aimed at treatment adherence (Hill, Miller, & De Geest; Kirscht, Kirscht, & Rosenstock, 1981; Logan, Milne, Achber, Campbell, & Haynes, 1979), which is a key predictor of HTN control (Chobanian et al., 2003). More recently, nurse practitioners are increasingly taking the lead on managing HTN in primary care settings, and a growing body of evidence indicates they are effective in this role (Glynn et al., 2010; Laurant et al., 2005). Nurses will continue to play a key role in future research, dissemination, and implementation of effective interventions for HTN prevention and treatment.

Future work will need to improve translation and dissemination of effective strategies into practice. This need is heightened all the more by the increasing burden of HTN now in developing countries and the anticipated increase in HTN in developed countries with the rising obesity epidemic (Dennison et al., 2007). Because of this growing epidemic of obesity and metabolic syndrome, nurses, other clinicians, and researchers should also anticipate increasing rates of HTN at younger ages. Greater focus on prevention, including attention to social and behavioral determinants of HTN, will improve our ability to respond to the growing global burden of HTN. Finally, tailoring interventions according to culture, language, social environment, and behavioral constructs has the potential to improve the effectiveness of interventions and may help address health disparities in HTN.

In conclusion, HTN is a common and major risk factor for cardiovascular disease. The prevalence is increasingly globally and is anticipated to rise in developed countries as rates of obesity and metabolic syndrome rise. Effective treatment of HTN includes lifestyle modification and pharmacological treatment. Although evidence-based algorithms for HTN prevention, detection, and treatment have been widely promulgated and HTN control rates have improved, the rates remain suboptimal in subpopulations, including Blacks, Hispanics, and those of low socioeconomic position. Achieving further improvements in HTN control will require activated patients, providers, and health care organizations. Nurses play a key collaborative role in both research and practice.

Cheryl R. Dennison Himmelfarb
Laura J. Samuel
Martha N. Hill

IMMIGRANT WOMEN

Migration entails the movement of individuals and groups from one region or country to another with the intent of temporary or permanent settlement. Internal migration within national borders often flows from rural to urban areas. Transnational migration is a global phenomenon with both causes and consequences in social, cultural, political, and health arenas (Messias, 2007). Women tend to leave their homes because of economic, political, environment, and social difficulties and instability and often seek family reunification, improved educational and economic opportunities, with hopes and plans for a more stable and productive life for themselves and their families. However, the migratory passage and settlement experiences often expose women to health risks, increased social, physical, and emotional vulnerabilities, and social marginalization. In terms of health care access, immigrant women frequently encounter multiple barriers to appropriate and affordable services, resources, and support.

In nursing, a transitions perspective is particularly appropriate for research on immigrant women's health (Meleis, Sawyer, Im, Messias, & Schumacher, 2000; Messias, 2010). For women—and those who migrate with them or whom they leave behind—migration is a complex social, cultural, economic, and environmental transition that may involve significant changes, disruptions, and differences in a wide range of human interactions and social networks (Jones, Zhang, & Meleis, 2003; McGuire & Martin, 2007). For most immigrant women, migration and settlement—and in some cases, return migration—occur within fluid, in-between spaces of transition and ongoing social, cultural, economic, and identity adaptations and adjustments (Donnelly, 2006). The migration transition involves preparation, the migratory act, complex processes of settling in and adapting to the new environment, and ensuing identity transformations. In planned migration, the transition begins with anticipation and preparation. Some women may engage in premigration health practices (e.g., engaging in preventive examinations or checkups, acquiring stocks of prescription medications) either as part of formal migration procedures, to validate their personal health status, or as a strategy to avoid untoward future medical and dental expenses in the host country (Hilfinger Messias, 2002). Migration tends to be an ongoing transition that has no set time span or universally applicable critical points or events (Messias, 2010). It is a transition that may be "reactivated" over time in conjunction with other situational, developmental, and health–illness transitions (e.g., job loss, pregnancy, personal or family illness, and death of a family member).

Researchers also use other conceptual frameworks and theories to describe and explain the health experiences and responses of immigrants. These include selective migration, opposing positions of the positive or negative effect of migration on health, and the interactions of immigrant acculturation and health (Im & Yang, 2006; Messias & Rubio, 2004). Selective migration (also referred to as the healthy migrant effect) posits that migrants tend to be healthy and resilient in the face of the potential health hazards of migration. The healthy migrant effect explains, at least partially, the better health status of recent immigrants compared with native-born groups. The notion of the positive effect of migration on health is based on the premise that many migrants encounter better living conditions, upward social mobility, improved economic status, and a safer and healthier environment in the host country (Evans, 1987). Others have posited a negative effect of migration on health, the result of inherently difficult, stressful, and even hazardous conditions of immigrant life and exposure to communicable diseases, physical and emotional stress, and limited access to care (Trimble, 2003). Much of the nursing research related to immigrant health has focused on the notion of acculturation. However, there is considerable variation in the definition and operationalization of acculturation as a research variable (Messias & Rubio, 2004). Critiques of existing theoretical models of immigration and health include ethnocentric bias, inadequate empirical support, and lack of applicability to diverse, heterogeneous immigrant populations (Hunt, Schneider, & Comer, 2004).

Nursing research with specific immigrant groups, such as Lipson's (1993) study of Afghan refugees, and McGuire's (2001) transnational investigation of indigenous immigrants from Oaxaca, Mexico, have contributed to furthering the understanding of migration-related trauma, loss, and post-migration health care needs. Distance and separation from family and community is a difficult aspect of transnational migration. McGuire and Martin (2007) examined the effect of global neoliberal economic models on families and communities in rural Mexico and the resulting accelerated migration of indigenous women to the United States. The fracturing of families resulted in physical and emotional suffering and sadness among women separated from their children, for whom they were making enormous personal sacrifices. For women from sociocentric cultures (e.g., Central and South America) who migrate to the United States, the social and environmental transition to an egocentric culture may affect women's health and health-promoting activities (Bathum & Baumann, 2007). Yet living in proximity with other immigrants does not necessarily create a sense of community. Community-based research with recent Latina immigrants in a new settlement area of the Southeastern United States indicated that the de facto concentrations of Latino immigrants in apartment complexes or trailer parks are not necessarily accompanied by a sense of belonging and community (Barrington & Messias 2010).

Immigrant women share unique characteristics that require special gender-sensitive research and clinical efforts. They share the vulnerabilities and the marginalization of minority women in general, and face additional challenges related to cultural differences, language barriers, transportation, and role overload. Immigrant women often find host country gender roles and expectations are at odds with those of their home country (Remennick, 2004; Rodriguez, 2007). Another challenge is maintaining home country heritage while adopting the values and beliefs necessary to integrate themselves and their families into the host culture (Aroian et al., 2009). Although most studies of immigrant women focus on groups characterized by evident gender inequality, there is some evidence that even women from groups with less gender inequality experience more psychological distress and have different sources of distress than their male counterparts (Aroian, Norris, & Chiang, 2003; Aroian, Norris, Gonzalez de Chavez Fernandez, & Averasturi, 2008). These variables influence immigrant women's health and health care, and many of the variables have not been adequately studied.

A nursing perspective focusing on immigrant women and their health includes research on gender and health, culturally influenced explanatory models of illness, transitions and health, and marginalization and health (Aroian, 2001; Meleis, 1995; Meleis, Lipson, Muecke, & Smith, 1998). Immigrant women's multiple gender roles influence their ability to access and receive quality care. They are expected not only to cook, do housework, care for children, and often to contribute income but also to act as family mediators and culture brokers. In addition to their family responsibilities, immigrant women often are expected to take responsibility for accessing and navigating host-country institutions and bureaucracies (e.g., schools, social services, health care systems). The ways in which immigrant women express their symptoms and the meanings they attach to health care encounters also contribute to their health outcomes. The opportunity for immigrant women to describe and explore their explanatory models of illness with health care providers may contribute to improved provider–patient relations and, ultimately, to improved health outcomes (Reizian & Meleis, 1987). Research with South Asian women in Canada indicated the ways in which essentialism, culturalism, and racialization are manifested in health care interactions (Johnson et al., 2004). There is a clear need for ongoing educational and policy interventions to address such *othering* practices to support equitable health care for immigrants.

Immigrant women tend to work and be employed in environments that contribute to increased health risks. These include working at home or in family businesses that provide limited protections or benefits. When employed outside the home, immigrant women often work in low-income jobs such as work in poultry plants, garment shops, or domestic work where they engage in repetitive and awkward movements, are exposed to risk of injury, and often have little or no recourse to occupational health resources (Burgel, Lashuay, Israel, & Harrison, 2004). Women who accompany male family members may be concerned about their personal immigration status and, therefore, because of their insecurity and perceived vulnerability, may be less likely to disclose or report battering, harassment, or abuse.

Several strategies have been developed to provide care for immigrant women. The most effective models are groups that focus on women's strengths, employ the use of cultural brokers, and are implemented using feminist participatory models. Research focused on limited English–proficient immigrants has highlighted the importance of qualified language interpretation and translation services and the need for cultural brokering, orientation, and support programs to facilitate the immigrants' access to and navigation of the complex U.S. health care systems (McDowell, Messias, & Estrada, 2011).

Future areas for scholarship include methods for defining populations, developing culturally competent research tools, using appropriate theoretical frameworks, and uncovering the critical markers in the transition process that render immigrants more vulnerable. Immigrant women face increasingly complex social and health problems. The impact of public policy changes in the social welfare area and the institution of health care reform could directly affect immigrant women and their families. What is needed is a comprehensive immigration reform focused on women. Immigrant women must be part of the dialogues about such reforms. Their voices and presence in policy dialogues must be sought, valued, and included (Glasford & Huang, 2008). In the United States, the increasing diversity of the population and concurrent resurgence of nativism and backlash against immigrants is a concern for nurses and health care providers. Engaging immigrant communities in health initiatives, increasing the cultural and linguistic competence of nursing and health care personnel and systems, and developing and testing culturally and linguistically appropriate models of care are top priorities with the increasing diversity of populations.

Afaf Ibrahim Meleis
DeAnne K. Hilfinger Messias
Karen J. Aroian

INFECTION CONTROL

Infection control addresses the spread of infections within health care settings (from patient to patient, patients to staff, staff to patients, or among staff), including prevention (via hand hygiene/hand washing, cleaning/disinfection/sterilization, vaccination, and surveillance), monitoring/investigation of demonstrated or suspected spread of infection within a particular health care setting, and management (interruption of outbreaks). Acquisition of health care–associated infections (HCAIs) are perceived as a significant challenge in terms of the risk to patient safety as well as the economic burden placed on health services. Additionally, there is intense media and public interest on infection control, to the extent that prevention and control of HCAIs is now a key focus of global health care policy.

Controling infection is a problem because hospitals were established to provide care for the sick. Pioneering individuals, such as Semmelweiss, Nightingale, Lister, and Koch, demonstrated that a direct relationship existed between the rate people acquired infection while in the hospital and infection control practices within hospitals. Advances in medical technology and treatment means that more patients are now being treated in hospitals and many are increasingly vulnerable to infections because of the greater severity of underlying illness, the use of invasive devices, and increased levels of immunosuppression. Pathogen resistance to antimicrobial agents and hospital organizational factors, such as high bed occupancy and understaffing, have compounded the problem. The risk of acquiring an infection is dependant on the relationship between microorganisms, patients, health care workers, and the environment. It is not possible to prevent all HCAIs, but high standards of infection control can mimimize the risk of their occurrence.

Nowadays, 5% to 10% of patients admitted to the hospital acquire a HCAI (Smyth et al., 2008; World Health Organization, 2005). HCAIs are a major challenge to the health services and to society in general because of the burden (economic, socioeconomic, morbidity, and mortality) placed on individuals, their families, and on the health services (Cosgrove, 2006; Kilgore et al., 2008).

There is a wealth of evidence that underpins the critical role that health care workers' hands play in transmitting potentially pathogenic microorganisms within the health care environment and, in due course, to patients (World Health Organization, 2005). Optimal hand hygiene is considered the cornerstone of preventing HCAIs (Pittet et al., 2006). Internationally, health care workers' hand hygiene practices are guided by evidence-based guidelines published by the World Health Organization or the Centers for Disease Control (CDC; Boyce & Pittet, 2002; World Health Organization., 2005). In Ireland, health care workers' hand hygiene practices follow guidelines published as part of the Strategy for control of Antimicrobial Resistance in Ireland (2005). The Strategy for control of Antimicrobial Resistance in Ireland guidelines closely resemble the CDC guidelines. However, compliance is poor, internationally (Akyol, 2007; Dedrick et al., 2007; Rosenthal, Guzman, & Safdar, 2005) and nationally (Creedon, 2005; Creedon et al., 2008), despite an enormous amount being written on health care worker's hand hygiene practices (Gould, Chudleigh, Drey, & Moralejo, 2007; Pittet et al., 2006).

The quality of care that patients' receive while being cared for in hospitals is the focus of increased attention. In particular, control of infection is perceived as a fundamental aspect of quality health care and is a cause for concern for patients who access the health services. Findings from a recent European Commission survey (*n* = 26,663 individuals) revealed that 71% of Irish respondents (*n* = 976) felt that they are likely to contract a hospital infection if admitted to an Irish hospital.

This represented the fifth highest rate of concern expressed by participants across the 27 member states. Greeks scored the risk of acquiring a HCAI highest at 81% and Austria lowest at 18% (European Commission, 2010)

The provision of quality patient care is not simply about exhorting individuals within hospital settings to change their own practices; the environment in which health care workers' work in must be considered as well (Buetow & Roland, 1999; West, 2001). The importance of considering the environment that health care workers' practice in was emphasized in a seminal report by the Institute of Medicine in the United States in 2004. Serious concerns were raised about health care workers' work environments, particularly nurses, and their impact on patient outcomes. The authors noted that typical nursing work environments are characterized by many serious threats to patient safety (Page, 2004) and suggested that these threats may be caused by organizational management practices, work design issues, and organizational culture.

The report *First Do No Harm* concluded that it is not acceptable for patients to be harmed by the health care system that is supposed to offer healing and comfort. One of the report's main conclusions is that the majority of adverse patient outcomes result from faulty systems, processes, and conditions that lead people to make mistakes or engage in suboptimal practices, that is, it is not a "bad apple" problem. The impact of health care workers' work environment on health care workers hand hygiene behavior is a poorly studied area.

Hand hygiene research varies enormously in terms of methods and interventions. Some studies focus on a particular occupational group only (Gould & Chamberlain, 1997; Rosenthal, McCormick, Guzman, Villamayor, & Orellano, 2003; Van de Mortel & Heyman, 1995), whereas others include all health care workers' involved in patient care (Creedon, 2005; Swoboda, Earsing, Strauss, Lane, & Lipsett, 2007; Trick et al., 2007). Some studies only consider two opportunities for hand hygiene, that is, before and after patient contact (Rosenthal et al., 2005; Swoboda et al., 2007), whereas others base their indications for hand hygiene on published sets of hand hygiene guidelines, for example, the CDC incorporating nine different opportunities (Larson, Quiros, Giblin, & Lin, 2007) or five sequential steps (Pittet et al., 2006). Methods of quantifying hand hygiene compliance differ, for example, self-reported, direct observation, or proxy measurement, that is, the use of hand hygiene agent (Boyce, 2008).

Seminal publications on the most promising ways to address health care workers' noncompliance with hand hygiene guidelines focus on the importance of addressing personal variables that may influence behavior (Gould, Moralejo, & Drey, 2007; Naikoba & Hayward, 2001; Pittet, 2004). A variety of perspectives have been used to examine hand hygiene behavior and how it can be promoted. The World Health Organization (2009, pp. 87–88) emphasizes the role of education, motivation, cues to action, patient empowerment, and the need for structural and philosophical change to health care systems. Some authors highlight the possible effect of hospital organizational features on health care workers' hand hygiene behavior and resultant acquisition of HCAIs (Larson, Cloonan, Sugrue, & Parides, M, 2000; Pittet, 2000; Whitby, Slater, Tong, & Johnson, 2008). Others focus on the role of social cognitive models, such as the health belief model, health locus of control, protection motivation theory, theory of planned behavior, and the self-efficacy model (World Health Organization, 2009). Additionally, theoretical perspectives such as PRECEDE (Creedon, 2005) and the importance of role modeling (Lankford et al., 2003) deserve mentioning.

None of the theoretical approaches have yet made a cogent contribution to providing an answer to understanding why health care hand hygiene behavior is clearly a problem and it is telling that the World Health

Organization (2009) concludes that "the inability over two decades to motivate health care workers compliance with hand cleansing suggests that modifying hand hygiene behavior is a complex task."

Despite the lack of empirical evidence, it is reasonable to suggest that a relationship may exist between health care workers perceptions, their work environment, hand hygiene behavior, and infection rates. To date, variations in infection rates and health care workers' hand hygiene practices in similar type hospitals are unexplained. Furthermore, health care workers hand hygiene practices remain persistently low despite national campaigns such as the *Say No to Infections* campaign in Ireland and the *Clean Your Hands Campaign* in the United Kingdom. A possible explanation may be that these campaigns were directed entirely at the individual health care worker without making any attempt to focus on addressing hospital organizational factors that impact on health care workers work environment.

The possible impact that hospital organizational features may have on health care workers' hand hygiene behavior and resultant acquisition of HCAIs has merited some discussion (Larson et al., 2000; Pittet, 2000; Whitby et al., 2008). From a theoretical perspective, organizational behavioral theory focuses on the association between participation in an organization and achieving organizational goals (Kanter, 1977). Achieving organizational goals within a hospital setting may easily be related to a reduction of HCAIs. Kanter's (1977) theory of organizational behavior concludes that the behavior exhibited by an individual working in an organization is shaped by their perceptions of support within the work environment. It is plausible to suggest that health care workers' perceptions of support within the work environment influences their compliance with guidelines such as hand hygiene guidelines. There is evidence that interventions overtly supported by hospital organizational features (e.g., hospital management) lead to health care workers positively identifying with, and actively participating in the intervention, but many lack empirical data to support the conclusions made (Lankford et al., 2003; Larson et al., 2000; Pittet, 2000; Whitby et al., 2008).

Nursing research extending Kanter's (1977) theory found that a supportive work environment is directly related to work effectiveness, job satisfaction, and organizational commitment (Laschinger & Havens, 1997; Laschinger, Almost, & Tuer-Hodes, 2003). A supportive work environment is also inversely associated with patient outcomes, such as mortality (Aiken, Clarke, Sloane, Lake, & Cheney, 2008; Aiken & Lake, 1994; Rafferty et al., 2007), patient falls, medication errors (Laschinger & Leiter, 2006), patient satisfaction (Donahue, Piazza, Griffin, Dykes, & Fitzpatrick, 2008), length of stay (Needleman, Buerhaus, Mattke, Stewart, & Zelevinsky, 2002), and improved hemodialysis performance (Harwood et al., 2007).

Given the continuing level of interest that exists in improving health care workers' hand hygiene practices and the lack of any study, with the exception of Larson et al. (2000), explicitly and empirically investigating the association between hand hygiene and hospital organizational characteristics, it may be timely to further explore the effect that hospital organizational characteristics and health care workers' perceptions of a supportive work environment have on health care workers' hand hygiene behavior and ultimately rates of HCAIs.

Sile A. Creedon

INSTITUTIONAL REVIEW BOARD AND INFORMED CONSENT

In 1974, the Department of Health and Human Services required that all research involving human subjects should have an institutional review. The Institutional Review Board (IRB) procedures are part of the regulations for the Protection of Human Subjects of Biomedical Research (Title 45, Code of Federal Regulations [CFR] 46, Subpart A). This code was revised and expanded in 1978, 1983, 1991, 2001, and 2009. In 1991, these guidelines were adopted, as a common core of regulations governing human subjects' research, by all federal agencies and departments. These core regulations (45, CFR 46) became known as the common rule, because the regulations were common to federal entities conducting research on human subjects.

Each IRB should have a minimum of five members with varying backgrounds and diversity to ensure adequate review of the research usually conducted at the institution (45, CFR 46.107). Members must be qualified with pertinent experience and expertise to ensure the protection of research subjects. The diversity of the members, including race, gender, and ethnicity, is another consideration in the makeup of the IRB. IRBs that are regularly reviewing research protocols involving vulnerable populations, such as children, prisoners, and pregnant women, should consider having IRB members experienced with these vulnerable subjects involved in the review. IRBs must have male and female members coming from more than one profession. One member of the IRB must be from the scientific area, one from a nonscientific area, and at least one not affiliated with the institution. When additional expertise is required for a particular review, the IRB may invite additional individuals to participate in the review. These individuals are nonvoting.

There are three levels of IRB review: (1) exempt from review, (2) expedited review, and (3) complete review. The IRB chairperson or IRB decide on the type of review warranted for individual studies.

(1) Exempt from review (45, CFR 46.101b). When human subjects are involved in specific categories of research exposing the research subjects to no apparent risks, then the research activities are exempt from IRB review. In Table 4, a list of research activities exempt from review is displayed.

(2) Expedited review (45, CFR 46.110). This type of review is undertaken when the reviewers ascertain that the research will have only a minimal risk to research subjects. Under 46.303 of the code, *minimal risk* is defined as "the probability and magnitude of physical or psychological harm that is normally encountered in the daily lives, or in the routine medical, dental, or psychological examination of healthy persons" (45, CFR 46.303).

Also, expedited review may be conducted when there are minor changes in previously approved research protocols. Expedited reviews may be conducted by the IRB chairperson or by one or two experienced reviewers designated by the chairperson from the IRB members. These reviewers may exercise all of the authorities of the IRB, except that the reviewers may not disapprove the research. A complete review of the research protocol is necessary prior to disapproval of the research.

(3) Complete review (45, CFR 108; 45, CFR 46.109). All studies with greater than minimal risks must have a complete review by the IRB. The IRB must ensure that specific requirements are met to approve the research. These requirements include ensuring that the risks to research subjects are minimized and are reasonable in relation to the anticipated benefits. Informed consent must be obtained and documented. A data-monitoring plan to ensure research subject's safety and adequate protections to ensure the privacy and confidentiality of subjects and data are in place. Complete review is conducted at IRB meetings with the majority of the IRB members present, including at least one whose primary concern is nonscientific. The majority of the IRB members must approve the research for it to be approved.

Table 4
Research Activities Exempt From IRB Review (45, CFR 46.101b)

(1) Research conducted in established or commonly accepted educational settings, involving normal educational practices, such as (i) research on regular and special education instructional strategies, or (ii) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.

(2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, or achievement), survey procedures, interview procedures or observation of public behavior, unless: (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

(3) Research involving the use of educational tests (cognitive, diagnostic, aptitude, ad achievement), survey procedures, interview procedures, or observation of public behavior that is not exempt under paragraph (b2) of this section, if: (i) the human subjects are elected or appointed public officials or candidates for public office; or (ii) federal statute(s) require(s) without exception that the confidentiality of the personally identifiable information will be maintained throughout the research and thereafter.

(4) Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

(5) Research and demonstration projects which are conducted by or subject to the approval of department or agency heads, and which are designed to study, evaluate, or otherwise examine: (i) Public benefit or service programs, (ii) procedures for obtaining benefits or services under those programs, (iii) possible changes in or alternatives to those programs or procedures, or (iv) possible changes in methods or levels of payment for benefits or services under those programs.

(6) Taste and food quality evaluation and consumer acceptance studies, (i) if wholesome foods without additives are consumed or (ii) if a food is consumed that contains a food ingredient at or below the level and for a use found to be safe, or agricultural chemical or environmental contaminant at or below the level found to be safe, by the Food and Drug Administration or approved by the Environmental Protection Agency or the Food Safety and Inspection Service of the U.S. Department of Agriculture.

From U.S. Department of Health and Human Services (2009, January 15). *Protection of human subjects*. Code of Federal Regulations, Title 45, Part 46. Retrieved from http://www.hhs.gov/ohrp/humansubjects/guidance/45cfr46.htm#46.101

Under federal guidelines, the IRB can review and has the power to approve, disapprove, or require modifications for all research covered by Title 45, CFR 46.109 (IRB Review of Research). The IRB requires that the information given to research subjects as part of the informed consent is provided according to Title 45, CFR 46.116. Also, the IRB can require that additional information be given to research subjects if such information will add to the protection of the subjects. The IRB requires documentation of the informed consent. A waiver of written consent can be given if the consent form is the only record linking the subject and the research, and the principal risk would be potential harm resulting from a breach of confidentiality. Also, a waiver of written consent may be given if the research presents no more than minimal risk of harm to subjects and involves no procedures for which written consent is normally required outside of the research context.

The IRB gives investigators and the institution, in writing, its decision to approve, disapprove, or of modifications required prior to IRB approval of the research. When the IRB disapproves a research study other reasons for the decision are provided and the investigator is given an opportunity to respond to the decision.

The IRB has the authority to conduct continuing reviews of the research once it is approved. The frequency of these reviews is determined by the degree of risk to the subjects, but it should not be less than yearly. Also, the IRB has the power to observe or have a third party observe the consent process of any approved research study.

The consent form must contain a statement that the study is research along with the purposes of the research, the expected length of participation, and details of the procedure (elements of a consent form; 45, CFR 46.116). There is a description of the foreseeable risks and expected benefits, and details of alternate procedures are given if appropriate. Information related to confidentiality of the data, as well as details of compensation in the event of injuries, are provided. The consent form also contains information related to voluntary participation, and withdrawal from the study without penalty. Contact information for answers to any questions is also contained on the form.

The written consent form must be approved by the IRB. Prior to participation in the research study, the subject or the subject's legal representative will sign the consent form. The information on the consent form can be read to the subject or the subject's legal representative. Also, they must be given sufficient time to read the consent form before they sign it. A copy of the consent form is given to the signee (documentation of informed consent; 45, CFR 46.117).

Mary T. Quinn Griffin

INSTRUMENT TRANSLATION

With the growing cross-cultural and international collaboration in nursing research, and with the emphasis on identifying differences and similarities among people's ethnic- and culture-related health status outcomes, the need for culturally sensitive instruments has also increased. Yet, being able to systematically account for health-related perceptions and health behaviors is strongly associated with the majority of well-established measurements developed in English that are targeted for the Western culture, particularly for people in the United States. Consequently, many nurse scientists need expertise in instrument translation prior to conducting cross-cultural research.

Instrument translation is defined as a process of adapting an instrument developed in one language (source language; SL) into another language (target language; TL) with sensitivity to the culture being studied (Geisinger, 1994). The aim of translation is not merely to achieve literal or syntactic equivalence, but to maintain the original meanings (denotation and connotation) of the instrument items or questions (Tang & Dixon, 2002). Therefore, an instrument translation is not a simple word-for-word translation process. Rather, it is a multistep process involving rigorous and scientific procedures.

Many researchers (Jones, Lee, Philips, Zhang, & Jaceldo, 2001; McDermott & Palchanes, 1994; Tang & Dixon, 2002; Willgerodt, Kataoka-Yahiro, Kim, & Ceria, 2005; Yu, Lee, & Woo, 2004) recommended and used Brislin's (1970, 1980, 1986) translation method as the most reliable method for developing an equivalent translated instrument. This method includes the following five steps: (1) forward (one way) translation—translation of the original instrument, the SL version, into a TL version by a bilingual person; (2) review of the TL version by a monolingual reviewer of the TL for wordings that are ambiguous or difficult to understand; (3) backward translation (back-translation)—the reviewed TL version (step 2) is translated back into the source language (BT) version by another bilingual person, who is "blinded" to the SL version; (4) comparison of the original SL and BT versions, as well as the TL version, for linguistic congruence through identification and correction of discrepancies; and (5) a pretest of the TL versions on monolingual individuals and/or the SL and TL version on bilingual individuals, to ensure the linguistic equivalence and cultural relevancy of the translated instrument. When translation errors that lead to differences in meaning are identified, these steps need to be repeated so that a maximum equivalence between the SL and TL versions is achieved.

One of the major issues related to instrument translation is that there has been no consensus on standard guidelines for the processes and evaluation of its quality (Maneesriwongul & Dixon, 2004). Historically, nursing has shifted from qualitative methods to applying multiple methods of qualitative and quantitative approaches, including the use of instruments to understand and compare health phenomena among different cultures and groups of people (Meleis, 1996). However, with a lack of standard guidelines, the quality of instrument translation processes and how these processes are implemented varies widely among published cross-cultural nursing research (Maneesriwongul & Dixon, 2004; Willgerodt et al., 2005). To address this issue, Maneesriwongul and Dixon (2004) systematically examined published nursing literature and classified instrument translation processes into six hierarchical categories with an analysis of strengths and weaknesses of the approaches: (1) forward-only translation (without pretest), (2) forward translation with monolingual test, (3) back-translation only (without pretest), (4) back-translation with monolingual test, (5) back-translation with bilingual test, and (6) back-translation with both monolingual and bilingual tests.

Unfortunately, nurse researchers encounter socioeconomic and contemporary practice issues that may render these rigorous, and possibly expensive, approaches to instrument translation as unfeasible. It may be challenging to locate more than one experienced bilingual translator and experts (reviewers) who are knowledgeable in the purpose and intent of the instrument, as well as familiar with the everyday use of the language in the target society (Wang, Lee, & Fetzer, 2006). On the contrary, as increasing number of nurses from non–English-speaking countries receive advanced educations in the United States or other English-speaking countries, the researchers themselves may serve as bilingual translators and personally develop a translated instrument. However, even if back-translation is employed, the person conducting the research is unlikely to be blinded to the original instrument, and therefore, may be biased toward the culture of the SL. As a result, the approach of having the researchers themselves serving as bilingual translators calls into question the translation quality and the validity of the study findings (Jones & Kay, 1992).

In addition, the recruitment of sufficient bilingual subjects for pretesting on the target population may not be easy (Jones, 1986; Tang & Dixon, 2002; Yu et al., 2004). Willgerodt et al. (2005) also points out that researchers often underestimate the time needed to translate instruments. Because the translation processes involves numerous discussions and iterations in each of multiple steps, it can be time-consuming and costly. Therefore, adequate time and budget must be built into a research plan. If sufficient numbers of translators, experts (reviewers), and/or bilingual subjects cannot be recruited, or time and/or budget is severely restricted, the rigor of the instrument translation process will be diminished (Maneesriwongul & Dixon, 2004).

Major issues from theoretical and research perspectives are related to the establishment of equivalence (validity) in a translated instrument. Literal translation compromises not only the language congruence, but also the content/conceptual validity of the translated instrument. For example, bilingual translators tended to follow the grammatical structure (word sequence) and/or nuances of the SL and the translation is likely to be literal (word-for-word translation), which can result in awkward syntax and incomprehensible sentences in the TL version (Hilton & Strutkowski, 2002; Maneesriwongul & Dixon, 2004; Willgerodt et al., 2005). As recommended by Brislin (1986), the TL version should be reviewed by one or more individuals who do not have any familiarity with the original version, so that such grammatical errors can be identified.

Also, some contents and words representing a particular construct (concept) are difficult to translate into another language when no comparable concept or word exists in the TL or when the use of a concept is slightly different between cultures (Hilton & Skrutkowski, 2002; Yu et al., 2004). In addition, a word in the SL may have several meanings in different contexts, thus rendering several possible translations in the TL. Consequently, the translators need to focus on the whole meaning (both denotation and connotation) of a sentence, rather than the literal translation, so that the translated sentence in the TL accurately reflects the original intent and specific concepts in the instrument (Capitulo, Cornelio, & Lenz, 2001; Willgerodt et al., 2005).

Without the established equivalence, the research findings are considered inconclusive because the difference may be due to translation errors rather than the true difference among groups or cultures (Goulet, Polomeno, Laizner, Marcil, & Lang, 2003; Jones et al., 2001). Yet, most published literature on cross-cultural research fails to provide detailed information on processes and criteria used to evaluate the equivalence of translated instruments with the original instruments (Tang & Dixon, 2002). Specifically, the following information is essential to determine the equivalence of the translated instrument (Maneesriwongul & Dixon, 2004; Wang, Lee, & Fetzer, 2006; Willgerodt et al., 2005): (1) the methods of translation (forward only or both forward and back-translation), (2) the qualification of translators and experts (reviewers), (3) the approach used to examine the equivalence (validity) of translation, (4) the process and the results on pretesting of the instrument with monolingual and/or bilingual subjects, (5) the information on psychometric properties, and (6) the criteria used. Without this information, it is difficult to fully understand how translation procedures were implemented or adapted to maintain the scientific rigor of instruments and studies while being culturally sensitive to the populations of interest.

In summary, instrument translation is a multistep process of adapting an instrument developed in one language (SL) into another language (TL) with sensitivity to the culture being studied. Without the established equivalence, cross-cultural comparisons using the translated instruments should not be made because differences found may be due to translation errors rather than the true difference among cultures. There is a need for nursing to build the consensus on standard guidelines for the processes and evaluation of instrument translation and equivalence. All studies involving instrument translation should provide detailed information in reports to demonstrate that the translation process and testing of equivalence were theoretically and methodologically valid and adequate.

Chiemi Kochinda

INSTRUMENTATION

Instrumentation is a broad term for the activities involved in developing, testing, and revising measures of concepts important to nursing. The term is typically applied to these processes that relate to psychosocial or self-report measures of attitudes and behaviors. However, instrumentation also refers to the validating of measures for physiological parameters or laboratory devices. The goal of instrumentation is to produce quantitative values that reduce measurement error through consistency, accuracy, and sensitivity of the procedure, tool, or survey. For self-report instruments, consistency is analogous to reliability, and accuracy is analogous to validity. With laboratory instruments, validity is also used to describe the accuracy of the measures, but precision refers to the instrument's consistency in measurement. Sensitivity is directly applicable to both types of measurement and refers to the instrument's ability to finely discriminate in individual differences and changes in the concept under study. Reduction of measurement error is achieved by assuring that as much response variability as possible is due to the subject's relationship to the concept under study rather than to inconsistent or systematic extraneous factors.

The term *psychometrics* refers to the testing of self-report measures and to the statistics that are utilized in that examination. Self-report measures generally fall into the categories of norm-referenced and criterion-referenced. With norm-referenced instruments, the goal is to obtain a spread of scores across a wide range for the purpose of discriminating between subjects. Criterion-referenced measures are constructed for the purpose of determining whether a subject has or has not achieved a predetermined set of target behaviors. Steps in instrumentation for these two categories differ: however, the majority of attitudinal and behavioral measures applicable to nursing are norm-referenced, and their construction and testing is emphasized.

Instrumentation for self-report measures involves three general phases: development, testing, and revision. Instrument development involves concept clarification, developing a theoretical definition, operationalizing the concept, and generating items. Concept clarification commonly is done through concept analysis, synthesis, or derivation. Concept analysis involves a careful review of literature with attention to consistencies and inconsistencies in the use of the concept. Concept synthesis uses clinical observations to explore the phenomenon of interest. Concept derivation consists of moving a concept from one field or discipline to another. After the concept to be measured is clarified, a theoretical definition is formulated that delineates the dimensions of the concept to be measured based on the result of concept clarification. Operationalization is the process of moving to a variable that is isomorphic with the theoretical definition and is measureable. Item generation involves decisions about concept dimensionality and scaling methodology.

When the phenomenon of interest is a highly abstract concept, the theoretical definition will include a number of conceptual aspects that require measurement. Less abstract concepts can often be indexed with items that tap only one or more finite aspects. For each aspect of the concept, items must be developed in a manner that assures homogeneity within that conceptual dimension. Thus, the instrument may have to be multidimensional or unidimensional, depending on the concept of interest. Typically, multidimensional concepts will be measured with instruments that have a subscale that relates to each *dimension.*

Decisions about scaling involve whether the model is meant to scale stimuli or people. Methods used for scaling stimuli are paired comparisons, constant stimuli, successive categories, and psychophysical methods. Common approaches to scaling people are cumulative (e.g., Guttman-type), differential (e.g., Thurstone-like), and summated (e.g., Likert-type) instruments. Nunally (1978) provided an excellent overview of these scaling procedures. Other decisions in item-generation include factors involved with instrument formatting. These factors relate to levels of measurement, scaling responses, and the appearance of the scale to the respondent.

Instrument testing for self-report measures involves two aspects. Initially, the content of the instrument is examined to assure its relationship to the theoretical definition of the concept. The procedures include estimates of whether the concept has been sufficiently indexed by the instrument's items and whether the format is clear and promotes response consistency. Evaluation of the link between the concept and items is primarily performed by a panel of content and instrument experts. Once it is determined that the concept is adequately indexed, a second phase of testing involves the use of the instrument with a sample from the target population.

This testing results in a quantitative examination of reliability and validity measures (see “reliability” and “validity”).

Instrument revision for self-report measures includes a critical examination of testing results and individual items. Options for items are (a) inclusion as is, (b) alteration to clarify or meet theory, and (c) elimination. Once the instrument has been revised, it must be tested again with another sample from the target population.

Instrumentation for laboratory measures involves similar phases of development and testing. However, the development phase typically focuses on the establishment of procedures for use of the device. Testing evaluates the precision, accuracy, and sensitivity of the device, given the procedures established. Examinations of precision must include calibration of the device and evaluation for inconsistency in readings, given repetitive use. Assessment for accuracy includes not only the meeting of established standards, but appraisal of appropriate theoretical specification of measurements to the concept of interest. The sensitivity of the device is very related to the accuracy but requires testing the device measurements in known change states or across a spectrum of different levels. Revisions of procedures may be needed when the results of testing do not meet established standards for precision and accuracy.

Joyce A. Verran
Paula M. Meek

INTERNATIONAL CLASSIFICATION FOR NURSING PRACTICE

Use of standardized terminologies can support the electronic capture of clinical data by nurses at the point of care delivery. These data can be reused for many purposes, including communication, clinical decision-support, knowledge generation, and policy making. The International Classification for Nursing Practice (ICNP®), a program of the International Council of Nurses (ICN), is a standardized terminology designed to represent nursing diagnoses, interventions, and outcomes. To represent nursing practice worldwide, the ICNP needs to be broad enough to capture the domain of nursing practice globally and sensitive enough to represent the diversity of nursing practice across countries and cultures. To be specific, the ICNP must be:

- broad enough to serve the multiple purposes required by different countries;
- simple enough to be seen by the ordinary practitioner of nursing as a meaningful description of practice and a useful means of structuring practice;
- consistent with clearly defined conceptual frameworks but not dependent on a particular theoretical framework or model of nursing;
- based on a central core to which additions can be made through a continuing process of development and refinement;
- sensitive to cultural variability;
- reflective of the common value system of nursing across the world as expressed in the ICN Code for Nurses; and
- usable in a complementary or integrated way with the family of classifications developed within the World Health Organization, the core of which is the *International Classification of Diseases* (ICN, 2009).

ICN, a federation of 135 national nurses associations, has provided an infrastructure to enhance the development of an ICNP. Acknowledging that there was no international terminology to describe nursing’s contribution to health, the ICN approved the resolution that launched the ICNP project in 1989. The ICNP Program has facilitated the work of many nurses around the world, resulting in the expansion of ICNP from a set of nursing concept (alpha, beta and beta 2 versions) to a logic-based nursing terminology or ontology (ICNP 1.0, 1.1, and 2 versions). In other words, based on the concern that the terminology was increasing in size and complexity, a formal mechanism to organize and maintain ICNP using Web Ontology Language was adopted from version 1.0. Using Web Ontology Language, which is underpinned by description logic, helped determine subsumption relations among concepts and organizing ICNP in a machine-interpretable format for automated reasoning (Hardiker & Coenen, 2007). A new version of ICNP will be released every 2 years in conjunction with the ICN Conference. ICN plans to launch the release of the ICNP Version 3 in 2011, at the ICN Congress in Malta.

ICN's commitment to the ICNP continues to be strengthened. The objectives and plans of the ICNP Program are identified and reviewed annually and organized into three activity clusters; (a) research and development, (b) maintenance and operations, and (c) dissemination and education (ICN, 2009). Research and development projects are initiated by ICN and by nurse and other experts worldwide. Terminology maintenance and operations is, for the most part, a set of processes internal to ICN. Dissemination and education encompass internal and external strategies and are directed at audiences worldwide. All the activities are intended to support the vision of ICN as an integral part of the global information infrastructure informing health care practice and policy to improve patient care worldwide.

For the success of the ICNP Program, partnerships are a priority for the ICNP Program. ICN already has a strong infrastructure, including collaborative relationships with the member national nurses' associations and other established nursing, health care, and governmental organizations. A new ICN initiative to facilitate collaboration is the establishment of ICN Research and Development Centers. There are currently 10 accredited centers with defined organizational structure across the world. Additionally, there is a major emphasis on worldwide participation of nurses and additional partners (such as informatics experts, researchers, and industry) in the development of the ICNP. Many individual nurses and researchers, thus have contributed to the ongoing development, testing and evaluation of ICNP. A major priority for ICN is to encourage translations of ICNP. Translations can expand opportunities for nurses to participate in research and development in their own language. Recently, ICNP was recognized as a related member of the World Health Organization Family of International Classifications, and ICN joined the International Health Terminology Standards Development Organization in an agreement to harmonize the ICNP and Systematized Nomenclature of Medicine Clinical Terms.

ICNP research projects contribute to ongoing development and include (a) concept validation studies, (b) computer-based information system demonstration projects, (c) evaluation studies, (d) subset development projects, and (e) cross-mapping projects. Evaluation studies include the degree of ICNP content coverage given a specialty area and the extent to which ICNP meets terminology requirements defined by the International Organization for Standardization.

To facilitate the use of ICNP in practice, clinically relevant subsets of ICNP nursing diagnoses, interventions, and outcomes are being developed (Coenen & Kim, 2010). For example, ICN released an ICNP subset for Palliative Nursing Care. In addition, a new Internet site, *ICNP C-Space*, was launched to facilitate collaborative work in ICNP development and evaluation, along with facilitating the dissemination of ICNP.

The vision of ICNP is to have nursing data readily available and used in health care systems worldwide. In addition to promoting comparable nursing data, the ICNP is intended to facilitate a comparison of nursing data with data from other health disciplines. It is important to understand, thus, that the ICNP will always be dynamic. Just as nursing science and technology evolve, the terminology that represents nursing practice must evolve. In addition, the ICNP must continue to meet international criteria set by standards organizations and to work in harmony with other informatics and terminology initiatives. The ongoing development and dissemination of the ICNP continue to be complementary to efforts already underway in nursing, building on and supporting the existing work in nursing classifications.

Tae Youn Kim
Amy Coenen

INTERNATIONAL NURSING RESEARCH

Driving international research through coherent frameworks and grounding it in research and experiences will help advance knowledge in the discipline of nursing. It is important to note that the concept international, as in international education, research, exchanges, and health, have been substituted in most contemporary literature into the concept of global. Global health is differentiated from international health and public health by geographical research, level of cooperation, access to health, range of disciplines, and the nature of the focus on individuals and populations (Koplan et al., 2009). With global health transcending national boundaries, requiring global cooperation, embracing populations, and preventive care within equity and interdisciplinarity models. Having a clear conceptual definition for global health and using social justice theories as frameworks (Kleinman, 2010) could help direct global research and exchanges in nursing from narratives about personal experiences to studies that produce evidence for best models of care that reflect and transcend countries (McAuliffe & Cohen, 2005).

To add to these definitions, global nursing research represents comparative research on nursing phenomena and on nursing issues conducted in more than one country. This includes research that is conducted cross-nationally to examine issues of global interest to nurses and to test and develop theories. The research is usually conducted by a nurse who resides in one country and studies phenomena in another country. The purpose is to compare the findings with the results of similar research obtained in other countries. Such research provides opportunities to clarify scientific values, explore assumptions, and develop shared frameworks.

Global research in nursing is growing with the increased opportunities for travel, networking, and collaboration. The increasing abilities of nurses to study abroad, to attend international conferences, to visit international institutions, and to communicate through electronic mail systems, enhance comparative and collaborative research projects. International scholarship has focused on the use of U.S. nursing theories and the evaluation and testing of their utilities and appropriateness to the different nursing cultures. There are many descriptive and analytical dialogues related to theory in the international literature. These dialogues have resulted in scholarly publications related to the introduction and analysis of U.S. theories in many countries.

Human resources analyses and investigations led to several international projects. Questions related to the image and status of nursing, shortage of nurses, and distributions of nurses in urban and rural settings were examined. The results were compared and contrasted among and between countries and regions. There is general agreement among researchers in many countries on the perception of nursing and the difficulty in recruitment of students and retention of nurses in the workforce.

There are commonalities in nurses' reasons for leaving their countries and seeking employment in other countries or regions. Nurses emigrate to seek better job opportunities, to secure a better future for their children, to improve their skills, and to complete their graduate education.

Other research areas that received the attention of global nurses were the caring practices of nurses and the relationship between nurses' cultural heritage and language and patients' cultural heritage and their primary language of communication. There is beginning evidence that nurses of multicultural heritage who speak more than one language tend to provide more culturally competent care. Research focused on nursing theories tends to draw on communities of scholars from different countries.

Other areas of comparative and collaborative research were focused on women's health and quality of life. Questions about women's health were considered within a sociopolitical context, with attention to health and health care in the overall development of women through better options, more education, and higher status. Other research examples were in ethical and clinical decision making, pain management, and the management of the care of the elderly.

Future international research requires the development of culturally competent methods, analysis of ethical issues in conducting collaborative international research, development of guidelines for international collaboration, and a framework for decisions related to data ownership, authorship, and culturally sensitive rules for data dissemination.

The International Council of Nursing, in collaboration with the U.S. Institute for Nursing Research, developed a list of priorities for international research, which addressed the urgency for preparing researchers internationally and providing international strategies to support nursing research. A future direction for priorities in substantive research questions has to be identified to enhance international collaboration and provide nurses with shared goals.

One important framework for global nursing research are the eight United Nations Millennium Development Goals to be achieved by 2015 (United Nations, 2000). According to the Institute of Medicine's report on the U.S. Commitment to Global Health (Institute of Medicine, 2009) there are areas for action that warrant careful review in directing nursing scholarship. These include scaling-up interventions to achieve health gains, addressing health problems endemic to the global poor, investing in developing the capacity of global partners, and developing models for engaging in respectful partnerships.

Afaf Ibrahim Meleis

INTERPERSONAL COMMUNICATION: NURSE–PATIENT

Interpersonal communication refers to a function of language and is one of the most important skill sets in nursing practice. It is what nurses' use with both spoken and written words in the formation and maintenance of the therapeutic relationship with patients. It is central to the work of a profession whose service outcomes depend on the skillful blending of interpersonal and clinical expertise, as effective delivery of health care depends to a great extent on the quality of communication between health care providers and their patients. Interpersonal communication encompasses both verbal and nonverbal aspects of the interaction within the context of the therapeutic relationship.

Interpersonal communication is distinct from therapeutic communication, and the two terms should not be used interchangeably because they are not synonymous.

Interpersonal communication is a form of communication and therapeutic communications is a subtype of interpersonal communication. Interpersonal communication skills are the basic foundation and underpinnings for therapeutic communication outcomes. Ideally, interpersonal communication is born between the nurse and the patient, from the nurses' conscious application of an interpersonal model of practice. Therapeutic communication is then the aggregate result from the entire process.

Interpersonal communication is the primary means by which patients learn about their particular health problems, appropriate prevention and treatment strategies, and the roles both nurses and patients play in achieving health outcomes. Within the nurse–patient relationship, interpersonal communication should primarily be concerned with the development, for the patient, of a clear and adequate conception of the experience of the illness (Peplau, 1991).

Discussion of the parameters of interpersonal communication in nursing care can be found as far back as 1858. Florence Nightingale had published *Notes on Nursing* and pointed out in the section "Chattering Hopes and Advices," that much damage can be done by what is said to a sick patient. Giving false hopes and discussing personal matters that are anxiety-producing is not helpful in restoring the patient to health (Nightingale, 1992). Heightened focus on the importance of interpersonal communications in the nurse–patient relationship occurred during the 1950s with the work of nurse theorist, Hildegard Peplau, who introduced an interpersonal model to guide nursing practice. What was said, how it was said, and why it was said, became the focus of many student nurses' process recordings in conversations with patients. Joyce Travelbee, another theorist, furthered the importance of interpersonal communication in 1971 with the publication of *Interpersonal Aspects of Nursing.* The importance of "relatedness" to the client and their situation was integrally linked to interpersonal communications. Further emphasis on systematically studying the interactive process, ascertaining the content of the communication, and deciding whether or not what is being communicated is assisting in the nursing situation was encouraged (Travelbee, 1971).

Interpersonal communication in health care is often complex—influenced by personal characteristics and interaction styles of nurses, patients, or patient companions as well as contextual factors. The majority of research on provider–patient communication has occurred over the past 30 years. The focus of this research has been on communication styles and strategies that occur within the provider–patient relationship. Physicians' verbal communication has been studied far longer and more frequently than that of any other type of health care provider. Researchers have largely ignored the role of nonphysician providers and have excluded them from communication analysis. Much of what is known from this research is limited to what is said by White male primary-care physicians during initial acute-care visits (Roter, 2003).

Although nurse–patient communication has been examined during this time period and provided a basis on which to describe the types of communication styles used by nurses in practice, most of the current communication research remains exploratory and descriptive, and appears to be driven by validating assessment tools and coaching on technique rather than application of interpersonal theories. Problems, such as how to deal with interpersonal communicating barriers in ventilated patients, again resulted in a description of barriers and strategies for dealing with them but failed to integrate interpersonal theories into the remedy (Laakso, Hartelius, & Idvall, 2009). Interpersonal communication practices of student undergraduate nurses and student graduate nurses have also been studied but again this was not tied to an interpersonal nursing model of practice (Klakovich & Dela Cruz, 2006). Teaching strategies for improving nursing student's interpersonal communication skills were also explored without any reference to interpersonal models of practice as a guiding factor (Jones, 2007). Interpersonal communications problems in the emergency room have also been studied. The relationship to interpersonal models of practice was inferred but not explicitly correlated (Kelly, 2005).

The importance of this correlation has been previously documented. In her observation of nurse–patient interactions, Peplau discovered that nurses who practiced from an interpersonal model reported that as they attended to what they were feeling during the evolution of the relationship, they become aware of empathic observations that drove the interpersonal conversation into important areas that the patient may not have even noticed or talked about (O'Toole & Welt, 1989).

Between 2005 and 2010, approximately 139 research articles appeared in a literature review of therapeutic communications in nursing (CINAHL, 2010). Few (~3.5%) are devoted to interpersonal communication as being driven by the theoretical structure of the interpersonal relationship specifically. Within the small percentage studying this correlate was the navigation of Orem's self-care theory and the relevance of using interpersonal communication to facilitate the process in ostomy patients. Although not an interpersonal theory per se, it nevertheless tied interpersonal prompts to concepts of a nursing theory (Sampaio, Aquino, de Araujo, & Galvao, 2008).

More explicit research connecting nurses and how nurses choose to respond to patients from a social processing and an interpersonal nursing model (Orlando) have been investigated (Sheldon & Ellington, 2008).

The application of interpersonal communication as structured within a nursing theoretical paradigm is an important area for future research because the concepts of interpersonal communication and therapeutic relationships are inherently linked. Interpersonal communication and Peplau's model is currently being explored as applied to cyber-nursing and has been found to still be relevant (Hrabe, 2005).

Discoveries in knowledge about the presumed mechanisms behind the effects of communication will occur only when theory-driven questions and hypotheses are systematically asked and tested. In addition to being studied as a process, communication may serve as an outcome, a predictor, a mediator of a process, or a moderator of relationships among other variables. When these issues begin to be addressed, the profession will be better able to determine how the findings on nurse–patient communication and interpersonal relations research can be used to affect the clinical and educational aspects of nursing.

Marjorie Thomas Lawson
Updated by Jeffrey Schwab Jones

J

JOB SATISFACTION

Job satisfaction is the degree to which individuals like their jobs. It has been studied extensively from multiple perspectives, including economics, psychology, nursing, sociology, and organization science. Researchers have studied job satisfaction as a dependent variable in assessing the impact of organizational changes or as an intervening variable with multistaged models of employee turnover, retention, or absenteeism. More recently nurses' job satisfaction is being examined, along with variables such as nurse staffing, autonomy, empowerment, safety climate, and burnout, as part of the work context that affects patient care outcomes such as patient satisfaction, length of stay, adverse events, mortality, and costs.

Job satisfaction is a complex construct with multiple conceptual influences. Among the most important influences are Maslow's (1954) Hierarchy of Needs and Hertzberg, Mausner, and Bynderman's (1959) Motivator-Hygiene Theory. As a complex construct, job satisfaction has both perceptual and attitudinal components, both an evaluation of how well a job meets one's needs and an affective orientation to the job (Tovey & Adams, 1999). As a perceptual construct, job satisfaction reflects an evaluation of the extent to which the job meets one's expectations and needs, ranging from physiological and safety needs to self-actualizing career development. As a general attitudinal construct, job satisfaction reflects a positive affective orientation toward work and the organization, whereas job dissatisfaction reflects a negative affective orientation.

In early studies of organizations, workers' liking or disliking their jobs usually was labeled morale. Midway through the twentieth century, researchers began to develop both general and dimension-specific measures of satisfaction and dissatisfaction. General or global measures estimate an individual's overall feelings about the job. In dimension-specific measures, subconstructs distinguish satisfaction about specific facets of the job, such as the work or task, pay and benefits, administration, and, for nurses, dimensions such as professional status, nurse–physician relationships, and quality of care.

Global job satisfaction is measured by items that directly ask about the job overall, either in single items or in multiple item scales. Scales measuring global job satisfaction are often developed from subsets of the Brayfield and Rothe (1951) instrument. Dimension-specific tools measuring nursing job satisfaction include similar components. The McCloskey–Mueller Satisfaction Scale (Mueller & McCloskey, 1990) includes extrinsic rewards (salary, vacation, and benefits), scheduling, balance of family and work, coworkers, interaction opportunities, professional opportunities, praise and recognition, and work control and responsibility. The Index of Work Satisfaction (IWS; Stamps, 1997) includes task, interaction, decision making, autonomy, professional status, and pay. The nurse job satisfaction instrument endorsed by the National Quality Forum, the Practice Environment Scale of the Nursing Work Index (PES-NWI) (Lake, 2002), includes nurse participation in hospital affairs; nursing foundations for quality of care; nurse manager ability, leadership, and support of nurses; staffing and resource adequacy; and collegial nurse–physician relations.

Developers of some dimension-specific tools report techniques for calculating a composite measure. For example, Lake (2002) describes averaging the subscale scores for a PES-NWI total score. Composite scores derived from dimension-specific instruments should be distinguished from estimates of global job satisfaction.

Researchers choose measures of job satisfaction based on the aims of the study. Global job satisfaction tools are most often used to predict important employee outcomes such as turnover or patient outcomes such as mortality. Dimension-specific scales are used to examine different strengths and weaknesses of organizations and to assess the effectiveness of targeted interventions.

Important conceptual and measurement issues complicate the study of nursing job satisfaction. It is unclear whether job satisfaction and dissatisfaction are opposite ends of a single continuum or two separate constructs. Although job satisfaction currently is reported most often in the literature, the terms satisfaction and dissatisfaction are used inconsistently and sometimes interchangeably. A more recent concern is the possibility that positive and negative affectivity, which are mood-dispositional personality traits, contaminates effects of determinants (e.g., autonomy, stress, burnout) on strain-related variables such as job satisfaction. In a meta-analysis of affective underpinnings of job perceptions, Thoresen, Kaplan, Barskky, Warren, and de Chermont (2003) found that both positive and negative affect uniquely contributed to the prediction of job satisfaction, organizational commitment, emotional exhaustion, and personal accomplishment.

The multilevel nature common in job satisfaction research requires alignment of conceptual and measurement levels of studies. Most job satisfaction instruments were developed and validated for individuals. Taunton et al. (2004) adapted the IWS for use in the National Database of Nursing Quality Indicators (NDNQI®). The adaptation aligned NDNQI-adapted IWS data with other unit-level database indicators (e.g., nursing care hours per patient day, nursing staffing mix, pressure ulcers, patient falls, and patient satisfaction) as part of the American Nurses Association Safety and Quality initiative. Boyle, Miller, Gajewski, Hart, and Dunton (2006) reported further examination of the unit level properties of the NDNQI-adapted IWS. Individual-, unit-, and organization-level psychometric properties have been reported for the PES-NWI (Gajewski, Boyle, Miller, Obserhelman, & Dunton, 2009; Lake, 2002). Although job satisfaction has most frequently been examined at the individual or organization level, significant differences between acute care unit types have been found (Boyle et al., 2006). These differences highlight the need to carefully consider the most appropriate level in all study designs.

The important effect of cultural values on nursing job satisfaction is not well understood. Recently, progress has been made in validating instruments for nurses in an increasing number of countries, advancing our understanding of the job satisfaction in the international nursing community. The migration of nurses in response to the evolving global nursing shortage brings new measurement challenges in destination countries. In addition, the effects of changes in social values and orientation to work over time and across age groups are not well understood. Researchers also must consider modifications in nursing job satisfaction theory and measurement required by the profound changes occurring in health care facilities, particularly in the role of technology as well as in organizational structure and management (Tovey & Adams, 1999).

Researchers (Blegen, 1993; Irvine & Evans, 1995) conducting meta-analyses of accumulated nursing job satisfaction research have found that autonomy, stress, commitment to the organization, and intent to stay in the job demonstrate the strongest, most consistent correlations with job satisfaction; autonomy and stress usually are antecedents of job satisfaction, whereas commitment and intent to stay are outcomes. Other variables with more moderate correlations are communication with supervisor, recognition, routinization, communication with peers, fairness, and locus of control. In general, variables measuring job characteristics (e.g., routinization, autonomy) and work environment (e.g., leadership, stress) have stronger relationships than economic (e.g., pay, opportunity elsewhere) or individual difference (e.g., age, experience, organizational tenure) variables. More recently, researchers of the organizational context for nursing have found higher nurse-to-patient ratios are associated with lower job satisfaction and higher emotional exhaustion as well as higher patient risk-adjusted mortality and failure to rescue (Aiken, Clarke, Sloane, Sochalski, & Silber, 2002).

A high priority for current and future research is examining the relationship between nurses' job satisfaction and outcomes of care, such as quality of care, patient satisfaction, adverse events (e.g., falls, pressure ulcers, failure to rescue, and hospital-acquired infections), mortality, and the like. These relationships need to be studied not only with RNs in acute care settings, but in the community, home care, and long-term care facilities with all members of the nursing workforce. Exploring the potential contribution of nurse job satisfaction in research testing interventions for improving patient care and outcomes is imperative.

Several issues surrounding nursing job satisfaction need more elucidation. First, the issue of whether job satisfaction and dissatisfaction are separate constructs warrants further attention, as nurses' satisfaction and dissatisfaction may associate differently with outcomes of care. Second, the degree to which nurses' positive and negative affectivity confound relationships between job satisfaction and variables such as autonomy, job stress, burnout, and emotional exhaustion is not clear. Last, the effect of diverse cultural values needs further study, as well as changes over time in health care organizations and in social values effecting employment.

Peggy A. Miller
Diane K. Boyle

JOHNSON'S BEHAVIORAL SYSTEM MODEL

Johnson's behavioral system model is a nursing conceptual model developed in response to a need to clarify nursing's social mission directed to the care of human beings and identify the nature of the body of knowledge needed to attain the goal of nursing. Within the model, seven behavioral subsystems carry out specialized functions needed to maintain the integrity of the whole behavioral system and to manage its relationship to the environment. Behavioral actions associated with each subsystem are motivated by a particular drive and reflect the person's predisposition to act in certain ways as well as all of the choices for actions that are available to the person.

The function of the *attachment or affiliative subsystem* is the security needed for survival as well as social inclusion, intimacy, and formation and maintenance of social bonds. The function of the *dependency subsystem* is the succoring behavior that calls for a response of nurturance as well as approval, attention or recognition, and physical assistance. The *ingestive subsystem* is concerned with the function of appetite satisfaction in terms of when, how, what, how much, and under what conditions the person eats, all of which is governed by social and psychological considerations as well as biologic requirements for food and fluids. The *eliminative subsystem* is concerned with the function of elimination in terms of when, how, and under what conditions the person eliminates wastes. The functions of the *sexual subsystem* are procreation and gratification with regard to behaviors dependent on the person's biologic sex and gender role identity, including but not limited to courting and mating. The function of the *aggressive sub*system is protection and preservation of self and society. The function of the *achievement subsystem* is mastery or control of some aspect of self or environment, with regard to intellectual, physical, creative, mechanical, and social skills as well as the skills needed to take care of children, partner, and home.

Nurse administrators at the University of California–Los Angeles Neuropsychiatric Institute and Hospital developed and implemented the behavioral system model–guided role of the "attending nurse" (Dee & Poster, 1995; Moreau, Poster, & Niemela, 1993; Niemela, Poster, & Moreau, 1992). The attending nurse is regarded as a comprehensive clinical case manager, with responsibilities encompassing direct patient care; delegation and monitoring of selected aspects of nursing care; provision of leadership, consultation, and guidance to nursing staff; and collaboration with multidisciplinary team members. The model of the attending nurse has spread nationally (Fulton, 2008) and internationally (Assad & de Oliveira Viana, 2005) and has been incorporated into a separate model of nursing care delivery associated with Watson's Theory of Human Caring (Watson & Foster, 2003).

Research based on the model describes disorders that arise in connection with illness. The ultimate purpose of behavioral system model–based research is to determine the effects on behavioral system balance and stability of nursing actions, including provision of protection, nurturance, and stimulation; temporary imposition of external regulatory or control mechanisms; and fostering changes in the person's behavioral set, choices, and actions. Those actions are specifically directed toward "fostering of efficient and effective behavioral functioning in the patient to prevent illness and during and following illness" (Johnson, 1980, p. 207).

Jacqueline Fawcett

K

KANGAROO CARE (SKIN-TO-SKIN CONTACT)

Most nurses working in an intensive care nursery have witnessed parents expressing intense need to hold their ill preterm infants. A relatively new way to address this need is *kangaroo care* (KC), a term derived from its similarity to the way marsupials mother their immature young. During KC, mothers simply hold their diaper-clad infant underneath their clothing, skin to skin (chest to chest) and upright; if needed for warmth, a cap and a blanket across the infant's back may be added. In complete KC mothers allow self-regulatory breastfeeding.

KC represents a blend of technology and natural care. The method (also known as skin-to-skin contact) began in Bogotá, Colombia, is widespread in Scandinavia and Africa, and is proliferating elsewhere. In developing countries, the method is called kangaroo mother care because mothers are usually the central figure responsible for continuous care and almost exclusive breastfeeding. Nyqvist et al. (2010a, 2010b) recommends naming this continuous kangaroo mother care and using the term intermittent kangaroo mother care for what usually occurs in developed countries.

Full-term infants also are vulnerable during the physiologically demanding intrauterine–extrauterine transition after birth and therefore benefit from KC (Moore, Anderson, & Bergman, 2007). A Cochrane review protocol of KC for preterm and low–birth weight infants in the NICU has just been submitted (Moore, Bergman, Anderson, Rojas, & Chiu, 2010).

Relevant theoretical paradigms include mutual caregiving and self-regulation (Anderson, 1977, 1989, 1999) and stress reduction (programming, inappropriate stress responsivity, and allostatic load; McEwen, 1998), all physiological/developmental and life span in nature, and Fitzpatrick's Rhythm Model, Levine's Energy Principles, Nightingale's Model, Orem's Self-Care Model, Rogers' Energy Fields, and Roy's Adaptation Model (Fitzpatrick & Whall, 1996).

KC has five categories, based primarily on how soon KC begins (Anderson, 1995). Late KC, still most common in the United States, begins when infants are stable in room air and approaching discharge. Intermediate KC begins after the early intensive care phase; usually oxygen is needed and some apnea and bradycardia occur. Also included are infants who are stabilized with mechanical ventilation and infants who, although too weak to nurse, are placed at the breast during gavage feedings, a method that facilitates lactation. Early KC is for easily stabilized infants and begins as soon as stabilization occurs, usually during the first week and perhaps even the first day after birth. Very early KC begins in the delivery or recovery room 15 to 60 minutes after birth. With birth KC, infants are returned to their mothers immediately after birth. The rationale for these last two categories is that the mother can help to stabilize her infant (Bergman, Linley, & Fawcus, 2004).

Numerous important variations of KC have been reported as separate case studies, mostly in *MCN: The American Journal of Maternal Child Nursing*. Examples are twins and adolescent parents, triplets, an intubated preterm infant, full-term infants having breastfeeding difficulties, a near-term infant with gastric reflux, adoptive parents, and a mother who felt depressed during early postpartum (Anderson, Dombrowski, & Swinth, 2001). Other journals that frequently publish KC articles include *Acta Paediatrica*, *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *Neonatal Network*, and *Journal of Neonatal Nursing*.

KC is safe and has health benefits based on evidence (Nyqvist et al., 2010a, 2010b). In the United States, nurses have done most of this research. Findings included adequate warmth, energy conservation, regular heart rate and respirations, fourfold decrease in apnea, adequate oxygenation, more deep sleep and alert inactivity, less crying, less cranial deformity, no increase in infections, fewer days in incubators, greater weight gain, earlier discharge, and increased and longer lactation and breastfeeding. Morelius, Theodorsson, and Nelson (2005) found that maternal salivary cortisol, which was high at baseline, decreased during the initial KC session and decreased further across repeated sessions. KC was also analgesic for infants, provided mothers felt relaxed (Gray, Watt, & Blass, 2000). Fathers also gave KC effectively, as did grandparents, young siblings, and selected important others. Parents feel more fulfilled, become deeply attached to their infants, and feel confident about caring for them even at home. Cost-effectiveness and improved long-term outcomes are apparent but not yet evidence-based.

The National Institute of Nursing Research has funded nurses to conduct at least six randomized trials with preterm infants and KC interventions. Five trials have been conducted by Ludington: three were with infants in open-air cribs, in incubators, and on mechanical ventilation, one on sleep and brain development measured by electroencephalogram, and one on blunting of pain measured by heart rate variability (Ludington-Hoe, 2010; http://report.nih.gov). The sixth trial was with 32- to 36-week infants beginning KC on average 4.5 hours after birth (e.g., Anderson et al., 2003). In a pilot trial for the funded trial, late preterm infants (32–36 weeks) began KC by 30 minutes after birth, continued 84% of the time, had remarkable behavioral organization, began breastfeeding exclusively by 2 hours, and were breastfeeding competently by 24 hours. Importantly, two infants developed respiratory distress (grunting) before KC began, but this disappeared quickly while the infants remained in KC and received warmed humidified oxygen via oxyhood; the warmth and humidity are essential (Ludington-Hoe et al., 1999). Randomized trials in developing countries, Europe, and Taiwan have also been done.

Although fully implemented in some hospitals, use of KC generally remains scattered. The method is not allowed in some hospitals and might not last in others because of resistance from some hospital staff with resultant variable support for parents. An elegant model for introducing the method and effecting desired change and implementation is described by Bell and McGrath (1996). KC benefits are surely dose related. Thus, parental burdens (e.g., transportation needs, time required, fatigue, discomfort, concern about home-related responsibilities, stress, anxiety) warrant creative initiatives, including broad social services to facilitate relaxation and extend caregiving to the mother's home (Anderson et al., 2003).

Other trends in KC include increasingly rigorous research, federal funding, publication of detailed guidelines (e.g., World Health Organization, 2003), conferences devoted to KC, increased networking (Ludington, 2010), KC routinely provided to more vulnerable infants and to full-term infants and provided by selected family members or friends, a new focus on late preterms (Raju, Higgin, Stark, & Leveno, 2006), consumer awareness of and desire for KC, and increased use of KC to facilitate lactation and breastfeeding especially for dyads having breastfeeding difficulties. The new realization that very early KC can help stabilize some preterm infants and even prevent NICU admission has increased interest in giving KC as soon as possible after birth, as often as possible thereafter, and for as long as possible each time. Nursing research is needed to test the great potential that these various forms of KC have for quality care, stress reduction, and mutual relaxation for the mother–infant dyad and the family, improved outcomes, parental satisfaction, and cost reduction.

Gene Cranston Anderson

KING'S CONCEPTUAL SYSTEM AND THEORY OF GOAL ATTAINMENT

Introduced in 1981, Imogene King's theory focused on individuals as personal systems, two or more individuals as interpersonal systems, and organized boundary systems that regulate roles, behaviors, values, and roles as social systems. Concepts for understanding personal systems are perception, self, growth and development, body image, learning, time, personal space, and coping. Concepts important for understanding interpersonal systems are interaction, communication, role stress/stressors, and transaction. Concepts useful for understanding social systems are organization, authority, power, status, and decision making. Perception, interaction, and organization are comprehensive concepts for personal, interpersonal, and social systems, respectively. Perception is a process of organizing, interpreting, and transforming information from sense data and memory (King, 1981, p. 24). Interaction is defined as two or more persons in mutual presence and includes a sequence of goal-directed behaviors (King, 1981, p. 85). Organization is a system whose continuous activities are conducted to achieve goals (King, p. 119). As a grand level theory, King's Conceptual System provides a distinct focus for the discipline, the process of nursing, and a framework for deriving middle-range theories.

The middle-range theory derived from the conceptual system was King's Theory of Goal Attainment (King, 1981). This theory is focused on nurse–client interactions that lead to transactions and goal attainment. King developed a classification system of behaviors in nurse–patient interactions that lead to transactions and goal attainment. The key behaviors in the process of transactions include mutual goal setting, exploration of means to achieve goals, and agreement on means to achieve goals. The theory of goal attainment specifies the process of nursing and emphasizes nursing outcomes. Outcomes are defined as goals achieved and can be used to evaluate the effectiveness of nursing care.

In the past 2 decades, there has been a considerable extension and application of King's Conceptual System and Theory of Goal Attainment (Frey & Sieloff, 1995). Also, middle-range theories are derived from the conceptual system. In addition to King's theory of goal attainment, middle-range theories derived by others address family (Doornbos, 2000; Wicks, 1995), health outcomes in children with chronic conditions (Frey, 1995), empathy (Alligood, 1995), and nursing department power (Sieloff, 2003). Each theory represents an ongoing program of research.

Maureen A. Frey

L

Leininger’s Theory of Culture Care Diversity and Universality

The theory of Culture Care Diversity and Universality is derived from the disciplines of nursing and anthropology. Madeline Leininger conceptualized the theory in the mid 1950s as a way to bridge the gap between nursing care and culture (Leininger, 2006). Leininger is credited with establishing transcultural nursing and coining the term “culturally congruent care” (Leininger, 2006; McFarland, 2006). According to Leininger, culture care is the broadest holistic means of knowing, explaining, interpreting, and predicting nursing care phenomena to guide nursing practice. Culturally congruent care is beneficial care and occurs only when the culture care values, expressions, or patterns of the client (individual, group, family, or community) are known and used in appropriate and meaningful ways by the nurse (Leininger, 1995, 2002, 2006).

Leininger established the theory of culture care to account for and explain much of the phenomena related to transcultural nursing. The purpose of the theory is to discover human care diversities and universalities, whereas the goal of the theory is to improve and provide culturally congruent care (McFarland, 2006). The components of the theory are depicted in the Sunrise Model. Although Leininger provides orientational definitions for the concepts in the model, she discourages the use of operational definitions in the study of culture care (Leininger, 2006). Leininger supports exploring and discovering the essence of care for a particular culture and puts forth the theory of culture care worldwide as necessary research for epistemic knowledge for the profession of nursing. The theory has three theoretical modes: cultural care preservation and/or maintenance, cultural care accommodation and/or negotiation, and cultural care repatterning or restructuring (Leininger, 2006). The three modes were developed based on Leininger’s experiences with using culture care knowledge to assist clients in several Western and non-Western cultures. According to Leininger, the modes are care centered and use both emic (generic or folk care) and etic (professional care) knowledge. Culture care diversity points to the differences in meanings, values, patterns, and lifeways that are related to assistive, supportive, or enabling human care expressions, within or between collectives while culture care universality points to the common, similar, or dominant uniform care meanings (Leininger, 1995, 2006).

Leininger defines health as “a state of well being that is culturally defined, valued, and practiced, and which reflects the ability of individuals (or groups) to perform their daily role activities in culturally expressed, beneficial, and patterned lifeways” (Leininger, 1991, p. 47). Care is described as being essential to curing, healing, health, well-being, and survival. Care is also presented as the dominant and unifying feature of nursing and one of the most important concepts of transcultural nursing (Leininger, 1985, 1995, 2006). Nursing is presented as a transcultural humanistic and scientific profession and discipline, whose central purpose is to serve human beings worldwide. The ethnonursing research method was designed to systematically explore the purpose, goal, and tenets of the theory through a naturalistic and predominantly emic open inquiry discovery approach (Leininger, 2006). Ethnonursing focuses on the study of nursing care beliefs, practices, and values, cognitively perceived and known by a particular culture through their experiences, beliefs, and value systems.

Over the past 40 years, Leininger's theory of culture care has become well known and valued by nurses and health professionals worldwide. The *Journal of Transcultural Nursing,* which was founded by Leininger in 1986, has been a major source for dissemination of caring constructs, culture care information, and research findings from transcultural nurse researchers (Leininger, 2007).

Sandra C. Garmon Bibb

M

Maternal Anxiety and Psychosocial Adaptation During Normal and High-Risk Pregnancy

Pregnancy, with its joyful expectation, also is expected to be accompanied by some risk to the life of the mother, baby, family, and other children. The risks often extend on a continuum and are well documented from pregnancy throughout life; these elements are documented below by Rich-Edwards and Grizzard (2005). The psychosocial and psychophysical factors identified with high-risk pregnancy and preterm birth (PTB) are thought to be interrelated in a host of ways:

- Psychosocial stressors: low income and education, lack of a partner, and minority status. Behavioral and physical factors may further complicate maternal risk status.
- "Weathering": sharp age-related risk of poor pregnancy outcomes in black high-risk mothers and those with low socioeconomic factors and neighborhood poverty.
- Chronic stress: long-term poverty, racism, and lack of neighborhood safety so that the reproductive axis may be vulnerable to chronic stress.
- Maternal endocrine and immune systems already predisposed to chronic stressors before conception, which may create vulnerabilities to pregnancy complications and preterm delivery.
- Neuroendocrine pathways between chronic stress and PTB are exemplified by the "weathering" hypothesis, altering neuroendocrine mechanisms risks for PTB.
- Plasticity of the hypothalamic–adrenal–pituitary axis through life, modifiable by the environment, to create hypervigilance to condition or kindle future stress responses.
- Placental hormones (e.g., CRH). Up-regulation of hormones by both maternal and fetal cortisol correlate inversely with gestational length and parturition triggering.
- Neuroendocrine infection/inflammation of the maternal tract that occurs in 20% to 30% of PTB (McLean et al., 1995; Rich-Edwards & Grizzard, 2005; Teixteira, Fisk, & Glover, 2003; Warren, Patrick, & Goland, 1992).

Publications prepared by Behrman and Butler (2007) and review panels on the prevention of PTB by the U.S. Office of the Surgeon General and the Eunice Kennedy Shriver National Institute of Child Health and Human Development (2008) made several novel recommendations for research on the assessment of PTB risk factors and personalized, specific interventions for prevention. Many recommendations imply a significant nursing role in psychosocial normal and high-risk assessment and intervention. Emphasis is placed on assessment of pregnancy-specific anxiety, and on assessment/intervention methods that focus on family system methodologies that include the father/partner, spouse, couple, and other family members.

Although the surgeons general's conference covered several pertinent topics, this entry focuses on those with particular relevance to nursing practice, education, and research. Topics that appear to be of particular importance to nursing are

(1) psychosocial and behavioral factors in PTB, (2) professional education and training, (3) communication and outreach, and (4) quality of care and health services. Conference recommendations affecting normal and PTB are as follows:

- Identify needs in research, screening, and clinical care
- Target African Americans as a priority for research services
- Make research on the effects of race, racism, and social injustice a priority

The following are topics of concern in the near term:

- Develop a panel to study preterm stress—definition, conceptualization, measurement, and biological correlates of PTB
- Improve measurement of psychosocial and behavioral risk factors and promote consistency of measures. Preferably use instruments with sufficient content to provide guidelines for informed psychosocial interventions (Lederman and Weis, (2009)
- Collect and conduct data analyses to enable high quality evaluation of intervention.

Topics of concern in the midterm are:

- Determine parameters that foster individual decision making of health behaviors and develop interventions to foster the decision-making process.

Long-term concerns are:

- Shift from a risk-based to an assets-based approach to identify protective factors and alleviate stress factors for decreasing stress associated with PTB.
- Develop study methods over the life span to obtain multideterminant causal models: careers factors, measurement methods, interactions among data, and causal pathways.

Specific recommendations for increased nursing assessment and intervention to prevent material anxiety and psychosocial adaption to parenting include the following:

1. Assessment and treatment of perinatal depression and anxiety. High prenatal anxiety and depression was found among even diverse samples. Goodman and Tyer-Viola (2010) found 23% screened positive for anxiety disorder and high depressive symptoms with very low evidence of treatment. The significance of fetal programming with changes in the fetal environment during sensitive development that may cause both long-lasting life changes, and serious chronic disease is receiving increasing scientific attention (Schlotz & Phillips, 2009). Research shows that neonatal auditory-evoked responses are related to perinatal maternal anxiety, particularly in attention allocation (Harvison, Molfese, Woodruff-Borden, & Weigel, 2009). Depressed mothers are less responsive to their infants and voices (Field, Diego, & Hernandez-Reif, 2009). Confirmed maternal anxiety from pregnancy to 5 years postbirth was associated with children experiencing attention problems from 5 to 14 years (Clavarino et al., 2010). Also, high midpregnancy anxiety was associated with decreased gray matter density in children 6 to 9 years old (Buss, Davis, Muftuler, Head, & Sandman, 2010). Indications are emerging that the early prenatal environment may have long life consequences for psychological development and mental health, including temperament, adult personality, mental health, and negative personality consequences (Raikkonen & Pesonen, 2009). The two- to threefold larger incidence of PTB for African American women, the effects of racism (Gavin, Chae, Mustillo, & Kiefe, 2009; Nuru-Jeter et al., 2009), and the single-mother homes and/or parental conflict could further compound these negative high-risk PTB and very low birth weight (VLBW) infant health disparities (Kramer & Hogue, 2009).

2. Assessment of prenatal psychological and psychosocial adaptation to pregnancy.

The largest general factor accounting for pregnancy adaptation for men and women (Durkin, Morse, & Buist, 2001) was psychological dysphoria (i.e., anxiety, anger, and gender role stress). The remaining factors influenced adaptation of both partners but varied in gender proportions: individual relationship functioning, social support from family and friends, and recalled quality of childhood family relationship, which are supported by other research (Finger, Hans, Bernstein, & Cox, 2009; Fonagy, Steele, & Steele, 1991). These variables accounted for 46.5% of the variance for prenatal psychosocial adaptation. The results underscore the need for assessment and interventions, particularly for individual and for marital and parental relationship factors. Nurses can address these needs through continuing education workshops to advance their psychotherapy knowledge and skills to conduct individual and couple relationship therapy. Jallo, Bray, Padden, and Levin (2009) have provided positive evidence of PTB birth outcomes through nurse home visitation with a 37% reduction in PTB compared with women not receiving the program. The program included dietary improvement, counseling for family communication, and improved patterns of prenatal care. Similar results are cited others (Goering, 2009). The significance of nurse psychosocial and psychotherapy contributions to PTB prevention deserves substantial attention from health care delivery organization providers.

3. *Strengthening families*. Research paradigms (Lu, 2010) suggest foci for optimization of health care across the life span, including social determinants, increased access to high quality health care, and community prevention and wellness programs to strengthening families.

Examining couple intentions for pregnancy and particularly their relationship has critical implications for father involvement and maternal seeking of prenatal care (Hohmann-Marriott, 2009) as well as potential life health and other consequences of these decisions for the child and the family. The involvement of men in pregnancy is increasingly recognized as significant to pregnancy outcomes. Researchers (Genesoni & Tallandini, 2009) cited the significance of psychological reorganization of the self for men during pregnancy and self-image transformation, triadic relationship development, and social environmental influences. Partner relationship and environmental work-related challenges also are struggles for new families.

Finally, the complex, challenging decision-making processes of families expecting PTB or VLBW infants (Kavanaugh, Moro, Savage, Reyes, & Wydra, 2009) are addressed. Parents and families need assistance in making decisions about life support and care after birth. Nurses have a significant role in assisting families with these challenges, and by compassionately imparting information to enable parents to make treatment decisions that may have lifelong consequences for the health of all family members.

Regina Placzek Lederman

MEASUREMENT AND SCALES

The focus of measurement is the quantification of a characteristic or attribute of a person, object, or event. Measurement provides for a consistent and meaningful interpretation of the nature of an attribute when the same measurement process or instrument is used. The results of measurement are usually expressed in the form of numbers. Measurement is a systematic process that uses rules to assign numbers to persons, objects, or events, which represent the amount or kind of a specified attribute (Pedhazur & Schmelkin, 1991; Waltz, Strickland, & Lenz, 2010). However, measurement also involves identifying and specifying common aspects of attributes for meaningful interpretation and categorization, using a common conceptual perspective. Ambiguity, confusion, and disagreement will surround the meaning of any measurement when it is undefined. The measurement relevancy can be determined only when an explicit or implicit theory structures the meaning of the phenomenon to be studied. "Theory not only determines what attributes or aspects are measured but also how they are to be measured" (Pedhazur & Schmelkin, 1991, p. 16). Qualitative assessments apply measurement principles by providing meaning and interpretation of qualitative data through description and categorization of phenomena. Thus, measurement may not result in scores per se but may categorize phenomena into meaningful and interpretable attributes. Therefore, measurement is also basic to qualitative analysis (Strickland, 1993b).

Measurement is a crucial part of all nursing settings. Nurses depend on measuring instruments to determine the amount or kind of attributes of patients and use the results of measurements such as laboratory and physical examination results to determine patient needs and their plan of care. Nurse researchers use a large array of physiological, clinical laboratory, observational, and questionnaire measures to study phenomena of interest. Nurse educators depend on measurement instruments and test scores to help determine a student's mastery. Measurement is central to all that nurses do. We cannot understand or "study well what we cannot measure well" (Strickland, 1993a, p. 4).

The rules used for assigning numbers to objects to represent the amount or kind of an attribute studied have been categorized as nominal, ordinal, interval, and ratio. These types of measurement scales are common in nursing. Measurements that result in nominal-scale data place attributes into defined categories according to a specified property. Numbers assigned to nominal-level data have no hierarchical meaning but represent an object's membership in one of a set of mutually exclusive, exhaustive, and unorderable categories. For example, categorizing persons in a study as either female or male is measurement on the nominal measurement scale.

In ordinal-scale measurement, rules are used to assign rank order on a particular attribute that characterizes a person, object, or event. Ordinal-scale measurement may be regarded as the rank ordering of objects into hierarchical quantitative categories according to relative amounts of the attribute studied. The categorization of heart murmurs in grades from 1 through 6 is an example. In this ordinal measure, a Grade 1 murmur is less intense than a Grade 2, a Grade 2 less intense than a Grade 3, and so forth. The rankings in ordinal-level measurement merely mean that the ranking of 1 (for first) has ranked higher than 2 (for second) and so on. Rankings do not imply that the categories are equally spaced nor that the intervals between rank categories are equal.

Interval-scale measurement is a form of continuous measurement and implies equal numerical distances between adjacent scores that represent equal amounts with respect to the attribute that is the focus of measurement. Therefore, numbers assigned in interval-scale measurement represent an attribute's placement in one of a set of mutually exclusive, exhaustive categories that can be ordered and are equally spaced in terms of the magnitude of the attribute under consideration. However, the absolute amount of the attribute is not known for a particular object because the zero point is arbitrary in an interval scale. The measurement of temperature is a good example of an interval-level measure because there is no true zero point. For example, the zero point is different based on whether the Fahrenheit or Centigrade measurement approach is used, and one cannot say that an object with a temperature of 0°F or 0°C has no temperature at all. Ratio-level measures provide the same information as interval-level measures; in addition, they have absolute zero points for which zero actually represent absence of the attribute under study. Volume, length, and weight are commonly measured by ratio scales.

There is controversy about the level of measurement scales and the type of statistical procedures that may be appropriately used for data analysis. There are researchers and statisticians who believe that only nonparametric statistical procedures can be used for data analysis when data are nominal or ordinal and that inferential statistics can be properly applied only with interval and ratio data. There is controversy about whether Likert scaling (which is often used in nursing with measures of attitude or opinion) is in actuality ordinal-level measurement for which only nonparametric statistics should be used. Likert scaling involves having subjects rank their responses to a set of items on a range of numbers, such as "1" to represent lack of agreement to "5" to represent complete agreement. It has been the accepted practice for investigators to use scores generated with Likert-type scales as interval-level data.

Nurses have typically borrowed many measures from other disciplines. This reflects the fact that nursing is a field that considers the biological and psychosocial aspects of care and is based on knowledge generated by many fields of inquiry. Therefore, many measures developed by other disciplines are consistent with nurses' measurement needs. However, the heavy dependence on borrowing measures from other disciplines reflects the trend in the 1970s for nurses to pursue doctoral education in related fields, such as education, psychology, sociology, and physiology. Nurses became familiar with measures from other fields during their graduate studies and were encouraged to use them in the nursing context.

By the mid-1970s, nurses became more cognizant of some of the limitations in borrowing certain measures and instruments from other disciplines. For example, it is not unusual for instruments developed to measure psychosocial variables in other fields to be cumbersome and inefficient for use in the clinical settings of nurse researchers. Often the instruments developed in other fields were not sensitive to clinically relevant attributes of concern to nurses in populations such as children, frail patients, the elderly, and the culturally diverse.

The movement in nursing to develop more rigor in the use and development of measurement instruments gained prominence in the 1970s. In June 1974, a contract was awarded to the Western Interstate Commission for Higher Education by the Division of Nursing, Bureau of Health Manpower, and Health Resources Administration to prepare a compilation of nursing research instruments and other measuring devices for publication. With Doris Bloch as project officer, a two-volume compilation of instruments, titled *Instruments for Measuring Nursing Practice and Other Health Care Variables*, was published in 1978 (Ward & Lindeman, 1978). Priority was placed on compiling instruments dealing with nursing practice and with patient variables rather than nurse variables. This was an important milestone for nursing measurement because it was the first effort that placed a large number of clinically focused instruments developed or used by nurses in the public domain.

During the late 1970s and early 1980s, nurse scientists began to focus their work on developing measurement as an area of special emphasis in nursing. At the University of Arizona–Tucson, Ada Sue Hinshaw and Jan Atwood focused their efforts on refining and further developing instruments for clinical settings and for clinically focused research. The first postdoctoral program in nursing instrumentation and measurement evolved at the University of Arizona, and annual national conferences on nursing measurement were offered. Ora Strickland and Caroyln Waltz at the University of Maryland at Baltimore focused on defining measurement principles and practices to build rigor in nursing research. Careful assessments of nursing research published in professional journals revealed that nurse investigators were not giving adequate attention to reliability and validity issues when selecting and developing instruments. Nurse investigators tended to rely too heavily on paper-and-pencil self-report measures and did not give adequate attention to selecting biological measures as indicated by the conceptual frameworks of the studies (Strickland & Waltz, 1986). The Maryland group published the first measurement textbook for nurses, *Measurement in Nursing Research* (Waltz, Strickland, & Lenz 1984), and implemented a measurement project funded by the Division of Nursing of the Department of Health and Human Services. This project prepared more than 200 nurse researchers to develop and test instruments for use in nursing and resulted in the initiation of a series of books, *Measurement of Nursing Outcomes*, which compiled instruments developed for the nursing context.

In 1993, Ora Strickland initiated and edited the *Journal of Nursing Measurement* with Ada Sue Hinshaw as coeditor. This journal brought nursing measurement to a new level of focus, responding to the need for continuing development and dissemination of nursing measurement instruments and providing an identifiable forum for the presentation and discussion of measurement concerns in nursing.

As nursing moved into the twenty-first century, the development of nursing measures continued to evolve with a focus on documenting patient care outcomes through empirical assessment with well-designed clinically validated outcome measures. Under the leadership of Meridean Maas at the University of Iowa, the National Institute of Nursing Research funded the Nursing Outcome Classification (NOC) Study. NOC was implemented as a natural outgrowth of the North American Nursing Diagnoses Association's movement, which emphasized the careful classification and documentation of nursing diagnoses, and the Nursing Intervention Classification, which focused on the specification of nursing interventions to address the identified nursing diagnoses. The NOC Study was particularly important for the advancement of nursing measurement because it took on the challenge of developing measures that could empirically document outcomes of nursing care.

The nursing profession has developed nursing measurement to a great degree over the past four decades. Nurses have developed and tested instruments for use in a variety of settings, created many new instruments, and further developed measures designed in other disciplines for use in nursing. Although greater focus has been placed on assessing and reporting reliability, precision, accuracy, and validity of measures in clinical settings and nursing research, inadequate attention has focused on the metric qualities of laboratory physiological measures and on quality control procedures for the enhancement of clinical measurements. There is still inadequate attention given to "the specification of the conceptual base of measurement tools, and, a heavy reliance on the use of self-report data, attitudinal and perceptual measures, and the use of questionnaires and rating scales" (Strickland, DiIorio, Coverson, & Nelson, 2007). Measures frequently have not been validated for or are not available for minority and low socioeconomic populations, children, frail patients, and those with limited verbal communication. Long and cumbersome instruments that are difficult for clinical populations to understand and complete validity remain an issue. The increasing number of immigrants in the general population has brought the need to validly translate and use existing instruments with a diverse population to the forefront as nursing measurement issue. Nursing studies of families, communities, and organizations and systems have been hampered by the lack of effective measures to address group and system variables from the nursing perspective (Strickland, 1995).

Ora Lea Strickland

MENOPAUSE

Menopause is the final menstrual period, said to have occurred after a woman has not had menses for at least 1 year. Nurse researchers have developed an approach using a menstrual calendar to determine women's progress through the menopausal transition (Mitchell, Woods, & Mariella, 2000), which has been influential in stimulating a Staging Reproductive Aging Workshop sponsored by the National Institutes of Health. The staging criteria have been subsequently validated by a multi-investigator international collaborative in the ReSTAGE Study (Harlow et al., 2007). For women who have had regular cycles, the time before the onset of persistent menstrual irregularity during midlife is labeled the late reproductive stage. The early menopausal transition stage is defined as persistent irregularity of more than 6 days absolute difference between any two consecutive menstrual cycles during the calendar year, with no skipped periods, and late transition stage is defined as persistent skipping of one or more menstrual periods (having double the modal cycle length or more for the calendar year). In the absence of a modal cycle length, a population-based cycle length of 29 days was used. Persistence meant the event, irregular cycle or skipped period, occurred one or more times in the subsequent 12 months. The time following the final menses is postmenopause.

Nursing scholars have contributed to the field of menopause research in many ways, including (1) development of holistic frameworks for understanding women's experiences of menopause; (2) understanding of the normative experience of menopause, including an approach to staging progress through the menopausal transition described above and the chronology of symptom experiences across the menopausal transition and postmenopause; (3) comparative approaches to measurement of symptoms; (4) identification of factors associated with symptom severity during the menopausal transition, including biomarkers related to glucose metabolism; (5) experiences of menopause among populations of women with special health problems; (6) nonpharmacological approaches to symptom management; and (7) relationship of the menopausal transition to healthy aging.

Holistic frameworks for understanding women's experience of menopause have permeated nursing research contributions, in particular in studies focused on symptoms. Among the constructs that organize investigation of symptoms during the menopausal transition and early postmenopause are age and age-related factors, menopause-related factors including hormone levels and patterns across the menopausal transition stages, perceived stress, social factors, health-related factors such as perceived health, and health-related behaviors and symptoms that co-occur. Reference to nursing and related theory about symptoms has enriched understanding of the menopausal transition experiences (Lenz, Pugh, Milligan, Gift, & Suppe, 1997). For example, results from analyses using these frameworks reveal that perceived stress is not related directly to the menopausal transition or endocrine changes, but perceived stress is related to experiencing more severe symptoms (Woods, Mitchell, Percival, & Smith-DiJulio, 2009).

Staging the menopausal transition has enabled investigators to determine the sequence of events taking place as women progress through the early and late menopausal transition period and experience the early postmenopause. In the Seattle Midlife Women's Health Study, a longitudinal study of the natural history of the menopausal transition, use of the menopausal transition staging system allowed identification of predictable stages related to endocrine changes (follicle-stimulating hormone and estrogen) and symptoms such as hot flashes, depressed mood, and nighttime awakening, which are most severe during the late menopausal transition stage (Smith-DiJulio, Percival, Woods, Tao, & Mitchell, 2007; Woods & Mitchell, 2010; Woods et al., 2008). The chronology of symptoms has been tracked using health diaries and repeated measures of symptoms over the course of the menopausal transition for as long as 20 years (Woods et al., 2007).

In addition, the staging system has been useful in discerning when changes in lipid levels and metabolic markers related to healthy aging (Lee et al., 2009).

Factors associated with symptom severity span biological, behavioral, social, and cultural. Biological hypotheses accounting for hot flashes have addressed glucose metabolism (Dormire & Bongiovanni, 2008; Dormire & Howharn, 2007), serotonin (Carpenter et al., 2009), and gene polymorphisms influencing estrogen synthesis, metabolism, and receptors (Woods et al., 2006).

Menopause among special populations of women has attracted the interest of nurse scientists, as exemplified by Carpenter's work focusing on women with breast cancer who experience induced menopause. This body of work has contributed not only to understanding utility of hot flash monitors to assess skin temperature but also use of increasingly more sophisticated approaches to understanding symptoms (Carpenter, Monaham, & Azzouzz, 2004). Carpenter (2001) developed the Hot Flash Daily Symptom Interference Scale to further understand the degree to which hot flashes interfered with multiple dimensions of life, including work, social, leisure, sleep, mood, concentration, relationships, sexuality, and enjoyment as well as asking women to describe the extent to which they were bothered by their symptoms.

Following publication of the results of the Women's Health Initiative Trial, women exhibited increased interest in nonhormonal therapies for symptoms related to menopause. Given the recommendation to women who experienced breast cancer to avoid using hormone therapy, the field of nonpharmacological approaches to managing menopause symptoms has also been enriched by contributions of nurse investigators whose work focused on women with breast cancer or other contraindications to estrogen use. This work is exemplified by Carpenter's clinical trial demonstrating the efficacy of on paced respiration for reduction of hot flash bother and interference (Carpenter, Neal, Kimmick, & Sotrniolo, 2007) as well as Cohen's research on acupuncture for hot flashes (Cohen, Roussouw, & Carey, 2003).

Healthy aging is increasingly understood in relation to a life span view of health. This perspective is beginning to permeate the understanding of menopause and its effects on future health. Although most biomedical researchers have emphasized the consequences of menopause and hormone changes on osteoporosis, cardiovascular disease, diabetes, and more recently metabolic syndrome, nurse researchers have emphasized health promotion and prevention strategies that may also alleviate symptoms, such as use of health education and cognitive-behavioral therapy interventions.

Although contributions to symptom management from nurse investigators are beginning to influence the field of menopause care, trials examining nonpharmacological agents compared with standard care protocols are needed. Given the pressing need for evidence to guide primary care interventions, new models of therapeutics should be tested in these settings. Tailoring therapies to women from diverse ethnic backgrounds will require collaboration between investigators trained to conduct clinical trials and those schooled in culturally appropriate strategies for the delivery of care. In addition, health education about menopause delivered in primary care and community settings should be examined for effects on women's uncertainty about what to expect during the menopausal transition and postmenopause.

Although nursing research on symptom clusters is commonplace in the oncology specialty, identification of symptom clusters is just beginning in studies of menopause (Cray Woods, & Mitchell, 2010). Growing evidence that women experience clusters of symptoms, not only hot flashes, during the menopausal transition and early postmenopause, warrants more careful examination of both factors related to different symptom clusters and differential treatment effects of pharmacological and nonpharmacological therapies on clusters of symptoms to enhance the precision of therapeutic effectiveness. Involvement of several nurses as investigators (Carpenter, Landis, Woods, Newton, and La Croix) for the newly National Institutes of Health–funded Menopause Symptoms: Finding lasting Answers for Symptoms and Health (MS-FLASH) multisite trials of therapies for menopause-related symptoms promises to yield opportunity to further these efforts.

Diana Taylor
Nancy Fugate Woods

MENTAL HEALTH IN PUBLIC SECTOR PRIMARY CARE

Primary care was first comprehensively defined by the World Health Assembly in the late 1970s following a seminal conference in Alma-Ata in 1977 (World Health Assembly, 1978). Building upon the key aspects of Alma-Ata, the 1978 World Health Organization definition of primary care emphasized its defining aspects as essential, first-level health care embedded in the community, available to all, evidence based, socially acceptable, and affordable. In the United States, this optimistic vision for high-quality primary care has been only partially achieved. Ongoing challenges to high-quality primary care services are especially pronounced for public sector primary care. Public sector primary care services serve disproportionate of numbers health care users who have limited ability to pay for health services and experience significant health disparities. Both economic barriers to care and health disparities—including inequalities in mental health care related to race and ethnicity—are key priorities for research on improving health services (Institute of Medicine, 2003d; Primm et al., 2010; U.S. Department of Health and Human Services, 2001). These issues cut across all areas of public health need, including mental health services.

Also in the late 1970s, the primary care setting became formally recognized as the *de facto* mental health services system in the United States (Regier, Goldberg, & Taube, 1978). Of the minority of individuals who receive needed mental health services, most receive their services in primary care instead of the mental health specialty sector. Many people seen in primary care for medical problems have clinically significant comorbid mental health conditions (Miranda, Hohmann, Attkisson, & Larson, 1994), especially anxiety, depression, and substance misuse disorders. People with severe forms of co-occurring disorders that include severe mental illness and chronic physical illnesses have been found to die up to 25 years earlier on average compared with the general population, and this health disparity has increased over time in context of inadequate health care service models for this population (Morden, Mistler, Weeks, & Bartels, 2009). The burden of unmet mental health needs remains high for racial and ethnic minorities compared with Whites (U.S. Department of Health and Human Services, 2001; U.S. Public Health Service Office of the Surgeon General, 1999). Although the past decade has seen some improvements, there continue to be significant barriers exist to accessing public sector health services, including the affordability of care, social stigma associated with mental illness, and fragmented care delivery systems acting as barriers to care when care is sought (U.S. Department of Health and Human Services, 2001; Villena & Chesla, 2010). These issues continue to be most pronounced for populations which experience the greatest health disparities, including those with severe forms of co-occurring physical and mental disorders (Committee on Crossing the Quality Chasm, 2006; U.S. Department of Health and Human Services, 2001).

A central goal of contemporary mental health services research is to generate new knowledge directed to the transformation of mental health services to achieve high-quality, accessible, recovery-oriented care for all (The President's New Freedom Commission on Mental Health, 2003). In recent decades, tests of interventions for primary care mental health care have evolved from primarily efficacy assessments to effectiveness assessments, with the most recent emphasis on research to foster implementation of effective interventions and service delivery models to alter usual care (Chambers, 2008; Mental Health America, 2010). As primary care research continues to evolve to better address issues of health disparities and mental health care delivery models for primary care settings, there are key opportunities for nurse researchers in context of health care reform legislation. The Patient Protection and Affordable Care Act (HR 3590) will expand health care coverage, including building the infrastructure for colocated integrated physical and mental health care delivered by community health teams (Hanrahan et al., 2003; National Alliance on Mental Illness, 2010; Sundarandam, 2009). The health care reforms also are projected to increase research that is focused on Medicare/Medicaid patients and their service utilization, such as provider and treatment approaches, and optimized payment options. Mental health research is now situated within the top tiers of priorities for comparative effectiveness health care research (Institute of Medicine, 2009a). Related reform legislation such as the Melanie Blocker Stokes Postpartum Depression Act (Section 2942) has direct relevance to primary care research in terms of interventions to reduce the rates of undiagnosed and untreated postpartum depression (National Alliance on Mental Illness, 2010).

Nurse researchers have the potential to make significant contributions to services and interventions research for a redesigned primary care mental health services in two specific areas. The first area concerns testing interventions and models of care with well-documented effectiveness for common mental health issues within the primary care and other community-based settings where people obtain health care services, but these are tailored in innovative ways to be acceptable for various high-need patients populations and which can be shown to be both effective and cost-effective in nontraditional settings of care. Consistent with the literature in medicine and other fields, the nursing literature on managing mental health issues in primary care and community-based settings has grown over the past two decades. However, there are still relatively few tests of nursing interventions using advanced practice nurses (such as nurse practitioners and mental health clinical nurse specialists) to manage mental health issues in "usual care" primary care and community-based settings. This is especially so for public sector primary care with populations that are most underserved and which experience health disparities. Some recent examples of research with underserved populations include testing a nursing intervention for managing major depression in rural women (Hauenstein, 1996), participation of urban nurse-managed center in a depression collaborative to improve care for depression (Torrisi & McDanel, 2003), testing the effect of a motivational group intervention on exercise self-efficacy and outcome expectations for exercise in community-dwelling adults with schizophrenia spectrum disorders (Beebe et al., 2010), and testing an in-home intervention to reduce depressive symptoms among Latina mothers of infants and toddlers enrolled in Early Head Start programs (Beeber et al., 2010). Within these types of nursing intervention studies, there is a well-matched opportunity to include aspects that foster high-level recovery of people who are living with mental health conditions (Camann, 2010).

The second area of research opportunity concerns evaluations of now rapidly evolving integrated health care roles for advanced practice nursing, in which medical and mental health skills are available in the same geographic location and primary care provider (Delaney, 2009, 2010; National Panel for Psychiatric-Mental Health NP Competencies, 2003). Although integrated care models for management of physical and mental disorders are not yet universally available, there is a key role for advanced practice nurses who effectively blend medical and mental health training and well positioned to manage the holistic needs of the patients they see in primary care settings (Hogan & Shattell, 2007; Manderscheid, Masi, Rossignol, & Masi, 2007). This is an especially critical need for populations in which there are complex co-occurring physical and mental health disorders that are associated with substantial morbidity, premature mortality, and diminished quality of life (Weber, Cowan, Millikan, & Niebuhr, 2009) and addresses the Institute of Medicine recommendation to integrate mental health and substance abuse care within primary care services (Committee on Crossing the Quality Chasm: Adaptation to Mental Health and Addictive Disorders, 2006). There are some models of integrated nursing care for co-occurring disorders that have been developed and tested within the past decade. For example, Lyles et al. (2003) reported the results of an intervention that used nurse practitioners trained to manage the medical and mental health needs of primary care patients with medically unexplained symptoms. McDevitt, Braun, Noyes, Snyder, and Marion (2005) described the evaluation of a nurse-managed integrated primary and mental health care center for persons with serious and persistent mental illness. These types of integrated roles need additional research testing for various combinations of comorbid health conditions that are most commonly managed in primary care and community-based settings.

Celia E. Wills
Anna L.D. Villena

MENTAL HEALTH SERVICES RESEARCH

Mental health services research (MHSR) is a subset of health services research that focuses mental disorders across the life span in diverse populations in terms of the organization and delivery of services, outcomes and quality of care, clinical epidemiology, and evidence-based practice dissemination and implementation (National Institute of Mental Health, 2010). The importance of MHSR to inform improvements to public health services has become increasing recognized in recent years, especially as mental disorders are documented to be a leading and increasing cause of disability in the United States and worldwide (U.S. Public Health Service Office of the Surgeon General, 1999; World Health Organization, 2008). MHSR generates new knowledge directed to the transformation of mental health services to achieve high-quality, accessible, recovery-oriented care for all (The President's New Freedom Commission on Mental Health, 2003). In MHSR, the methods used to study general health services research are applied to examine a diverse range of topics such as reducing the morbidity and mortality of suicidality in at risk populations, research on effective approaches to improving the dissemination and uptake of evidence-based practices, research on mental health care delivery in traditional and nontraditional service settings, economics and financing of mental health services, and identification of innovations in mental health service delivery models to address unmet mental health care needs (National Institute of Mental Health, 2010).

MHSR is interdisciplinary and integrates the expertise of researchers in diverse fields, including such as psychiatric-mental health nursing, psychology, psychiatry, social work, anthropology, sociology, economics, biostatistics, health administration, and public policy. Broad interdisciplinary research expertise is needed for the diverse range of health services research topics that require the integration of literature from multiple fields, construction of complex research designs and data collection protocols, use of sophisticated approaches to data analysis, and designing effective approaches to dissemination and implementation of research results. Research funding for MHSR is supported by multiple sources, including local, state, and federal. At the federal level, MHSR is especially supported by the NIMH Division of Services and Intervention Research. Most federally funded, academically based research centers for MHSR are led by nonnurse researchers. An exception is the Southeastern Rural Mental Health Research Center at the University of Virginia, School of Nursing, which began in 1992 supported by NIMH funding and continues its focus on unmet mental health needs among poor and minority populations in rural settings (Southeastern Rural Mental Health Research Center, 2008).

Distinctions between interventions (treatment) and services research are somewhat indistinct. Interventions research focuses on efficacy and effectiveness of discrete therapeutic interventions, whereas services research focuses on the organization and delivery of health care. Nurse researchers have most often focused on testing mental health interventions research as opposed to conducting broader service systems research. MHSR programs led by nurses remain uncommon; in part, this scarcity reflects the small number of nurses specializing in psychiatric nursing (Hanrahan et al., 2003; Hanrahan, 2009) as well as limited numbers of nurses with doctoral and postdoctoral training in MHSR. The current supply of mental health services researchers remains low in relation to present and projected future needs. There remains a continuing need to increase the supply of nurses with doctoral level training and funded research programs to improve the contributions of nursing to MHSR.

Results of MHSR appear in journals publishing MHSR, such as the *Archives of Psychiatric Nursing*, *Issues in Mental Health Nursing*, *Journal of the American Psychiatric Nurses Association*, *Journal of Psychosocial Nursing and Mental Health Services*, *Administration and Policy in Mental Health and Mental Health Services Research*, and *Psychiatric Services* as well as many other journals not specifically focused on mental health or health services research. A review of literature from mental health nursing journals leads to a conclusion that quality outcomes and mental health delivery systems are among mental health nursing research priorities (Pullen, Tuck, & Wallace, 1999). Fifteen years ago, a review of nursing literature from 1989 to 1994 concluded that few psychiatric nursing studies were published in major nursing journals and that there was a lack of programmatic research upon which to base rigorous evaluation of outcomes (Merwin & Mauck, 1995). An updated review of current nursing literature done for this chapter obtained results that remained consistent with these earlier conclusions. Relatively few nurse researchers conduct MHSR. Some representative examples of MHSR conducted by nurse researchers over the past decade include research on outcomes and satisfaction of patients of psychiatric clinical nurse specialists (Baradell & Bordeaux, 2001), shortages of rural mental health professionals (Merwin, Hinton, Dembling, & Stern, 2003), and identification of mental health treatment disparities in rural minority groups based on analysis of the Medical Expenditure Panel Survey data (Petterson, Williams, Hauenstein, Rovnyak, & Merwin, 2009).

An emerging and significant area of MHSR that nurse researchers have begun to address is the integrated mental and physical health care for persons with severe co-occurring mental and physical disorders. Traditionally, research in this area has been conducted by other types of health care researchers such as psychiatrists, psychologists, social workers and physicians, and often not in community health care settings. There are some nursing research programs within academic centers, such as the University of Illinois–Chicago Nursing Integrated Health Care (IHC) Center that researches best practices for systems of integrated care (McDevitt, Braun, Noyes, Snyder, & Marion, 2005; University of Illinois–Chicago College of Nursing, 2010). Internationally, some nurse researcher teams have partnered with community health centers to study the impact of integrated care (Smith & Ross, 2007). These nursing community collaborative initiatives show promise for improving health care services for people with severe co-occurring mental and physical disorders and are a priority for continued nursing research.

Celia E. Wills
Anna L.D. Villena

MENTAL STATUS MEASUREMENT: MINI-MENTAL STATE EXAMINATION

Recognizing cognitive impairment is important for establishing patients' capacity to make (or not) independent health care decisions to be active participants in their care and for providing individualized quality care. It is especially important to know the cognitive status of older adults because by the mere fact of aging they are at risk for developing Alzheimer's disease, could have undetected mild cognitive impairment (MCI), or cognitive deficits secondary to other disease processes. The Mini-Mental State Examination (MMSE; Folstein, Folstein, & McHugh, 1975) is a brief clinical assessment appropriate for use in a variety of settings for cognitive screening of older adults. Up to 75% of cases of dementia or probable dementia are not identified by primary care physicians, most likely because of the brief time available for an office visit (Holsinger, Deveau, Boustani, & Williams, 2010). A 5- to 10-minute baseline assessment of cognitive status using the MMSE would allow for early diagnosis of neurodegenerative disorders such as Alzheimer's disease, identification of cognitive impairment secondary to a stroke or diseases such as Parkinson disease, or detection of cognitive impairment caused by medication side effects.

The MMSE was constructed more than 35 years ago to conduct serial cognitive testing of patients on a neurogeriatric ward. The MMSE has been translated into more than 50 languages (Dean, Feldman, & Morton, 2009), is the most widely used cognitive assessment scale (Holsinger et al., 2010), and was cited by 7000 articles in the OVID Medline database from 1986 to August 2010. The MMSE was developed to be a brief and easy to administer clinical evaluation tool. Scores range from all correct (30) to no correct (0) responses. Scores of 26–29 indicate questionable dementia, 21–25 mild dementia, 11–20 moderate, and 0–10 severe dementia (Perneczky et al., 2006).

Six categories of cognitive tasks comprise the MMSE: (1) orientation determined by responses to five questions each about time and place (10 points); (2) registration assessed by ability to learn the names of three unrelated objects (3 points); (3) attention and calculation tested by either performing serial sevens or spelling the word "world" backwards (5 points); (4) recall evaluated by naming the three objects previously learned (3 points); (5) language assessed by six items of naming two objects, repeating a statement, following a three-stage verbal command, reading and following a written command, and writing a sentence spontaneously (8 points); and (6) visual–spatial capacity by copying two intersecting pentagons (1 point).

To administer the MMSE, a one-page sheet with items/instructions and space for writing scores is used. The MMSE is not a timed test but usually takes 5 to 10 minutes. The tester asks the patient to respond to each item and records individual scores. Item scores are summed to provide the final score and a calculator is not needed. The MMSE is a copyrighted scale, and the Mini-Mental LLC of Massachusetts offers forms, guides, and software through Psychological Assessment Resources of Florida for approximately $1 per test (Powsner & Powsner, 2005).

Before conducting an MMSE assessment, the nurse or other tester should make the patient comfortable and establish rapport. During the testing, praising success and not pressing on items the patient finds difficult should enhance cooperation. The testing situation may be embarrassing for patients who are aware that they are “missing” some items and the nurse needs to protect the self-esteem of such patients while preserving the integrity of the testing procedures. As with any scale, the degree to which the MMSE is reliable and valid is critical. The tester needs to follow the administration procedures exactly and clinicians/researchers need to interpret the meaning of scores properly.

Psychometric assessment of the MMSE has been conducted. Reliability and validity estimates of the MMSE were satisfactory for a screening tool (Folstein et al., 1975). Initial reliability, accuracy by measuring consistency in the items and different raters, was adequate for interrater agreement and retest stability when two samples of patients and several test administrators were compared. Validity, the degree to which the MMSE measures the construct of cognitive impairment, was supported by convergent and discriminant validity comparing hypothesized similarities/differences between scores from three groups of normal, demented, and depressed subjects with and without cognitive symptoms.

The MMSE is the most studied of all cognitive tests (Holsinger et al., 2010). Additional cognitive tests have been developed and compared with the MMSE across conditions, and those empirical data have supported the sensitivity and specificity of the MMSE as a cognitive screening scale. Sensitivity, the percentage of people who test positive (number of true positives divided by the number of true positives plus the number of false negatives), has ranged from 71% to 92% (Boustani et al., 2003). Specificity, the percentage of people who test negative (number of true-negatives divided by the number of true-negatives plus the number of false-positives) has ranged from 56% to 96% (Boustani et al., 2003). Therefore, the MMSE is expected to correctly identify persons with mild to moderate cognitive impairment approximately 80% of the time and not to incorrectly identify persons as having mild to moderate cognitive impairment when they do not approximately 75% of the time.

Variables other than cognitive status, most notably age and education, may influence test scores (Butler, Ashford, & Snowdon, 1996). Older persons and those with low education may score slightly lower yet have higher cognitive capacity so there are MMSE test norms based on these variables (Crum, Anthony, Bassett, & Folstein, 1993). Modifications have been made for culturally and linguistically appropriate MMSE versions (Folstein, 1998). An increased risk of false-positives has been found when using the MMSE with the culturally deaf population (Dean et al., 2009). Scores need to be interpreted differently for persons with visual or auditory deficits that preclude use of certain items that require sight or hearing or impact test performance.

After 35 years of use, an MMSE score of 23 points or less is generally considered to be *preliminary* evidence of cognitive impairment and *grounds for further evaluation* (Cockrell & Folstein, 1988). When patients score approximately 27 on the MMSE, scores of items testing long-term memory should be checked because failing only those items could be the first signal of MCI (Pasqualetti et al., 2002). MMSE scores should be considered with other assessment data and neuropsychological test to inform diagnoses and make treatment decisions, for example, a test for executive function (Kennedy & Smyth, 2008), because that is not measured by the MMSE.

There are specific clinical instances when the MMSE is not recommended for use at all, should be used as an adjunct with other assessments, or substituted with an assessment that is not copyrighted. The MMSE is not appropriate for assessing delirium, and the Confusion Assessment Method is recommended (Inouye et al., 1990). The MMSE has a "bottom" effect, meaning that once "0" is scored, the MMSE does not have the capacity to further quantify cognitive differences that exist between patients who score "0." Another scale, as the Bedford Alzheimer Nursing Subscale (BANS; Volicer, Hurley, Lathi, & Kowall, 1994), allows additional discrimination for persons who "bottom" on the MMSE. The National Institutes of Health Stroke Scale and the MMSE both detected severe cognitive impairment after a stroke (Cumming, Blomstrand, Bernhardt, & Linden, 2010). The Montreal Cognitive Assessment (Nasreddine et al., 2005) is suggested to detect MCI or dementia in persons with Parkinson disease, with the caveat that a positive screen using either the MMSE or the Montreal Cognitive Assessment requires additional assessment because of suboptimal specificity at the recommended screening cutoff point (Hoops et al., 2009). Overcoming the copyright (and thus cost) issue of the MMSE has been addressed (Smith, 2010) with suggestions that no-cost scales, for example, the Modified Mini-Mental State Examination (3MS) (Teng & Chui, 1987) that has been found to detect dementia (Bland & Newman, 2001) or the Saint Louis Mental Status Examination (Tariq, Tumosa, Chibnall, Perry, & Morley, 2006), be used.

In the research arena, the MMSE is used both as an enrollment criterion (cut score) and to characterize subjects' cognitive capacity. Because the MMSE is used in so many studies, it is almost incumbent on researchers to include the MMSE to provide consumers of research with a benchmark of cognitive capacity for comparing results across studies. For instance, the Cochrane Group conducted systematic reviews of statins and dementia. In prevention trials, cognition was measured at different times and with different scales, precluding their combination in a meta-analysis (McGuinness, Craig, Bullock, & Passmore, 2009). Treatment studies provided MMSE change scores from baseline, thus allowing comparisons across studies (McGuinness et al., 2010).

The MMSE remains a reasonable screening instrument for assessing and communicating mild-moderate cognitive impairment and for characterizing research subjects. Reliability checks need to be in place and testers should periodically be observed for accuracy. Testing needs of special populations should be addressed and validated test norms should be used. We agree with Holsinger et al. (2010) that clinicians should consider one primary tool that is population appropriate and add others for special situations as needed.

Ann C. Hurley
Ladislov Volicer
Ellen K. Mahoney

MENTORING

Mentor relationships are being recognized as an essential component in the career development of every professional nurse. The value of these developmental and support relationships for people in life and work has been documented through anecdotal and research studies (Allen, Eby, Poteet, Lentz, & Lima, 2004; Ensher & Murphy, 2005; Kram, 1988; Noe, Greenberger, & Wang, 2002; Wanberg, Welsh, & Hezlett, 2003; Zey, 1984). In particular, the complexity of a nursing career requires a substantial mentoring network to develop expertise and safe performance, to ensure professional and personal success and satisfaction, and to promote leadership development (Benner, 1984; Benner, Tanner, & Chesla, 1996; Chandler, 1992; Johnson, Cohen, & Hull, 1994). For example, the presence of mentor relationships was identified as an important factor in the socialization and development of expertise in critical care nurses (Pyles & Stern, 1983). Mentor collegial partnerships are necessary for students and professional nurse to learn and refine the nursing discipline as they provide clinical care, learn and teach, perform research and scholarship, and lead the profession (Grossman, 2007; Fawcett, 2002; Olson & Vance, 1993, 1998; Stewart & Kreuger, 1996; Vance, 1997; Vance & Olson, 1998).

The word "mentor" was introduced in the literature thousands of years ago in Homer's (1967) *The Odyssey*. According to this legend, Mentor in the disguise of Athena, the Goddess of Wisdom, was appointed to serve as guardian, teacher, advocate, and adviser to the son of King Odysseus while he was fighting the Trojan War for 10 years. Mentoring has traditionally been defined as a teaching and support relationship between an older, wiser, more experienced person who guides a younger and/or less experienced person (i.e., protégé) during an extended period of time (Johnson & Ridley, 2004). This is an expert-to-novice model of mentoring, in which the mentor was usually male and at least 8 to 10 years older than the protégé. More recently, the mentor connection in nursing has been described as a "developmental, empowering, nurturing relationship extending over time, in which mutual sharing, learning, and growth occur in an atmosphere of respect, collegiality, and affirmation" (Vance & Olson, 1998). This contemporary definition is more inclusive and diverse, with no restrictions of gender, age, education, experience, education, and racial-ethnic background. This mentoring can be an expert-to-novice model or peer-to-peer model in which mentors can include colleagues, bosses, teachers, friends, and families. The mentor relationship should be characterized by reciprocity, as all participants can both give and receive the benefits of mentoring. "This relationship can be an expansive resource of growth, empowerment, and opportunity for both mentors and proteges" (Vance, 2011).

Although nurses have undoubtedly mentored each other since the beginning of modern-day nursing, the phenomenon throughout the profession is relatively new. The first documented study of mentor relationships in the nursing profession was conducted by Vance (1977, 1982) with a population of nationally identified "nurse influentials." Until that time, the word "mentor" was not widely acknowledged in the nursing literature, nursing research, clinical workplace, nursing programs, and professional associations. Nurses, who are predominantly women, along with women in every field did not historically experience the advantages of being part of mentor networks until relatively recent. Traditional mentoring was viewed as a male phenomenon in the older professions and in the business world (Collins, 1983; Jeruchim & Shapiro, 1992).

Two types of support are provided in mentoring relationships: expert and peer-collegial. The expert mentor is someone with advanced education, knowledge, and experience who provides assistance to protégés through (1) career-focused activities (i.e., guidance, coaching, networking, teaching, feedback, and role modeling) and (2) psychosocial activities (i.e., support, advocacy, inspiration, empowering, and counseling). The peer mentor is a colleague who can provide similar types of mentoring assistance and is a more equalitarian relationship because of similarity of age, experience, and education. Both expert and peer-collegial mentors are important as they offer different perspectives and assistance. Having several different types of mentors at different career stages is recommended for the complexity of the nursing career.

All levels of nurses may benefit from both individual and collective mentoring. Individual mentoring occurs when mentors and protégés choose each other through mutual attraction, common interests and goals, and mutual admiration and trust. This relationship can be expert to novice as well as peer to peer. Collective mentoring occurs in a formalized program in which mentors and protégés are "matched" or "assigned" to each other to accommodate special goals and needs. Formal mentor programs are often part of orientation programs for novices or newly hired nurses in clinical settings, in schools of nursing for students and/or faculty, and as special programs for members of professional or specialty nursing associations. Establishing a culture of mentoring in organizations and professions unleashes human potential, talent, and achievement and provides multiple benefits to the individual, the workplace, and the profession (Vance, 2011).

The positive outcomes of mentoring in educational settings, clinical workplace, professional associations, and scholarship and research activities are being documented in extensive anecdotal and research-based literature. The necessity and value of mentor connections for the leadership development of nurses throughout the entire career spectrum is becoming well established in the profession.

The educational milieu is a prime site for mentorship. Mentoring is a relational phenomenon and is therefore a natural component of teaching and learning. Students at all levels, junior and senior faculty, and academic administrators benefit from mentoring relationships. Olson and Vance (1998) and Vance and Olson (1998) reviewed research studies in nursing education that demonstrated mentorship as being a key process in facilitating academic success and retention, scholarly productivity, clinical excellence, and leadership development. Increasingly, nursing education programs are establishing formal mentor programs among students, faculty, and alumni to foster learning, scholarship, and development of academic careers. Ongoing studies continue to document the value of mentoring for nursing students and faculty.

Formal mentoring programs within clinical environments contribute to a supportive professional practice environment and are particularly valuable for the novice nurse. The mentored novice nurse is socialized into the professional role and supported in the development of clinical competence, safe patient care, self-confidence, work satisfaction, and professional commitment (Barton, Gowdy, & Hawthorne, 2005; Pelico, Brewer, & Kovner, 2009; Roberts, Jones, & Lynn, 2004). Nelson, Godfrey, and Purdy (2004) found that novice nurses in mentor programs gained skills in the nursing process, gained critical thinking skills, and had a greater understanding of the organizational culture. For experienced nurses, mentoring provides ongoing support, clinical development and expertise, expanded career opportunities, and leadership development (Johnson et al., 1994; Reeves, 2004; Schoessler & Farish, 2007; Vance & Larson, 2002). One study found that relationships with peers, mentors, and patients were directly instrumental in nurses' ability to perform at higher levels of expertise and leadership (Roche, Morsi, & Chandler, 2009). Recruitment and retention in the clinical workplace are also enhanced through formal mentor programs and the establishment of a mentoring culture (Butler & Felts, 2006; Funderburk, 2008; Greene & Puetzer, 2002; Olson et al., 2001; Vance, 2007). Mentorship is also closely linked to the establishment of respectful collegial and mentor relationships that empower and support nurses' clinical excellence (Laschinger, Finegan, & Wilk, 2009;

Thomas & Burk, 2009). The presence of disruptive behaviors in the clinical workplace, including intimidation, lateral violence, and workplace incivility, has been widely documented. These behaviors have been linked to various factors such as medical and nursing errors, communication problems, high cost of care, and job dissatisfaction. The American Nurses Association (2004) has adopted a *Leadership Standard*, which states that nurses should teach others to succeed by mentoring and other strategies.

Numerous professional nursing associations have assumed leadership in promoting mentor connections among their members for networking, information, education, and leadership training. Special interest and general professional and clinical specialty associations are providing both informal and formal mentoring opportunities for their members. They are reporting anecdotal reports of mentoring and networking benefits in their publications and Web sites.

Mentoring is a vital component of nursing scholarship and research activities (Byrne, Kangas, & Warren, 1996; Fawcett & McCorkle, 1998; Olson & Connelly, 1995; Rempusheski, 1992). One study reported that the most productive (i.e., eight or more research articles in a 3-year period) faculty members were more likely to have coauthored papers with mentors while in graduate school (Megel, Langston, & Cresswell, 1988). Mentoring for scholarship and research is occurring through university research programs, regional nursing research associations, private foundations, and the National Institute of Nursing Research.

In conclusion, an explosion of research studies and anecdotal reports in nursing over the past 20 years is providing important knowledge about the positive mentoring outcomes for the nursing profession. Through ongoing investigation, mentoring has been identified as an essential human and professional developmental relationship that empowers and develops students, novice and experienced nurses, and leaders and contributes to excellence and leadership in the profession. Research recommendations include study of peer mentoring outcomes, identification of different forms of mentoring to meet specific learning needs, outcome measures related to research and scholarly productivity through mentoring, qualitative and phenomenological methods of mentoring dyads, and mentoring outcomes for the novice nurse.

Connie Vance

META-ANALYSIS

Meta-analysis is a quantitative approach that permits the synthesis and integration of results from multiple individual studies focused on a specific research question. A meta-analysis is a rigorous alternative to the traditional narrative review of the literature. It involves the application of the research process to a collection of studies in a specific area. The individual studies are considered the sample. The findings from each study are transformed into a common statistic called an effect size. An effect size is a measure of the magnitude of the experimental effect on outcome variables.

Once the results from each study have been converted to a common metric, these findings can be pooled together and synthesized. The most common effect size indicator is r, which is the Pearson product moment correlation. Another effect size indicator is the d index. Cohen's d is the difference between the means of the experimental and control groups divided by the standard deviation. Cohen (1988) has provided guidelines for interpreting the magnitude of both the r and d effect size indicators. For the r index, Cohen has defined small, medium, and large effect sizes as .10, .30, and .50 or more, respectively. For the d indicator, an effect size of .2 is considered small, .5 is medium, and .8 or more is large.

Approaches are available to examine and reduce bias from operating within a meta-analysis. Some ways that biased conclusions can occur in a meta-analysis are effects of a bias toward publishing positive but not negative results, giving each study an equal weight in the meta-analysis despite the fact they differ in sample size or quality, inclusion of multiple tests of a hypothesis from an individual study, and not ensuring an acceptable level of agreement or reliability among raters in coding the study characteristics.

It can be argued that not all studies synthesized in a meta-analysis should be given equal weight. Some studies may be poorly designed and have small unrepresentative samples, whereas other studies use randomized control group designs with large sample sizes. To remedy this problem, studies can be evaluated and assigned a quality score. The meta-analysis can then be calculated with studies weighted by their quality scores.

A source of nonindependence in a meta-analysis can result from using multiple hypothesis tests based on multiple variable measurements obtained from a single study (Strube & Hartman, 1983). One suggested remedy when selecting findings obtained from multiple measures of the hypothesis tests located within a single study is to collapse the various findings into a single, global hypothesis test.

One assumption that should be met before specific studies are quantitatively combined in one meta-analysis is that each study provides sample estimates of the effect sizes that are representative of the population effect size. Homogeneity tests can be calculated to identify any outlier studies. If outliers are identified, they can be removed.

Meta-analysis first appeared in the nursing literature in 1982, when O'Flynn published her article describing meta-analysis in the "Methodology Corner" of *Nursing Research.* A meta-analysis of the effects of psychoeducational interventions on length of postsurgical hospital stay (Devine & Cook, 1983) was the first meta-study analysis published in nursing. Since then, meta-analyses have been conducted and published in a wide variety of areas, such as patient outcomes of nurse practitioners and nurse midwives, job satisfaction and turnover among nurses, relationship between postpartum depression and maternal–infant interaction, effects of educational interventions in diabetes care, quality of life in cardiac patients, and nonnutritive sucking in preterm infants.

The outcome of this quantitative approach for reviewing the literature has tremendous potential for a practice-based discipline such as nursing. Meta-analysis of the abundance of research being conducted can benefit nursing practice. Not only will the use of meta-analysis further knowledge development in the discipline of nursing, but it also can help nurses in the clinical setting to decide whether to apply research findings to their practice based on the size of the difference an intervention makes. Meta-analysis can resolve issues in nursing where there are multiple studies with conflicting findings. In addition, meta-analysis highlights gaps in nursing research for future studies.

Cheryl Tatano Beck

MIDDLE-RANGE THEORIES

Middle-range theories are described by Merton (1968, p. 9) as those that "lie between the minor but necessary working hypotheses that evolve in abundance during day-to-day research and the all-inclusive systematic efforts to develop unified theory." He goes on to say that the principal ideas of middle-range theories are relatively simple. Simple here means rudimentary, straightforward ideas that stem from the focus of the discipline. Thus, middle-range theory is a basic, usable structure of ideas, less abstract than grand theory and more abstract than empirical generalizations or microrange theory. Middle-range theory is a set of related ideas that are focused on a limited dimension of the reality of nursing. These theories are composed of concepts and suggested relationships among the concepts that can be depicted in a model. Middle-range theories are developed and grown at the intersection of practice and research to provide guidance for everyday practice and scholarly research rooted in the discipline of nursing. Typically, middle-range theories are conceptualized and referred to by a topical focus such as story theory (Liehr & Smith, 2008b), uncertainty theory (Mishel & Clayton, 2008), or theory of symptom management (Humphreys, Lee, Carrieri-Kohlman et al., 2008).

More than three decades ago, Ada Jacox (1974) addressed middle-range theory in a classic paper on theory construction in nursing. Since then, there has been ongoing attention to middle-range theory, and it is increasingly recognized for its potential as a foundation guiding practice and research. Smith and Liehr (2008b) report 27 new middle-range theories for a 7-year period beginning in 2000. There are two current books dedicated to middle-range theory (Smith & Liehr, 2008; Peterson & Bredow, 2008), and Parker and Smith include a large section on middle-range theories for practice in their 2010 book.

Although theory has always been forefront in PhD nursing education, the recent development of the doctor of nursing practice degree as well as the push by the nation's hospitals to achieve Magnet designation has created a niche for middle-range theory as a guide for nursing practice and corresponding research. Liehr and Smith (2008a) propose a 10-step process for scholars wishing to translate practice ideas into structures for research that can culminate in middle-range theory.

Middle-range theory is developed within a paradigmatic perspective. For instance, Newman, Sime, and Corcoran-Perry (1991) proposed the particulate-deterministic, interactive-integrative, and unitary-transformative paradigms. Each paradigm is a lens for viewing the world. With the particulate-deterministic lens, processes are causal in nature with antecedents and consequences. With the interactive-integrative lens, processes are relational with rich contexts that contribute to understanding. With the unitary-transformative lens, processes are patterns unfolding over time. The majority of middle-range theories in nursing are conceptualized through the interactive-integrative lens, whereas a smaller number are conceptualized through the unitary-transformative lens and even fewer through the particulate-deterministic lens. For instance, in the Smith and Liehr (2008) book, the editors include nine middle-range theories designated as consistent with the interactive-integrative lens (uncertainty, community empowerment, symptom management, unpleasant symptoms, self-efficacy, family stress and adaptation, cultural marginality, caregiving dynamics, and moral reckoning) and three consistent with the unitary-transformative lens (meaning, self-transcendence, and story). Although there are no middle-range theories conceptualized through the particulate-deterministic lens included in the book, it is possible to create such a theory, but it would tend toward a microrange rather than a middle-range level.

Considerable evidence documents the use of middle-range theory to guide research. A few middle-range theories have associated measurement tools, such as Mishel's Uncertainty in Illness Scale (Mishel, 2008) and Reed's Self-Transcendence Scale (Reed, 2008). Availability of measurement tools that correspond with the theory facilitates use of the theory in research. One of the middle-range theories, the story theory, has an inquiry method that is consistent with the concepts of the theory (Liehr & Smith, 2008a).

Since Merton introduced middle-range theory in academic circles more than 40 years ago, there has been an escalation in the development of middle-range theories for nursing. However, it is essential that nursing scholars persist in testing these theories to maintain a vibrant middle-range theory base guiding the discipline of nursing. Simply proposing a middle-range theory without ongoing testing renders the theory of little use to the discipline. Therefore, it is imperative that existing middle-range theories be used, tested, and refined and that findings from these endeavors be published.

There continues to be a need for relevant discipline-specific theories developed at the middle-range level of discourse. Population or disease-specific theories are not at the middle range. A nursing theory framed at the middle-range level of discourse can be applied across populations and with persons in differing complex health circumstances.

Nurse educators are challenged to integrate middle-range theories into curricula so that students become familiar with these theories as structures that guide practice and research. If educators accept this challenge, building nursing knowledge would shift from an esoteric endeavor to frontline activity for nursing practice. Likewise, nursing scholars have a responsibility to niche research into appropriate nursing theories, thus contributing to the substantive body of nursing knowledge.

Patricia Liehr
Mary Jane Smith

MILD COGNITIVE IMPAIRMENT

Mild Cognitive Impairment (MCI) is a term used to describe individuals who lie somewhere between normal aging and dementia in regard to their cognitive ability (Dubois & Albert, 2004). As far back as the early nineteenth century, Pritchard (1837, cited in Gauthier et al., 2006) described the early stages of dementia as the impairment of recent memories with intactness of distant memories. Then, in the latter part of the twentieth century, researchers sought to define a commonly observed clinical condition characterized by the presence of mild cognitive deficits that preceded dementia and that might therefore be useful in predicting dementia (Molinuevo, Valls-Pedret, & Rami, 2010). The term MCI was originated by Flicker, Ferris, and Reisberg (1991) to describe individuals who exhibited cognitive difficulties at or about stage three on the Global Deterioration Scale (Reisberg, Ferris, de Leon, & Cook, 1982) but who did not meet the clinical criteria for a diagnosis of dementia. In the late 1990s, Petersen et al. (1999) proposed a set of criteria for the MCI concept. These were that (1) the individual themselves reported memory problems, preferably corroborated by an informant; (2) their general cognition was essentially normal; (3) their activities of daily living functioning was essentially normal; (4) objectively, any memory impairment was commensurate with their age and educational level; (5) and they did not have dementia. However, a significant proportion of MCI patients were subsequently found to exhibit deteriorations in other areas of cognition leading a team of researchers at the Mayo Clinic to revise the criteria of Petersen et al. They therefore proposed a set of subtypes to classify a wider range of people with cognitive impairment (Petersen et al., 2001). The amnesic subtype of MCI equates with the general criteria for MCI outlined by Petersen et al. (1999). This subtype is most likely to convert to Alzheimer’s disease (AD) (Molinuevo et al., 2010). Amnesic multidomain MCI involves memory impairment with slight alterations in other areas of cognition, whereas isolated nonamnesic MCI describes individuals whose memory is intact but who have impairment in one aspect of their cognitive domain. Hence, there are many variants of nonamnesic MCI depending on which aspect of cognition is involved, and it is thought that each will progress to different clinical entities (Molinuevo et al., 2010). Finally, multidomain nonamnesic MCI describes individuals who have deficits in two areas of cognition but whose memory remains intact. It is thought that this type of MCI may be a prodrome of Lewy Body dementia (Petersen & Morris, 2005).

To date, no *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition, or *International Statistical Classification of Diseases*, 10th revision, international diagnostic criteria have been established for MCI (Dierckx, Engelborghs, De Raedt, De Deyn, & Ponjaert-Kristofferson, 2007), and there is much disagreement in the literature about the status of the MCI concept; however, most authorities recommend that a diagnosis is reached through a process of clinical judgment, usually based on the Mayo clinic criteria (Chertkow et al., 2007; Petersen, 2004). Others suggest that this may be augmented by the use of standard cognitive functional assessments (Prabhavalkar & Chintamaneni, 2010). Petersen (2004) proposes that most people with MCI fall 1.5 standard deviations below norms on memory tests, and hence these tests may be used in the objective assessment of MCI. However, many of the assessments that are used in AD may not be valid or sensitive enough to detect MCI (Raschetti, Albanese, Vanacore, & Maggini, 2007); hence, in the last decade, a number of more MCI-specific instruments such as the Montreal Cognitive Assessment (Petersen, 2004) and the DemTect (Kalbe et al., 2004) have emerged.

Data from prevalence studies vary considerably for MCI chiefly because of differences in definition and classification. Gauthier et al. (2006) report that prevalence in population-based epidemiological studies ranges from 3% to 19% in those over the age of 65 but that this increases significantly with age. Other research has focused on the rate of progression of MCI to dementia; however, again, results have varied considerably. One recent meta-analysis concluded that although the annual conversion rate from MCI to dementia was approximately 5% to 10%, a majority of individuals will not progress to dementia even after a 10-year follow-up, and some individuals will revert from MCI back to normal (Mitchell & Shiri-Feshki, 2009).

Both genetic and nongenetic factors, such as APOE e4 alleles, depression, social isolation, chronic kidney disease, thyroid dysfunction, testosterone deficiency, estrogen levels, and vitamins B_{12} and D, have been implicated in the etiology of MCI (Etgen, Bickel & Förstl, 2010; Gauthier et al., 2006); however, so far no definitive links have been established. One certainty is that age is the most significant risk factor, and cardiovascular risks such as hypertension and diabetes are also thought to play a prominent role (Molinuevo et al., 2010). Although some promising work is underway into the use of biomarkers in AD, work of this nature in the MCI context is in its infancy (Prabhavalkar & Chintamaneni, 2010).

A number of studies have been conducted into the effectiveness of a variety of pharmacological and nonpharmacological therapies in both the prevention of the conversion of MCI to dementia and the improvement of cognitive functioning in persons with MCI. Clearly, such a discovery would have significant social and economic benefits. In a recent review, Chertkow et al. (2008) concluded that only leisure activities, treatment of sleep disorders, cognitive stimulation, physical activity, opportunities for social interaction, and control of vascular risk factors can be recommended at this time. They found insufficient evidence to recommend any of the drugs reviewed (cholinesterase inhibitors [ChEIs], estrogen therapy, vitamin E, nonsteroidal anti-inflammatory drugs, and ginkgo biloba). Similarly, a review by Massoud et al. (2007) recommended a general healthy lifestyle combined with close monitoring and treatment of vascular disorders and, in addition, gave some support for vitamin B_6, vitamin B_{12}, folate supplements, omega fatty acids, and antioxidants. Other work has indicated that the ChEI galantamine is associated with increased mortality in MCI patients (Loy & Schneider, 2006). Accordingly, ChEIs are not currently recommended in the treatment of MCI (Chertkow et al., 2008; Massoud et al., 2007).

To date, MCI research has been predominantly biomedical and epidemiological, and this is understandable given the relative newness of the concept and the ongoing effort to attain diagnostic clarity and to better understand its pathophysiology. Some nursing research has been conducted; however, much of which has focused on MCI caregivers. Key studies have explored caregiver burden and psychiatric morbidity in spouses (Garand, Dew, Eazor, DeKosky, & Reynolds, 2005), depressed mood among informal caregivers (Yueh-Feng, 2007), and marital quality among couples where one person has MCI (Garand et al., 2007). Future research endeavors might continue to examine the etiology and prevalence of the various subtypes as well as the continued identification of possible biomarkers. Work on validating screening instruments and neuropsychological scales specific to MCI is also needed as is further clarity on the various risk factors and in particular, the manner in which these factors interact (Prabhavalkar & Chintamaneni, 2010). From a nursing perspective, although further work is required on the implications of MCI for informal caregivers, this work might also extend to examinations of the effectiveness of nursing interventions such as those based on the Progressively Lowered Stress Threshold Model (Hall & Buckwalter, 1987); the Need-Driven Dementia-Compromised Behavior Model (Algase et al., 1996), or the Enriched Model of Dementia (Kitwood, 1997), for example, as these have been found helpful in the AD context. Clearly, nursing research also needs to focus on the person with MCI themselves. Considerations of the effects of MCI on patient coping, social support, depression, grief, and anxiety, for example, would be useful at this time, as would work on behavioral symptoms associated with MCI.

Patient problems are many and varied and depend on the MCI subtype, the existence of comorbidities, and the degree of cognitive impairment. Some people with MCI lack insight into the extent of their functional deficits and hence may engage in unsafe activities such as driving or using power tools (Yueh-Feng et al., 2007). Problems with executive functioning such as difficulties operating household appliances, declining cooking skills, difficulties managing finances, and decline in home repair and maintenance skills have also been reported (Chirileanu et al., 2008). Although cognitive symptoms have been the key features of MCI, recent research has demonstrated that like AD, people with MCI may also exhibit behavioral symptoms. Garand et al. (2005, 2007), for example, found “repeatedly asking the same question,” “trouble remembering recent events,” “losing or misplacing things,” “forgetting what day it is,” and “talking little or not at all” to be common and to be among the most stressful symptoms for family caregivers. Lopez, Becker, and Sweet (2005) reported disruptive and psychotic behaviors that are more usually found in established dementia such as agitation, aggression, delusions and hallucinations, and disorders of mood such as depression and apathy among some individuals with MCI. The presence of behavioral and psychological signs such as these generally indicate a high likelihood of progression to overt dementia (Huang & Cummins, 2004).

MCI is associated with significant morbidity and economic loss as well as distress to individuals, families, and society (Yeuh-Feng et al., 2007). Although some evidence suggests that the economic costs of MCI in primary care are not significantly different from those of individuals without cognitive deficits (Luppa et al., 2008), many cases of MCI will progress to dementia. It is well established that dementia is a costly illness. Noneconomic costs to the individual include anxiety and depression associated with prognostic uncertainty; performance difficulties at work before diagnosis, which may lead to retirement earlier than might have been expected; loss of intimacy, relationships, and roles as the condition progresses; and loss of dignity and personhood. Implications for spouses and family are similar and also include the burden and mental health impact of caring for someone with increasing dependency (Garand et al., 2005). Significant losses also accrue to society, chief among which is the loss of productivity if the person has to take early retirement, and in time, the additional economic burdens of caring for someone with progressive cognitive impairment (Yeuh-Feng et al., 2007). These and other hidden costs of MCI need to be explored and also need to be targeted with evidence-based interventions to diminish the adverse social and economic consequences of MCI (Molinuevo et al., 2010).

Given that people with MCI generally continue to function with a good degree of independence, they usually live and are cared for at home. Nursing practice therefore primarily involves supportive interventions such as the provision of education and information; maximizing independent living; assisting clients and family members in planning for the future, in particular the formulation of advance directives and nominating enduring powers of attorney; monitoring and intervening in the physical and mental health status of both the person with MCI and their family caregivers; monitoring MCI progression; promoting health, in particular nutritional and vascular health; running support groups for both care recipient and caregiver; and in collaboration with other health professionals, the provision of cognitive stimulation, physical, and other evidence-based therapies (Hodson & Keady, 2008).

MCI represents a transition state between normal aging and dementia. Although the proposed diagnostic criteria are still too broad and experts have thus far failed to agree on a definition, clinical evidence has shown that many patients with MCI will progress to some form of dementia. Accordingly, early diagnosis and intervention in MCI would seem prudent as this may delay the onset of dementia. The advantages of this are apparent. Currently, despite the disagreements in the literature about the status of MCI, there appears to be great scope for nursing involvement, particularly in the areas of health promotion and in the provision of evidence-based interventions for both care recipient and caregiver alike.

Mark P. Tyrrell
Geraldine McCarthy

MORAL DISTRESS

Moral distress occurs when a person is aware of a moral problem, acknowledges moral responsibility, and makes a moral judgment about the correct action yet is constrained from the self-determined morally correct action. Moral distress is not a response to a violation of what is unquestionably right but rather a violation of what the individual judges to be right. Moral distress has been studied in a number of settings and with several professions. It is acknowledged as a serious problem, and researchers are beginning to identify implications for education, research, and practice.

Ethicists define an ethical or moral dilemma as a moral problem for which two or more solutions carry equal weight, thus making decisions very difficult. In the early 1980s, ethicist Andrew Jameton (1984) asked a group of nurses to relate their personal stories of moral dilemmas. The nurses in Jameton's study did not identify "dilemmas" according to the common definition but consistently described situations with compelling moral problems for which the morally correct action was clear, yet each felt constrained from following personal convictions (Jameton, 1993). Jameton concluded that nurses were compelled to tell these stories because of their profound suffering and their belief about importance of the situations. Identifying this new category of moral problem, Jameton wrote, "*Moral distress* arises when one knows the right thing to do, but institutional constraints make it nearly impossible to pursue the right course of action" (Jameton, 1984, p. 6). Further refining the concept, Jameton (1993) added that in cases of moral distress, nurses participate in the action that they have judged to be morally wrong. On the basis of Jameton's work, Judith Wilkinson, a nurse, defined moral distress as "the psychological disequilibrium and negative feeling state experienced when a person makes a moral decision but does not follow through by performing the moral behavior indicated by that decision" (Wilkinson, 1987–1988, p. 16). Further refining the definitions or offering examples for clarification, nearly every subsequent source relies on either Jameton's or Wilkinson's definitions of moral distress.

Reports of the number of nurses who experience moral distress vary. Redman and Fry (2000) report that at least one third of nurses in their study ($n = 470$) experienced moral distress (2000). Nearly 50% of nurses in another study ($n = 760$) report that they had acted against their consciences in providing care to the terminally ill (Solomon et al., 1993). Possibly heralding the present nursing shortage, Wilkinson's, Millette's, and Nathaniel's studies indicate that 45% ($n = 24$), 50% ($n = 24$), and 43% ($n = 21$) of nurses in their respective samples left their units or nursing altogether because of morally troubling situations.

Loss of nurses from the workforce is an indirect but strong patient care threat that may perpetuate moral distress. In 2001, nurses reported poor working conditions such as inadequate staffing, heavy workloads, increased use of overtime, and lack of sufficient support staff (General Accounting Office, 2001). In 2005, Buerhaus et al. (2005) reported that more than 75% of registered nurses believe the nursing shortage diminishes the quality of their work life and the quality of patient care. Nearly all nurses surveyed predicted that the continuing nursing shortage will increase stress on nurses (98%), lower patient care quality (93%), and cause nurses to leave the profession (93%) (Buerhaus et al., 2005). Thus, the nursing shortage may lead to moral distress. Moral distress, in turn, causes nurses to leave the workforce, thus creating a self-perpetuating downward spiral.

Moral distress occurs in high stress situations or with vulnerable patients. Areas that engender high overall stress levels, such as critical care or other areas with very vulnerable patients, harbor a greater proportion of moral problems (Corley, 1995; Fenton, 1988; Forchuk, 1991a; Hefferman & Heilig, 1999; Kelly, 1998; Krishnasamy & Plant, 1998; Liaschenko, 1995; Millette, 1994; Perkin, Young, Freier, Allen, & Orr, 1997; Powell, 1998; Redman & Fry, 2000; Rushton, 2006; Solomon et al., 1993; Sundin-Huard & Fahy, 1999). In the studies listed above and others, moral distress has been documented in the following specific situations: prolonging the suffering of dying patients through the use of aggressive/heroic measures; performing unnecessary tests and treatments; lying to patients or failing to involve nurses, patients, or family in decisions; and incompetent or inadequate treatment by a physician.

Institutional setting also contributes to moral distress. Health care institutions, particularly hospitals, are high tech and fast paced, patients are older and sicker, and reimbursement is problematic. Many nurses view themselves as powerless within this type of hierarchical system (Corley, Elswick, Gorman, & Clor, 2001; Davies et al., 1996; Krishnasamy, 1999; Liaschenko, 1995; Perkin et al., 1997; Sundin-Huard & Fahy, 1999; Wilkinson, 1987–1988). They perceive little support from nursing and hospital administration. Nurses may experience moral distress as a result of being socialized to follow orders, having experienced futility of past actions, and having a fear of losing a job. Other organizational factors contributing to nurses' moral distress include their views concerning the quality of nursing and medical care, the organizational ethics resources, the nurses' satisfaction with the practice environment, and the law and/or lawsuits.

Relationships with physicians are the most frequently mentioned institutional constraints. Nurses experience moral distress as a result of physicians and nurses having different moral orientations, different decision-making perspectives, and adversarial physician–nurse relationship (Corley, 1995; Davies et al., 1996; Liaschenko, 1995; Oberle & Hughes, 2001; Powell, 1998; Sundin-Huard & Fahy, 1999; Wilkinson, 1987–1988).

Moral distress results in unfavorable outcomes for both nurses and patients. It can lead to physical and psychological problems, sometimes for many years (Anderson, 1990; Davies et al., 1996; Fenton, 1988; Kelly, 1998; Krishnasamy, 1999; Nathaniel, 2006; Perkin et al., 1997; Wilkinson, 1987–1988). Among participants in one study, every respondent described some detrimental effect of moral distress (Elpern, Covert, & Kleinpell, 2005). Some nurses lose their capacity for caring, avoid patient contact, and fail to give good physical care because of moral distress (Corley, 1995; Hefferman & Heilig, 1999; Kelly, 1998; Millette, 1994; Nathaniel, 2006; Redman & Fry, 2000; Wilkinson, 1987–1988). Individuals may cope with moral distress in a variety of ways including avoiding patient interaction, acting in secret, working fewer hours, leaving the unit in search of better conditions, or dropping out of nursing altogether (Austin, Kagan, Rankel, & Bergum, 2008; Kelly, 1998). Austin, Bergum, and Goldberg (2003) suggest that some nurses have stopped listening to the call of their patients, having chosen to avoid engagement.

The psychosocial consequences of moral distress include blaming others, excusing their own actions, self-criticism, self-blame (Kelly, 1998), anger, sarcasm, guilt, remorse (Fenton, 1988; Wilkinson, 1987–1988), frustration, sadness, withdrawal, avoidance behavior, powerlessness, dispiritedness (Austin et al., 2003), burnout (Davies et al., 1996), betrayal of personal values, sense of insecurity, self-doubt, unease (Deady & McCarthy, 2010), low self-worth (Krishnasamy, 1999), and effects on spirituality (Elpern et al., 2005). Nurses may also choose to desensitize themselves by adapting or acquiescing to cultural pressures or by rationalizing, denying, or trivializing or distancing themselves from moral problems (Deady & McCarthy, 2010). In addition, evidence suggests that prolonged or repeated moral distress leads to loss of nurses' moral integrity (Kelly, 1998; Rushton, 1995; Wilkinson, 1987–1988).

Moral distress sometimes causes cause unpleasant physical and affective problems. Physical reactions include weeping (Anderson, 1990; Fenton, 1988), sweating, palpitations, headaches, diarrhea, and sleep disturbances (Anderson, 1990; Nathaniel, 2006; Wilkinson, 1987–1988). Affective reactions include anger, frustration, depression, shame, embarrassment, grief, sadness, and a sense of ineffectiveness (Austin et al., 2008).

The early studies of moral distress focused on nurses, but within the last decade, moral distress has been identified as a problem for a variety of disciplines around the globe. Researchers from Canada, Norway, Spain, Ireland, Portugal, Sweden, Uganda, Jordan, China, Chile, and Israel have demonstrated the presence of moral distress among physicians, podiatrists, psychologists, psychiatrists, childbirth educators, nurse anesthetists, respiratory care practitioners, pharmacists, physical therapists, dental hygienists, health systems managers, and rehabilitation professionals (Eizenberg, Desivilya, & Hirschfeld, 2009; Krishnasamy & Plant, 1998; Losa Iglesias, Becerro de Bengoa Vallejo, & Salvadores Fuentes, 2010; Mitton, Peacock, Storch, Smith, & Cornelissen, 2010; Mrayyan & Hamaideh, 2009; Mukherjee, Brashler, Savage, & Kirschner, 2009; O'Ryan, 2010; Radzvin, 2008; Schwenzer & Wang, 2006; Sporrong, Höglund, & Arnetz, 2006; Sporrong, Höglund, Hansson, Westerholm, & Arnetz, 2005).

Moral distress remains a relatively immature concept. It has been studied from a number of theoretical perspectives and methods. Because of the nature of moral distress, most nurse researchers have chosen to use qualitative methods including grounded theory, ethnography, phenomenology, survey research, case study, and qualitative descriptive analysis. Others have begun to develop and refine quantitative means of measuring moral distress and some have used mixed methods (Corley et al., 2001; Eizenberg et al., 2009; Morris & Dracup, 2008; Raines, 2000; Sporrong et al., 2006).

Moral distress is a pervasive problem that may lead to a number of consequences. Causing harm to nurses, diminishing the quality of patient care, and contributing to the nursing shortage, moral distress is a problem that requires continued study. Strategies to prevent moral distress and mitigate its effects are imperative and interdisciplinary cooperation is needed to further understand its causes and effects.

Alvita Nathaniel

Moral Reckoning

The Grounded Theory of Moral Reckoning in Nursing identifies a lengthy and painful process—before, during, and after the acute phase of moral distress. *Moral distress* occurs when a person is aware of a moral problem, acknowledges moral responsibility, and makes a moral judgment about the correct action yet is constrained from the self-determined morally correct action (Jameton, 1984, 1992; Nathaniel, 2006; Wilkinson, 1987–1988). Moral distress is not a response to a violation of what is unquestionably right but rather a violation of what the individual judges to be right. Moral distress has been studied in a number of settings and with several professions. Moral distress is acknowledged as a serious problem and researchers are beginning to identify implications for education, research, and practice, but few have examined the process over time—what are the conditions previous to the events that lead to moral distress and what are its long-term consequences? The theory of moral reckoning examines a more inclusive process surrounding moral distress.

Moral reckoning is a process that occurs when nurses experience moral distress. Ethicists define an ethical or moral dilemma as a moral problem for which two or more solutions carry equal weight, thus making decisions very difficult. In the early 1980s, ethicist Andrew Jameton (1984) discovered a new type of moral problem, undefined in previous ethics literature. He uncovered this problem when he asked a group of nurses to relate their personal stories of moral dilemmas. The nurses responses did not meet the definition of "dilemma," in which there are two solutions to a moral problem, each with equal moral weight. Rather, the nurses consistently described situations in which the morally correct solution was clear, yet each felt constrained from following personal convictions (Jameton, 1993). Identifying this new category of moral problem, Jameton (1984) wrote, "*Moral distress* arises when one knows the right thing to do, but institutional constraints make it nearly impossible to pursue the right course of action" (p. 6). Subsequently, Jameton (1993) stipulated that nurses who experience moral distress believe that they participated in the action that they judged to be morally wrong. On the basis of Jameton's original study, many nurse researchers have studied moral distress. Findings from these, mostly qualitative, studies consistently reinforce Jameton's original findings. The grounded theory of moral reckoning takes a conceptual perspective on a larger process that includes and surrounds moral distress.

Moral reckoning includes a critical juncture in nurses' lives and explains a process that includes motivation and conflict, resolution, and reflection (Nathaniel, 2006). Moral reckoning is a three-stage process that offers important implications for nursing practice, education, and administration. Distinct stages include the stage of ease, the stage of resolution, and the stage of reflection.

During the stage of ease, nurses are motivated by core beliefs and values to uphold congruent professional and institutional norms. They are comfortable: They have technical skills and are feeling satisfied to practice within the boundaries of self, profession, and institution. They know what is expected of them and experience a sense of flow and at-homeness. The stage of ease continues as long as the nurse is fulfilled with the work of nursing and comfortable with the integration of core beliefs and professional and institutional norms. For some, though, a morally troubling event will challenge the integration of core beliefs with professional and institutional norms. Nurses find themselves in *situational binds* that herald a critical juncture in their professional lives. A situational bind interrupts the stage of ease and places the nurse in turmoil when core beliefs and other claims conflict. Situational binds force nurses to make difficult decisions and give rise to critical junctures in their lives. Binds involve serious and complex conflicts within individuals and tacit or overt conflicts between nurses and others—all having moral/ethical overtones. Inner dialogue leads the nurse to make critical decisions—choosing one value or belief over another. Types of situational binds include (a) conflicts between core values and professional or institutional norms, (b) moral disagreement in the face of power imbalance, and (c) workplace deficiencies. These binds lead to consequences for nurses and patients.

Situational binds constitute crises of intolerable internal conflict. The move to set things right signifies the beginning of the stage of resolution. For most, this stage is a critical juncture that alters professional trajectory. There are two foundational choices in the stage of resolution: making a stand or giving up. These choices are not mutually exclusive. In fact, many nurses give up initially, regroup, and make a stand. Others make an unsuccessful stand and later give up. Moving from the stage of resolution, nurses reflect as they reckon their behavior and actions. The stage of reflection may last a lifetime. In most cases, the incidents nurses recall occurred early in their careers. The stage of reflection raises questions about prior judgments, particular acts, and the essential self. The properties of the stage of reflection include remembering, telling the story, examining conflicts, and living with consequences. These properties are interrelated and seem to occur in every instance of moral reckoning.

Sampling, investigation, and analysis of moral reckoning followed the classic grounded theory method as described by Glaser and Strauss (1967) and subsequently by Glaser (1965, 1978, 1998, 2001). The classic grounded theory allowed the investigator to discover theoretically complete explanations of moral reckoning and to maintain a consistent philosophical stance.

Glaser and Strauss (1967) were said to have broken new ground in 1967 when they described this new inductive method which "discovers" theoretically complete explanations about particular phenomena, but they did not explicate the method's philosophical stance. In an attempt to clarify the grounded theory method, many scholars have published opinions about grounded theory's ontological position. Because Glaser and Strauss rarely discussed ontology, published speculations lead to a confusion of conflicting labels including realist, constructivist, critical realist, objectivist, relativist, interactionist, positivist, postpositivist, and others. Many claim that the philosophical foundation is symbolic interactionism. Although the originators of the method did not delve into its foundations, inferences from Glaser's (1978, 1998, 2001) writings clarify the method's ontological position. Glaser recognizes that (1) there is an objective reality that can be observed; (2) inasmuch as it is possible, the investigator gathers data from the perspective of the research participant; and (3) grounded theory sheds light on latent patterns. Although neither Glaser and Strauss's original description of grounded theory nor Glaser's subsequent development identify it's philosophical foundations, their published references to objective reality, participant perspective, and latent patterns are consistent with the American pragmatist philosophical foundation. Therefore, it is from this perspective that the moral reckoning has been studied.

Moral reckoning explains the process that surrounds moral distress, a pervasive problem that may lead to a number of long-lasting consequences. Because moral distress causes harm to nurses, diminishes the quality of patient care, and contributes to the nursing shortage, the larger process of moral reckoning requires continued study. Strategies to prevent moral distress and mitigate the long-lasting effects that occur as nurses reckon their role in the distressing situation are imperative. Further research, now in process, includes expanding the investigation to better understanding the causes and consequences of moral reckoning and to compare the process among nursing and other disciplines.

Alvita Nathaniel

MOTHER–INFANT/TODDLER RELATIONSHIPS

The study of mother–infant/toddler relationships centers on knowledge related to the health and development of the mother–child dyad from birth to 3 years. This focus of inquiry is necessarily large because the mother–child system is an open one, responsive to genetic, biological, environmental, cognitive, and psychological influences (National Research Council and Institute of Medicine, 2000, 2009; National Scientific Council on the Developing Child, 2004).

The mother–infant/toddler relationship is influenced by genetic and constitutional factors such as the child's temperament. Temperament is an inborn constellation of traits that affect the individual's behavioral reactions to environmental stimuli (De Pauw & Mervielde, 2010). Temperamental qualities, such as high-intensity reactions, low adaptability to change, or shyness, influence children's abilities to regulate emotions in stressful situations, relate to others, and adjust to changes in daily routines. Similar temperamental qualities in the mother are likely to affect her ability to adjust her parenting behaviors to accommodate an unpredictable infant or a defiant 2-year-old (Gross & Conrad, 1995; Karreman, de Hass, van Tuijl, van Aken, & Dekovi, 2010). A poor fit between parent and infant/toddler temperamental styles has been associated with more child behavior problems and increases in physiological indices of stress (Bridgett et al., 2009; Bugental, Olster, & Martorell, 2003).

However, temperament can be moderated by the social environment of the mother and child (Barry, Kochanska, & Philibert, 2008; Karreman, de Hass, van Aken, & Dekovic, 2009). Children with a "difficult" temperament who are reared by mothers who are responsive and positive in their parenting techniques are less likely to have behavior problems when compared with similar children reared in dysfunctional family systems (Karreman et al., 2009).

Recently researchers have studied the expression of genes to identify physiological mechanisms affecting parents' sensitivity to an infant or toddler's behavioral cues. Studies suggest that patterns in the genetic expression of neurotransmitters, chemical messengers in the brain, may increase or decrease social sensitivity depending on the expressed genetic allele and the social environment of the family (Way & Taylor, 2010).

Biological factors can also influence the child's developmental trajectory, making parenting more stressful and altering the quality of the mother–infant/toddler relationship. For example, low-birth-weight infants with neonatal medical complications are at greater risk for later developmental difficulties (Aarnoudse-Moens, Weisglas-Kuperus, van

Goudoever, & Oosterlaan, 2009; Boyce, Smith, & Casto, 1999). Research has found that when compared with normal birth weight peers, low-birth-weight children have greater difficulty in sustaining attention, are at risk for poorer academic performance, have more problems regulating their emotions, and are more likely to have internalizing behavioral difficulties (Aarnoudse-Moens et al., 2009). Even in the absence of medical complications, mothers of low-birth-weight infants tend to experience greater stress and caregiver burden than mothers of normal birth weight infants (May & Hu, 2000; Singer, Ethridge, & Aldana, 2007). Such early biological risk can have significant effects on the quality of the mother–infant/toddler relationship. Caregiver burden has been shown to decrease maternal quality of life which in turn increases parenting stress. High levels of parenting stress can negatively impact the parent–child relationship and reciprocally affect the child's quality of life (Lee, Hwang, Chen, & Chien, 2009).

The relationship between parenting environment and the mother–infant/toddler relationship has been extensively studied, although the theory underlying cause-and-effect relationships remains poorly understood. For example, there are many hypotheses to account for the significant associations found between parenting in low-income environments and poorer outcomes in very young children (Blair et al., 2008; Duncan & Brooks-Gunn, 1997; Mistry, Vandewater, Huston, & McLloyd, 2002; Shonkoff, Boyce, McEwen, 2009). As a result, interventions for promoting healthy parent–child relationships among low-income families simultaneously target many environmental risk factors (e.g., support, psychological guidance, education, nutrition, and facilitating access to community-based services). The complexity of the parenting environment and understanding how social contexts in early life affect young children and parents has been an important area of study.

The psychological health of the mother and child has received much attention. Maternal stress, low social support, marital discord, and maternal depression have been viewed as important factors placing young children at risk for poor developmental outcomes (Gao, Paterson, Abbott, Carter, & Iusitini, 2007; Gross, Sambrook, & Fogg, 1999; Petterson & Albers, 2001; Perry & Fantuzzo, 2010). Recently, researchers have shifted the focus away from unidirectional to bidirectional effects. For example, depressed mothers who are sad, preoccupied, and irritable may be unable to attend to their infant's needs or to deal calmly and effectively with their toddler's demands for attention. However, it is also possible that behaviorally demanding children cause mothers to feel ineffective, fatigued, and ultimately depressed. The clinical implications of viewing problems in the mother–infant/toddler relationship as bidirectional is that effective nursing interventions should focus on the mother–child dyad or the family unit rather than on the mother or child alone (National Research Council and Institute of Medicine, 2009).

In the past 10 years, greater attention has been placed on the role of race/ethnicity in the development of the mother–infant/toddler relationship. Demographic trends toward greater multiculturalism and expectations for researchers to understand how parenting processes may differ across racial/ethnic groups have led to more thoughtful examinations of parenting processes among families of color (Coll et al., 1998; McLloyd, Cauce, Takeuchi, & Wilson, 2000). Different family structures and childrearing values will affect how parents socialize their infants and toddlers. Although all children thrive under the care of a loving and responsive parent, research has shown that there is no single way that love and attention need to be expressed. Indeed, research has shown that some parenting strategies that negatively affect behavioral outcomes in European American children appear to have no such affect on African American children (Berlin et al., 2009; Dodge, McLoyd, & Lansford, 2005).

Finally, maternal cognitions affect how mothers interpret and respond to their children's behavior. For example, a mother's belief that using corporal punishment with her defiant 2-year-old may be based on a series of cognitions related to her values about child defiance and physical punishment, cultural expectations, perceived environmental dangers, how she was raised, and her knowledge of alternative discipline strategies (Garvey, Gross, Delaney, & Fogg, 2000; Goodnow & Collins, 1990; Stack, Serbin, Enns, Ruttle, & Barrieau, 2010). Socialization behaviors such as the mother's ability to regulate her own emotional reactions will affect the child's ability to self regulate. In essence, mothers are the social role model for their child and can positively or negatively influence the child's behavior through day to day experiences. Research has shown that this behavior transcends generations with grandmothers influencing the parenting behaviors of mothers who in turn affect their child's emotional reactivity and future parenting behavior (Stack et al., 2010).

Although many investigators have understandably narrowed their research to one or two conceptual areas of inquiry, the dyad is dynamically affected by all of these influences. That is, mothers identify parenting goals and devise child-rearing strategies that are consistent with their temperaments, biology, child-rearing environments, cognitions, and psychological capacities (Gross, 1996). Likewise, children's responses to parents are similarly tied to these same factors. Future research should refine how these influences transact within the parent–child relationship so that research methods can be clarified and cost-effective nursing interventions disseminated to populations in need.

To date, a number of intervention strategies for improving mother–infant/toddler relationships have been validated. Among the most well researched are home visiting programs (e.g., Olds et al., 2007), in which parents receive a range of services designed to improve maternal and infant health and parent training programs (e.g., Centers for Disease Control and Prevention, 2009b; Gross et al., 2009), designed to teach parents skills that promote positive parenting and reduce behavioral risk in young children.

Deborah Gross
Shelly Eisbach

MUSIC THERAPY

Music therapy is the use of music for the purpose of improving physiological and psychological health and well-being. For music to be therapeutic, there must be an interaction between the music and the person who desires a health outcome from the music (Meyer, 1956). This implies that there are individual, age, culture, and situation-related differences in choice and effect. The saying that music is a universal language gives the false impression that everyone appreciates and is helped by the same music. Although all cultures of the world use music in some form and derive meaning from it, different cultures and different generations are accustomed to listening to widely divergent kinds of music. There may be large differences in volume, pitch, rhythm, tempo, harmony, disharmony, words, and meaning (Cross, 2003). In addition, there is variation within age and cultural groups (Good, Picot, Salem, Picot, & Lane, 2000).

Music therapy may be provided by a registered music therapist who has been taught to use music in many therapeutic ways. However, any member of the health care team may suggest to patients that soft music can be helpful for stress, pain, and mood and can use stimulating music to encourage socialization, expression, and exercise. Nurses can assess musical preferences, offer a choice of selections, and encourage patient involvement in the music with the goal of achieving specific health outcomes.

Throughout history, music has been used for a variety of therapeutic purposes by primitive people to ward off evil spirits, to prevent or cure illnesses, to relieve depression, to modify emotions, and to achieve inner harmony. Early cultures had little means to treat disease, so music and spirituality were used to provide comfort and help people cope. During the Renaissance, physicians became interested in the therapeutic value of music and incorporated it in their training and practice. From the seventeenth century onward, physicians studied the effect of music on physiology and psychology and debated whether to focus on the type of music that was effective versus the type of person who responds positively to music. Florence Nightingale used music with injured soldiers in the Crimea. She had recreation areas where recovering men could go to listen to singing or playing of musical instruments.

At the beginning of the twentieth century, the first laboratory studies of the physiological effects of music were conducted on animals and humans. These experiments demonstrated changes in vital signs and body secretions in response to various types of music. They are rejected by most investigators today because of the poor quality of measurement, analysis, and control. In the 1930s, music began to be used in patients' hospital rooms, in surgery before general anesthesia, and during local anesthesia. Music was used in obstetrics and gynecology to reduce the side effects of inhalation anesthetics.

Nursing reviews of research on the effect of music on health outcomes can be found in chapters by Good (1996), Guzzetta (1988, 1997), Standley and Hanser (1995), and Snyder and Chlan (1999). The American Music Therapy Association and two journals, the *Journal of Music Therapy* and the *Music Therapy Perspectives*, are excellent resources.

Music can transport patients' thoughts to a new place, give them new perspectives, lift their mood, provide comfort, familiarity and pleasure to patients, and stimulate memories, meanings, and self-insight. In addition, studies have shown that music reduces pain and anxiety, reduces muscle tension, raises levels of beta-endorphins, and lowers adrenocorticotropic stress hormones. Music has been found to improve the immune system, salivary cortisol, postoperative and cancer pain, sleep, nausea and vomiting of chemotherapy, mood during stem cell transplantation, pain of osteoarthritis, and cardiac anxiety and autonomic balance. It has also been effective for acute and chronic pain and during stressful or painful procedures (e.g., injections, gastrointestinal endoscopy, and lumbar punctures). Music has been generally found to reduce anxiety before, during, and after surgery, during burn debridement, in chronically ill patients, and after myocardial infarction. It has been studied for circumcision pain in infants, for injection pain in children and adults, for disturbances in psychiatric, demented, and agitated patients, in the critically ill, in dyslexic children, in postanesthesia patients, in the emergency department, and in those who are comatose or dying. Lullabies have shown beneficial effects on preterm infants. A double-blind study of music during surgery showed effects on recovery. In mice, music reduced stress and metastasis and improved immune factors.

Music has been categorized into stimulative and sedative types. Stimulative music has strong rhythms, volume, dissonance, and disconnected notes, whereas sedative music has a sustained melody without strong rhythmic or percussive elements. Stimulative music enhances bodily action and stimulates skeletal muscles, emotions, and subcortical reactions in humans. Sedative music results in physical sedation and responses of an intellectual and contemplative nature (Gaston, 1951). Precategorization by the nurse, however, does not consider the kind of subject response. Other ways of categorizing are slow and fast music, or by type of music or instrument.

To choose music that is therapeutic, the nurse should consider the nature of the music, the patient preferences, and the health state. Nurses can assess patients' sex, cultural background, musical preferences, music training, participation in music, degree of auditory discrepancy, time available, and, most of all, degree of liking for the music under consideration. Variations in the nature of the health state determine whether music will be used to cheer, encourage, soothe, relax, distract the mind, stimulate exercise, or evoke emotions of joy, triumph, resolve, or peace. Studies have indicated that different kinds of music result in positive or negative feelings and differences in serotonin. Music is economical for patient use. Tapes, compact discs, and players are relatively inexpensive, and a small library can be maintained on any nursing unit. Music piped into patients' rooms also may be available. Nurses can suggest that patients and their families bring in favorite music from home that is likely to invoke healthy responses. They can refer patients to a music therapist if one is available.

There are some contraindications and considerations when using music for patients. Contraindications include hypersensitivity to sound, tone deafness, musicogenic epilepsy, and inability to recognize music in some stroke patients. Nurses should consider any patient dislike for any particular selection or type of music, their inability to turn it off when desired, cochlear implants, and culturally incongruent music. In addition, those with hearing loss may or may not find that listening to music is beneficial. Future research in music may include studies that determine the kinds of music that are effective for health outcomes in countries around the world and between cultures in each country. More work on comparing symptomatic response with physiological response is needed to generate theories of conditions in which music is effective, how it affects body processes, and what effect it has on recovery, immune function, and health.

Music brings an air of normalcy, entertainment, pleasure, and escape into a world where illness is often the enemy and both patients and caregivers are fighting back. Music is an integral part of most people's normal lives and should not be forgotten when they go to hospitals and other health care facilities. With the increased reliance on technology in health care today, music can add a humanistic touch. Beyond the humanistic value of music is the therapeutic value in reducing stress, pain, anxiety, and depression and promoting movement, socialization, and sleep.

Marion Good

N

Narrative Analysis

Narrative analysis is a specific analytic approach in the more general field of narrative research or narrative inquiry. *Narrative analysis* is defined as an analytic process involving structuring, interpretation, and recontextualization applied to human stories constructed by narrators who are situated in specific personal and social contexts of their lives. Narrative analysis does not refer to one specific analytic technique or strategy as there is a variety of ways stories are analyzed and interpreted, which are sometimes suggested for consolidation in application for an in-depth understanding of the work of narratives and narratives themselves (Mishler, 1986, 1995; Riessman, 1993, 2001). Narrative analysis has a grounding in many different disciplines and is being applied in various research traditions: literary studies, linguistics, anthropology, psychology, sociology, theology, history, and practice disciplines such as nursing, medicine, occupational therapy, and social work. Narrative analysis has been gaining popularity among nurse researchers during the past two decades as one approach to study human experiences of both clients and nurses, especially from the perspective of interpretivism.

All sorts of oral and written representations are considered narratives—fables, folktales, short stories, case histories, exemplars, news reports, personal stories, historiography, and interview data. Although there are controversies, the term *narrative* in narrative analysis refers to a story that contains two or more sequentially ordered units, with a beginning, middle, and ending, and representing structured meaning. Narratives are structured about a story plot or plots illustrated by characters (actors) and events. Narratives as stories are characterized by a sense of internal chronology (either temporal or thematic) and connectedness that brings about coherence and sense making. Narratives differ from discourse in that narratives contain descriptions of chronologically articulated events along with sketches of characters within the stories.

As narratives are human linguistic products, their constructions are closely tied to "storytelling," that is, the processes involved in producing them. In narrative analysis, storytelling is often the object of analysis, along with narratives themselves.

The heterogeneity of narratives, the representative disciplinary plurality, and the varieties in narrative theories have been evidenced in various approaches and orientations in narrative analysis. There are at least three diverse orientations within narrative analysis: (a) structural orientation, (b) storytelling orientation, and (c) interpretive orientation (for other ways of categorizing narrative analysis, see Mishler, 1995; Polkinghorne, 1988; Riessman, 1993).

Structural orientation can be identified with structuralists such as Barthes (1975) and sociolinguists such as Labov (1972) and Gee (1991). In this orientation, narratives are thought to be organized about a specific set of structural units that bring about coherence and connectivity in the narratives. Attention to narrative structures is analytically juxtaposed to such aspects as functions that different structural units perform, sense making in story, and narrativity. Narrative analysis in the structuralist tradition within literary studies and linguistics focuses on structural–functional connections, as in Propp's (1968) morphology in relation to internal patterning and narrative genre and in Genette's (1988) three specific aspects of a story's temporal articulation (i.e., order, frequency, and duration).

Sociolinguists within this orientation attend to "natural" or "situated" narratives, which are constructions produced in specific situations of social life. Labov (1972) and Labov and Waletzky (2003) identified six structural units for fully formed narratives: abstract, orientation, complicating action, evaluation, resolution, and coda. These structural units are related to two functions in narrative: the referential function and the evaluative function. Gee (1991), on the other hand, identified structural properties of narrative as poetic structures of lines, stanzas, or strophes, which organize meaning constructions in telling a story. The structural orientation is primarily an examination of structural elements of story in relation to the narrative's form, function, and meaning.

In storytelling, narratives are viewed not simply as products that can be taken out of the context of narrating but as process-oriented constructions that are enmeshed with linguistic materialization of cognition and memory, interactive structuring between the teller and listener, and contextually and culturally constrained shaping of experiences and ideas. From this standpoint, narrative analysis is closely aligned with discourse analysis, as in ethnography of communication in anthropology and ethnomethodology in sociology.

Narrative analysis in this orientation is differentiated into two schools: linguistic/cognitive and sociocultural. The linguistic/cognitive version focuses on how narratives are materialized in language from ideas and experiences. This construction is viewed to be accomplished by applying communicative and interactive functions of language and through scripting and schematizing of yet unorganized information into connected storytelling. In this version, storytelling is considered as the processing of nonlinguistic ideas, events, and actions into a series of connected and coherent representation of meanings.

On the other hand, narrative analysis in the sociological version within the ethnomethodological tradition is concerned with the interactive process of narrative making. Conversational narratives are of prime interest. The listener is an active part of storytelling as an interactive participant in the making of a story. From an anthropological perspective, storytelling is viewed as bounded by cultural conditions and cultural categories. Narrative analysis in this orientation carries out an analysis of narrative texts in terms of form and content, along with an analysis of the flow of storytelling, with the assumption that the nature of narrative text is integrally connected to the processes of construction.

Narratives in the interpretive orientation are chronological in a double sense: chronology in terms of temporal serialization of events and chronology in terms of temporality of story itself. Ricoeur (1984) specified episodic and configurational dimensions as the temporal dialectics that integrate plots in narrative. Hence, narratives are stories of individuals etched within the communal stories of the time and context. Narrative analysis thus involves interpretation of representation posed within the contexts in which the story is shaped and the storytelling occurs, reflecting on the worldviews that provide a larger contextual understanding. In this sense, the interpretive orientation is more concerned with meaning of narratives than with either the structure or the process.

Riessman (1993) offered five levels of representation in the research process of narrative analysis: attending, telling, transcribing, analyzing, and reading. Interpretation occurs at the levels of transcribing and analyzing by the researcher, whereas the level of reading implies additional interpretation that occurs in the readers of research reports. Riessman favored the use of poetic structures as the mode of structuring narratives as interpretive; however, the use of any specific structuring model is less critical for the analysis than is interpretation.

Within the interpretive orientation in narrative analysis, critical narrative analysis has emerged within the last decade (Holstein & Gubrium, 2000). Critical narrative analysis is aligned with critical philosophy and is based on the assumptions that knowledge is ideologically, historically, and culturally embedded (Gergen, 1994), and language use and meanings in language are socially constructed entrenched with power (Foucault, 1972). Critical narrative analysis, therefore, focuses on critiquing how patterns of power and social practices shape and construct narratives as well as storytelling (Emerson & Frosh, 2004).

Although there are distinct differences among these orientations, there are many hybrid forms of narrative analysis used in actual research practice. Hybrid forms often combine analysis of process or meaning with structural analysis. In nursing research, narrative analysis has been applied with various orientations and in different hybrid forms. The literature in nursing reveals some confusion in the use of narrative analysis as a research method, such as in (a) using it inappropriately instead of discourse analysis, (b) applying to research with textual data but without focus on stories, or (c) using in combination with techniques within grounded theory, phenomenological analysis, or ethnography without either theoretical or methodological justification. Although many scholars including Mishler (1995) suggested for each individual researcher in narrative research to design and apply a set of specific strategies for narrative analysis, there is a need for a rigor in specifying one's theoretical and methodological commitments regarding narratives and narrative knowledge in such methodological formulation. Research of narrative accounts of clients and nurses, as well as their interactions, can produce deep understanding of human experiences that are fundamental to nursing practice.

Hesook Suzie Kim

NATIONAL INSTITUTE OF NURSING RESEARCH

The National Institute of Nursing Research (NINR) is one of 27 institutes and centers that comprise the National Institutes of Health (NIH). The NIH is one of 12 operating divisions of the U.S. Department of Health and Human Services. Headquartered in Bethesda, Maryland, the NIH is the nation's medical research agency—making important medical discoveries that improve health and save lives. Thanks in large part to NIH-funded research, Americans today are living longer and healthier. Life expectancy in the United States has jumped from 47 years in 1900 to 77 years today, and disability in people older than 65 years has dropped dramatically in the past three decades. In recent years, nationwide rates of new diagnoses and deaths from all cancers combined have fallen significantly. More than 80% of the NIH's budget goes to more than 300,000 research personnel at over 3,000 universities and research institutions. In addition, about 6,000 scientists work in NIH's own laboratories, most of which are on the NIH main campus. The campus is also home to the NIH Clinical Center, the largest hospital in the world totally dedicated to clinical research.

In the fall of 2010, NINR commemorated the 25th anniversary of its establishment at the NIH. Originally designated as the National Center for Nursing Research by Public Law 99–158 in 1986, it attained institute status through the NIH Revitalization Act of 1993. Its budget of $16 million in 1986 has grown to $145 million in 2010. The original staff of 9 members has increased to nearly

100 people, including scientists, administrators, and support staff.

NINR supports clinical and basic research to build the scientific foundation for clinical practice, prevent disease and disability, manage and eliminate symptoms caused by illness, and enhance end-of-life and palliative care. NINR's research portfolio is greater than 90% clinically focused. Although NINR does support basic research, which has historically comprised a large proportion of the NIH research portfolio, the institute has always been a leader at NIH, and across the broader biomedical community, in clinical research and research translation.

Over the past 25 years, NINR-supported scientists have addressed clinical and policy deficiencies across the health and health care spectrum, improving—often transforming—practice guidelines and public policies on the basis of their research findings. NINR grantees have led the way in bringing person-centered, point-of-care translational research to the forefront of the health sciences by investigating all dimensions of health including fundamental issues of quality of care and quality of life in disparate settings from the neonatal intensive care unit (NICU) to nursing homes; preventative interventions and symptom management in acute critical care settings and in the realm of chronic disease; and health promotion for individuals, families, and communities across the life span and across generations.

NINR's focus on science that spans the full disease spectrum and all stages of life enables the institute to explore and address some of the most important challenges affecting the health of the American people. These issues include improving management of chronic illness, including in persons with comorbid conditions; developing new strategies for preventive health that are culturally relevant at a time of increasing ethnic, racial, and cultural diversity and in the face of persistent health disparities; enhancing the ability to translate emerging patient management technologies into clinical practice and home- and community-based use; and developing future research and clinical workforce at a time of increased demand across numerous sectors of the health care system.

A fundamental part of NINR's mission is developing the next generation of scientists. The percentage of NINR's budget allocated to training is nearly twice the NIH average. Under its training programs, NINR supports graduate and postgraduate research fellowships and career development awards, including awards to trainees from underrepresented and disadvantaged backgrounds. Many NINR-trained scientists will also serve as faculty in schools of nursing, responsible for educating future nurses that are vital to improving patient health and the effectiveness of the nation's health care.

NINR supports a number of specialized training programs designed to promote career advancement and provide the next generation of scientists with the skills necessary to address today's most pressing issues. For example, the NINR Summer Genetics Institute is an intensive summer training program that provides graduate students and faculty with a foundation in molecular genetics to enhance their research and clinical practice. Along with supporting numerous other predoctoral and postdoctoral research opportunities, NINR also participates in the NIH Graduate Partnerships Program, a doctoral fellowship training program that coordinates training and funding for doctoral students attending schools of nursing with established NINR-supported training programs. Another program, the K22 Career Transition Award, funds postdoctoral research in two phases: an intramural phase at NIH and an extramural phase to aid the transition to tenure-track research and faculty positions. In addition, the BNC Fellowship, supported by the Bravewell Collaborative, NINR, and the NIH Clinical Center, trains individuals on how to address key issues in integrative health research.

In NINR's role as the lead NIH institute for end-of-life research, an area of increasing importance in public policy, the institute seeks to apply interdisciplinary biological, behavioral, and social science strategies to advance understanding of the challenges of a life-threatening illness, improve palliative care, and enhance quality of life for dying patients and their informal caregivers. In 2009, NINR established the NINR Office of Research on End-of-Life Science and Palliative Care, Investigator Training, and Education to coordinate research efforts in these critical areas of science.

The first NINR director, Dr. Ada Sue Hinshaw, who held the position from 1987 to 1994, is widely recognized for her contributions to teaching, nursing research, and academic administration. Under her leadership, the institute was established as an active participant within the federal research community and achieved national recognition for nursing research.

The current director, Dr. Patricia A. Grady, an internationally recognized stroke researcher, was appointed in 1995 following positions as deputy director and acting director of the National Institute of Neurological Disorders and Stroke. Dr. Grady has authored or coauthored numerous articles and papers on hypertension, cerebrovascular permeability, vascular stress, and cerebral edema. She is an editorial board member of the major stroke journals. Dr. Grady lectures and speaks on a wide range of topics, including future directions in nursing research, developments in the neurological sciences, and federal research opportunities. In addition to her numerous honors for her scientific accomplishments, Dr. Grady is a past recipient of the NIH Merit Award and received the Public Health Service Superior Service Award for her exceptional leadership.

Applications received by NINR, and across all of NIH, are evaluated for funding through a two-stage peer review process. In the first stage, applications assigned to NINR are reviewed and scored for scientific merit by an Initial Review Group, a panel that consists of experts in fields of research relevant to the application. Scored applications then undergo a second stage of review by the National Advisory Council for Nursing Research. Upon completion of the required reviews, final funding decisions are made by NINR based on the Initial Review score, advisory council recommendations, portfolio analysis, and fiscal considerations. This peer review system ensures that all applications to NINR receive full and fair consideration and that NINR supports only the best science.

Individuals who are interested in submitting applications for grants to conduct research in areas of interest to the institute are encouraged to visit www.ninr.nih.gov to learn more about research opportunities and proposed areas of investigation before embarking on the application process. General questions regarding the NINR may be addressed to Office of Science Policy and Information, NINR, NIH, Building 31, Room 5B10, 31 Center Drive, MSC 2178, Bethesda, MD 20892-2178; telephone: (301) 496-0207; email: info@ninr.nih.gov.

Patricia A. Grady

NEUMAN SYSTEMS MODEL

The Neuman Systems Model (NSM) provides a broad, comprehensive, systems approach as a framework for the profession of nursing to organize care, educate future providers, and conduct research. The model offers a holistic approach, a wellness orientation, client perception, and motivation with a systems perspective of variable interaction with the environment (Neuman, 2001, p. 12). Two components form the foundation of the model: exploring the client's response to stressors and identifying the nurse's preventive interventions that assist the client in responding to these stressors. The ultimate goal of nursing is to assist the client in achieving the goals of an optimum state of wellness. Primary components of the NSM include stressors, lines of defense and resistance, levels of prevention, the five client systems variables (basic structure, interventions, internal and external environment, and reconstitution; Neuman, 2001). The nurse is an intervener who uses three levels of prevention (primary, secondary, and tertiary) to achieve the goal of reducing the client's encounter with stressors and mitigating the impact of the stressor. The client or client system may be an individual, group, family, and community and is composed of five interrelated variables (physiological, psychological, sociocultural, developmental, and spiritual). Health, according to Neuman (2001), is equated with living energy, determined by the degree of harmony among the five client variables and basic structure factors, on a continuum from wellness to illness. The degree of wellness is determined by the amount of energy required to retain, attain, or maintain system stability (Neuman, 2001, p. 12). An integrative review of NSM-based research conducted by Fawcett and Giangrande (2001) found 200 research reports with an analysis focused on general information, scientific merit, and the NSM. Gigliotti and Fawcett (2001) reviewed 212 research reports and identified different instruments explicitly linked to the NSM—sometimes more than once and for different purposes. To enhance and facilitate future research related to the NSM, Neuman and Fawcett (2001) have established a set of guidelines for NSM-based research.

Patricia Hinton Walker

NEUROBEHAVIORAL DEVELOPMENT

Neurobehavioral development may be viewed as a genetically determined process by which the primitive central nervous system (CNS) achieves maturity in form and function. Neurodevelopment also depends on the environment since CNS development occurs through an "experience expectant" process in which normal species-typical experiences enable the CNS to make the structural and functional changes necessary for the next stages of development (Greenough, Black, & Wallace, 1987). In order to balance the needs of the present developmental stage and the anticipated needs of subsequent stages, this process is somewhat plastic (Oppenheim, 1981). When an infant is placed in an atypical environment, such as a neonatal intensive care unit, ontogenetic adaptation is affected. Although the infant may initially adapt successfully, changes in the trajectory of the infant's neurobehavioral developmental may be maladaptive at older ages. The effects of this disturbance vary depending on the timing and severity of environmental stresses, individual genetic background, the interaction of genetic background and prenatal history, adaptations made to uterine stresses, and specific neurological insults. Infants probably develop normally when neural plasticity—the process by which the brain develops new connections after neural damage—compensates for abnormalities due to any atypical ontogenetic adaptation and neurological insults. Infants exhibit abnormal neurobehavioral development when neural plasticity is not able to compensate or when compensatory processes result in structural or functional changes that are maladaptive at later ages.

The Synactive Model of Neonatal Behavioral Organization provides a framework for exploring the concept of neurobehavioral development. Als (1986) and Als, Duffy, and McAnulty (1996) have proposed a dynamic model for assessing infant behavioral organization. They suggested that the behavioral organization displayed by an infant is a reflection of the infant's central nervous system integrity, defined as the potential for the brain to develop normally. The infants' behaviors reflect subsystems of functioning, which include the autonomic, motor, state, attentional or interactive, and regulatory systems. The autonomic system controls physiologic functions that are basic for survival such as respiration and heart rate. The motor system involves muscle tone, infant movements, and posture. State organization encompasses clarity of states and the pattern of transition from one state to another. The attentional or interactional system can be observed only in the alert state and is indicative of an infant's ability to respond to visual and auditory stimulation. An infant's regulatory system reflects the presence and success of an infant's efforts to achieve and maintain a balance of these other subsystems.

Another framework used is the perspective of developmental science, a multidisciplinary field that brings together researchers and theorists from psychology, biology, nursing, and other disciplines (Cairns, 1996; Miles & Holditch-Davis, 2003). In this perspective, infants are viewed as developing in a continuously ongoing, reciprocal process of interaction with the environment. Infants and their environments form a complex system, consisting of elements that are themselves systems, such as the mother and child, interacting together so that the total system shows less variability than that of the individual elements. Moreover, plasticity is assumed to be inherent in the infants, their families, and the environment. Infants are active participants in their families and the greater environment, constantly changing them at the same time that the physical and social environment is influencing the infant. Interactions, rather than causation, are the focus of this perspective. No action of one element can be said to cause the action of another because interactions between elements are simultaneous and bidirectional. The interactions affecting development of infants are too complex to ever be totally identified, and infants can achieve the same developmental outcomes through different processes.

Newborn behavior, which includes sucking and sleeping and waking, is the infant's primary expression of brain functioning and the critical route for communication with adults. Investigation of these behaviors and their central mechanisms is essential for nursing in understanding of the needs of infants and in planning interventions to improve their neurodevelopmental status.

The idea of evaluating the vitality and central nervous system integrity of a neonate by assessing sucking is not new. Nutritive sucking is initiated in utero and continues to develop in an organized pattern in the early weeks after birth. It involves the integration of multiple sensory and motor central nervous system function (Wolff, 1968). Sucking behaviors are thought to be an excellent barometer of central nervous system organization. They can be quantified in detailed analysis and are disturbed to various degrees by neurologic problems.

The work of Medoff-Cooper and colleagues (Medoff-Cooper, Bilker, & Kaplan, 2001; Medoff-Cooper, McGrath, & Shults, 2002; Medoff-Cooper, McGrath, & Biler, 2000) demonstrated that changes in the pattern of nutritive sucking behaviors can be described as a function of gestational age in healthy preterm and full-term infants. They reported that sucking patterns change systematically with increasing postmenstrual and gestational age, with a strong correlation between increasing maturation and more organized sucking patterns (Medoff-Cooper et al., 2002). When comparing sucking behaviors at term of 213 extremely early born infants (gestational age ≤29 weeks), more mature preterm infants (30–32 weeks gestational age), and newly born term infants, sucking behaviors were noted to be a function of gestational age at birth and the interaction of maturation and experience. Extremely early born preterm infants demonstrated less competent feeding behaviors than either more mature preterm infants or newly born full-term infants.

Lau, Smith, and Schandler (2003) also found that with increasing postmenstrual age (PMA), preterm infants demonstrated significant improvement in feeding performance.

They reported a significant relationship between average bolus size and sucking pressures and sucking frequency. The ability to tolerate, as well as adapt to, increasing bolus size serves as an indicator of maturation in feeding behaviors.

Gewolb, Bosma, Reynolds, and Vice (2003) used increasing rhythmic stability as the index of maturation of sucking or feeding behaviors. In their comparison of healthy preterm infants and preterm infants with bronchopulmonary dysplasia, an increase in stability of rhythm and uniformity of waveform morphology was correlated with feeding efficiency and increasing PMA in healthy preterm infants. This relationship was not found to be true in the bronchopulmonary dysplasia cohort. They hypothesized that that the poor feeding efficiency may be related to decreased respiratory reserves or to nonspecific neurologic impairment.

Mizuno and Ueda (2005) assessed the feeding behavior of preterm infants by measuring sucking pressure, frequency, duration, and efficiency, as well as the coordination of swallowing and respiration. The sucking efficiency significantly increased between 34 and 36 weeks after conception and exceeded 7 ml/min at 35 weeks. There were significant increases in sucking pressure and frequency and in duration between 33 and 36 weeks. Swallowing patterns demonstrated maturational changes as well, which occurred mostly during pauses in respiration at 32 and 33 weeks and then at the end of inspiration after 35 weeks.

The potential link between nutritive sucking and future developmental problems has been identified throughout the feeding literature. One early study by Burns et al. (1987) showed that infants with significant intraventricular hemorrhage were delayed in their ability to achieve a nutritive suck reflex. At week 40, only 75% of the 110 infants demonstrated mature nutritive sucking patterns. Medoff-Cooper and Gennaro (1996) reported that sucking organization or rhythmicity was a far better predictor than was neonatal morbidity of developmental outcome at 6 months of age. At 12 months of age, organized feeding patterns at 40 weeks PMA was significantly correlated with both Mental Developmental and Psychomotor Developmental Index (Medoff-Cooper et al., 2009). Mizuno and Ueda (2005) found significant correlation between feeding assessment and neurodevelopmental outcome at 18 months. The sensitivity and specificity of feeding assessment were higher than those of ultrasound assessment. In summary, nutritive sucking, a noninvasive and easily measured behavior, appears to be an excellent index of neurodevelopment in preterm infants.

Sleeping and waking states are clusters of behaviors that tend to occur together and represent the infant's level of arousal, responsivity to external stimulation, and central nervous system activation. Three states have been identified in adults: wakefulness, non-REM sleep, and REM sleep. In infants, it is also possible to identify states within waking and states that are transitional between waking and sleeping. Infant sleep states are usually designated as active and quiet sleep because the electrophysiological patterns associated with sleep in infants are different than those in adults.

Because of newborn infants' neurological immaturity, EEG and behavioral scoring of states in preterm and full-term infants provide quite similar results. Sleeping and waking states in infants can be validly scored either by using EEG or by directly observing infant behaviors. Four standardized systems for scoring behavioral observations of sleep–wake states are currently being used by nurse researchers: the 6-state system developed by T. Berry Brazelton, the 10-state system of Evelyn Thoman (1990), the 12-state system from Heideliese Als's (2003) Assessment of Preterm Infant's Behavior, and the Anderson Behavioral State Scale developed by Gene Anderson (Holditch-Davis & Blackburn, 2007). These systems define states in very similar ways and are probably equally useful for clinical purposes. However, the Brazelton system is the most limited for research as it can only be used with infants between 36 and 44 weeks PMA, and Thoman's is the most flexible as it has been used with 27-week PMA preterm infants through 1-year-olds.

Sleeping and waking states have widespread physiological effects. The functioning of cardiovascular, respiratory, neurological, endocrine, and gastrointestinal systems differs in different states. Sleeping and waking also affect the infant's ability to respond to stimulation. Thus, infant responses to nurses and parents depend to a great deal on the state the infant is in when the stimulation is begun. Timing routine interventions to occur when the infant is most responsive is an important aspect of current systems of individualized nursing care.

Studies have indicated that sleep and waking patterns are closely related to neurological status (Halpern, MacLean, & Baumeister, 1995). State patterns of infants with neurological insults differ markedly from those of healthy infants. Abnormal neonatal EEG patterns are associated with severe neurological abnormalities and major neurodevelopmental sequelae during childhood. Also, preterm infants with severe medical illnesses exhibit patterns of sleep–wake states that differ from those of healthier preterms, although most of these differences disappear when infants recover (Holditch-Davis & Blackburn, 2007). Sleep and wakefulness may be directly related to brain development. For example, because REM sleep is less common in adults than non-REM sleep but active sleep is more common than quiet sleep in infants, active sleep has been hypothesized to be necessary for brain development (Roffwarg, Muzio, & Dement, 1966). Also, EEG changes over age in sleep architecture, increasing spectral energies, and greater spectral EEG coherence probably indicate maturational changes in the brain, including synaptogenesis, evolution of neurotransmitter pools, and myelination.

Sleep–wake patterns can also be used to predict developmental outcome (Ednick et al., 2009). Measures of sleep–wake states during the preterm predict Bayley scores during the first year. Developmental changes and stability in the amounts of specific sleep behaviors during the preterm period and the first year are related to developmental and health outcomes in the second and third year. EEG sleep measures in preterm infants have been related to developmental outcome at up to 8 years (Holditch-Davis & Blackburn, 2007). For example, Arditi-Babchuk, Feldman, and Eidelman (2009) found that rapid eye movement activity at 32–36 weeks PMA was related to Bayley scores at 6 months. Infants who showed more rapid active sleep development in the preterm period had higher average cognitive skills and better language and fine motor abilities at 3 years than those of other preterm infants (Holditch-Davis, Belyea, & Edwards, 2005). In summary, sleeping and waking patterns appear to provide an excellent index of neurodevelopmental status in preterm and full-term infants that can be scored either behaviorally or by EEG.

Barbara Medoff-Cooper
Diane Holditch-Davis

NEWMAN'S THEORY OF HEALTH

Margaret Newman's contributions to nursing science and practice span 35 years of sustained scholarship on her theory of health as expanding consciousness. Her theory is a grand theory, focusing on a unitary-transformative paradigm for nursing and on research as praxis.

Newman's (1979) conceptual framework of health was introduced in her book *Theory Development in Nursing*. This framework was expanded and refined in two editions of *Health as Expanding Consciousness* (Newman, 1986, 1994) and in *Transforming Presence*

(Newman, 2008) as the theory of health as expanding consciousness. Newman's theory was inspired by her own nursing experiences and grounded in Rogers' science of unitary human beings. She viewed health as a manifestation of underlying unitary field pattern rather than as a health–disease dichotomy. *Health* was defined as a unitary pattern of the whole, reflecting the dynamic, evolving human–environment process of expanding consciousness, which occurs within a multidimensional matrix of movement, time, and space. *Consciousness* was defined as the informational capacity of the whole. *Nursing practice* was defined as a mutual process of attunement during which the underlying patterns of the patient and nurse are identified, and both individuals are transformed.

Newman was an early eloquent advocate to identify and develop a paradigm addressing nursing's unique knowledge. She described a new unitary-transformative paradigm and contrasted it with the prevailing particulate-deterministic and interactive-integrative paradigms (Newman, Sime, & Corcoran-Perry, 1991). In the unitary-transformative paradigm, "a phenomenon is viewed as a unitary, self-organizing field embedded in a larger self-organizing field" (Newman et al., 1991, p. 4) and is identified by its pattern and interaction with the larger whole. Change is unidirectional and unpredictable. Systems move through stages of organization and disorganization to increasingly complex levels.

Newman first stated that the two prevailing paradigms were relevant, but not sufficient, for nursing practice and nursing science (Newman et al., 1991). Later she saw the unitary-transformative paradigm as the only paradigm for nursing (Newman, 1997). She now considers that the unitary-transformative paradigm includes and moves beyond the particulate-deterministic and interactive-integrative paradigms (Newman, 2008).

According to Newman, the nurse–patient relationship is nursing's unifying construct (Newman, Smith, Pharris, & Jones, 2008). The nurse–patient relationship is a caring, mutual process that creates a shared consciousness (Newman et al., 2008). The nurse focuses on what is most meaningful to the patient. By being fully present and resonant with the patient, the nurse facilitates pattern recognition. Pattern recognition results in expanded consciousness, through which the nurse and patient are ultimately transformed. The nurse remains nonjudgmental and nonprescriptive, staying engaged with the patient until insight occurs.

Newman's highly abstract grand theory was published at a time emphasizing empirical, practice-based nursing theories. Newman's theory became more accepted, particularly by holistic nurses and in countries with less linear views of time, as other disciplines changed their worldviews to align more closely with a unitary-transformative paradigm. There is a need for the healing interpersonal nature of the nurse–patient relationship as populations age and health care becomes more technology oriented. As the population becomes more multicultural, nursing educators are teaching students to deal with polarities and foster connections between different types of people.

Newman (1990b) identified the lack of conceptual fit between conventional quantitative research methods and the unitary-transformative paradigm. She posited research as praxis methodology combining research, practice, and theory. In this hermeneutic method, the patient and nurse mutually identify, describe, and verify the patient's patterns from narrative data about the most meaningful people and events in the patient's life.

Early quantitative research using conventional methods tested propositions derived from Newman's conceptual framework of health, focusing on the concepts of movement, time, space, and consciousness (Engle, 1996). Adults were studied in community and laboratory settings. Elaboration and refinement of Newman's theory shifted the research focus to health as expanding consciousness, unitary field pattern, and research as praxis. Adults, adolescents, and families were studied in community and health care settings. Research conducted in New Zealand, Japan, Iceland, Australia, and Canada supports the universality of Newman's theory using research as praxis methodology.

Newman's visionary theory of health exemplifies the relationship between theory, practice, and research. Nursing's unitary-transformative paradigm, the nurse–patient relationship, and research as praxis provide direction for contemporary nursing practice and nursing research. Newman anticipated that future nursing education will focus on helping nurses become creative enquirers and transformative learners (Newman, 2008).

Emily J. Fox-Hill
Veronica F. Engle

NIGHTINGALE, FLORENCE

Florence Nightingale was born on May 12, 1820, in Florence, Italy, and died on August 13, 1910, in London, England. She is considered the founder of contemporary nursing and nursing education and an expert on health care statistics, hospital design and construction, and military health care. Nightingale's remarkable success at decreasing the death rates during the Crimean War gave birth to legends of the Lady with the Lamp. Her personal fame was critical to her ability to gain attention for her ideas, including those about the value of nurses. Nightingale's birthday is remembered each year as International Nurses' Day, and it is the anchor date for Nurses' Week in the United States.

Nightingale's contribution was the attention she brought to nursing education and in developing a system for nursing education that was secular and could be replicated in many different places. By the time she died, "Nightingale schools" could be found in 24 countries on five continents (Donahue, 1996).

Nightingale has further contributed to nursing by identifying what has become known as the metaparadigm of nursing: person, environment, health, and nursing (Fawcett, 1978). She also established a firm tradition of basing nursing practice on carefully collected and analyzed data, the forerunner of today's evidence-based practice emphasis. Nightingale's most widely circulated work is *Notes on Nursing: What It Is and What It Is Not* (Nightingale, 1859/1969).

Nightingale's writings contain a clear conceptualization of the client, nursing goals, and nursing interventions (Meleis, 2004). The essential concepts she considered were the patient, the patient's environment, and nursing. She defined nursing as putting "the patient in the best condition for nature to act upon him" (Nightingale, 1859/1969, p. 133) through scrupulous attention to "fresh air, light, warmth, cleanliness, [and] quiet, and the proper selection and administration of diet" (p. 8). *Health* was defined as being "able to use well every power we have to use" (Nightingale, 1885, p. 1043). Health was affected by environmental factors, as well as by dietary choices and adequate amounts of exercise (Nightingale, 1863a).

Nightingale's most far-reaching ideas may have been her conceptualizations of persons, their environments, and the interaction between them that affected health. She identified persons as having physical, intellectual, social, emotional, and spiritual components (Nightingale, 1859/1969). Her holistic view of human beings continues to be a hallmark of nursing, differentiating it from other health care professions.

She initially came to her beliefs about the environment's role in health in Scutari, where she was greeted by filthy conditions and a high hospital mortality rate. Healthy hospitals provided sufficient fresh air, light, and space and subdivided the sick into separate buildings or pavilions. Using these data, Nightingale laid out detailed plans for the construction of hospitals, including site selection, and hospitals for special populations such as children.

Tamara L. Zurakowski

NOSOCOMIAL INFECTIONS

Health-care-associated infections (HCAIs) are a major problem in health care settings globally, making surveillance and prevention a key priority in institutions committed to patient safety. Acquisition of an HCAI results in a prolonged hospital stay; increased resistance of microorganisms to antimicrobials; additional financial burden for patients, their families, and the health services; and increased patient mortality.

Global estimates indicate that more than 1.4 million patients in developed and developing countries are affected at any time (World Alliance for Patient Safety, 2005). It is difficult to pinpoint exactly how many people suffer from HCAI because the diagnosis is complex, relying on multiple criteria and not on a single laboratory test (Pittet et al., 2005). National surveillance systems exist in some countries, for example, the National Nosocomial Infection Surveillance system in the United States (http://www.cdc.gov/ncidod/dhqp/nnis.html). However, international comparisons are often difficult due to differences in surveillance methods or lack of national surveillance systems (Cunney et al., 2006). In addition, in some settings such as long-term care, HCAI appears to be a hidden problem (Ryan et al., 2009).

In general, 5–15% of hospitalized patients and 9–37% of patients admitted to intensive care units (ICUs) acquire HCAIs in developed countries (World Alliance for Patient Safety, 2005; Vincent, 2003). Reports from hospital-wide prevalence rates of patients affected by HCAI in Europe range from 4.6% to 9.3% (Eriksen, Iversen, & Aavitsland, 2005; Gikas et al., 2002; Klavs et al., 2003). The HELICS (Hospital in Europe Link for Infection Control through Surveillance) data report that 5 million HCAIs are estimated to occur in acute care hospitals in Europe annually, representing around 25 million extra days of hospital stay and an economic burden of €13–24 billion. Mortality due to HCAI in Europe is estimated to be 1% (50,000 deaths per year) and contributes to death in at least 2.7% of cases (135,000 deaths per year; http://helics.univ-lyon1.fr/helicshome.htm). In the United States, the estimated HCAI incidence rate was 4.5% in 2002, corresponding to 9.3 infections per 1,000 patient-days and 1.7 million affected patients; approximately 99,000 deaths were attributed to HCAI (Stone, Braccia, & Larson, 2005).

Many factors have been shown to be associated with the risk of acquiring an HCAI in developed countries. These factors can be related to the infectious agent (e.g., virulence, capacity to survive in the environment, and antimicrobial resistance), the host (e.g., advanced age, low birth weight, underlying diseases, state of debilitation, immunosuppression, and malnutrition), and the environment (e.g., ICU admission, prolonged hospitalization, invasive devices and procedures, and antimicrobial therapy). The HCAI burden is greatly increased in high-risk patients such as those admitted to ICUs as a result of using various invasive devices (e.g., central venous catheter, mechanical ventilation, or urinary catheter; World Health Organization, 2005).

The economic burden of HCAI in the United States was approximately US$ 6.5 billion in 2004 (Stone et al., 2005). The most frequent type of infection hospital-wide was urinary tract infection (36%), followed by surgical site infection (20%), bloodstream infection, and pneumonia (both 11%; Klevens et al., 2007), which follows the same trend as other developed countries such as Ireland, Scotland, Wales, and England (Smyth et al., 2008).

Controlling acquisition of HCAIs is an enormous challenge in developing countries where basic infection control measures are virtually nonexistent. Lack of basic equipment and understaffing and overcrowding are generally the result of lack of financial resources. In addition, poor levels of education, malnutrition and other types of infections (HIV), or diseases combine to make control of HCAIs an almost insurmountable challenge (Pittet et al., 2008). Hospital-wide studies report HCAI rates higher than those in developed countries (Allegranzi & Pittet, 2007). For example, prevalence rates of up to 19.1% were reported in 1-day prevalence surveys recently carried out in single hospitals in Albania (Faria et al., 2007) and Morocco (Jroundi et al., 2007; Subhash, Nirmala, & Shekhar, 2009). The most frequently reported HCAIs were surgical site infections. Neonatal infections were reported to be 20 times higher among hospital-born babies in developing than in developed countries (Zaidi et al., 2005)

A limited number of studies from developing countries assessed HCAI risk factors by multivariate analysis. Prolonged length of stay, surgery, and intravascular and urinary catheters were frequently identified (Agarwal, Gupta, Ray, Aggarwal, & Jindal, 2006; Gosling, Mbatia, Savage, Mulligan, & Reyburn, 2003; Metintas, Akgun, Durmaz, & Kalyoncu, 2004).

There is an established body of knowledge underpinning the link that exists between the environment where health care workers deliver care and patient outcomes such as mortality, morbidity, failure to rescue, falls, and medication errors (Aiken, Clarke, & Sloane, 2002; Laschinger & Leiter, 2006; Rafferty et al., 2007). However, very little has been written on the link that may exist between the work environment and control of infection (Roberts & Cookson, 2009). The focus has been predominantly on health care workers hand hygiene practices (Gould, Chudleigh, Moralejo, & Drey, 2007). Little success has been achieved, and health care workers hand hygiene practices remain suboptimal (Creedon et al., 2008).

For the most part, research into the relationship between hospital organizational features and patient outcomes has concentrated on constructing multivariate models to examine the effects of structural hospital characteristics (ownership, teaching status, size, and technology) on inpatient mortality such as measurement of severity of illness (Green, Passman, & Wintfeld, 1991; Mukamel, Zwanziger, & Tomaszewsk, 2001; Shortell et al., 1994). However, there is growing interest in investigating nurses' work environment, particularly because its importance in maintaining patient safety was highlighted by the Institute of Medicine in the United States (Institute of Medicine, 2004b). Most often, when the variable "nursing" is included in multivariate models investigating the effects of structural hospital characteristics, nurse skill mix and staffing are reported as significant predictors of mortality (Estabrooks, Midodzi, Cummings, Ricker, & Giovannetti, 2005; Unruh, 2008). In general, research into hospital organizational characteristics related to nursing practice and variation in hospital outcomes have developed independently of one another. Research on the organization of nursing has been primarily concerned with nurse outcomes such as job satisfaction and turnover (Curtis, 2007; McCarthy, Tyrrell, & Lehane, 2007)

Although there are a number of studies exploring the relationship between nurse staffing and patient outcomes, few have explored the operant mechanism through which organizational variables (such as nurse staffing) influence patient outcomes. Researchers who have explored the operant mechanism resulting from hospital organizational features that impact on the work environment identify with the concept of structural empowerment (Donahue, Piazza, Griffin, Dykes, & Fitzpatrick, 2008; Jayne Faulkner, 2008; Laschinger, Finegan, Shamian, & Wilk, 2001). Positive perceptions of structural empowerment have been repeatedly reported by nurses in hospitals renowned for their excellence in patient outcomes, for example, Magnet hospitals (Lake, 2007; Laschinger, Almost, & Tuer-Hodes, 2003). The dimensions of structural empowerment are access to provision of information, support, opportunity, resources, and formal and informal power (Kanter, 1977).

Preliminary findings from a recently conducted national study by the author of this chapter indicate a significant relationship between nurses' perceptions of structural empowerment and prevalence of HCAIs in acute care hospitals in Ireland. Data were drawn from two sources: (a) a national postal survey of nurses' perceptions of structural empowerment in acute care hospitals Ireland and (b) Third Prevalence Survey of Healthcare-Associated Infections in acute care hospitals in Ireland.

The magnitude and scope of the HCAI burden worldwide appear to be very important and greatly underestimated. Methods to assess the size and nature of the problem exist and can contribute to correct monitoring and to finding solutions. A lot has been written on health care workers hand hygiene practices as a preventative strategy. Much less has been written on the environment where health care workers deliver care and its relationship to the risk of patients acquiring HCAIs. Findings from a national survey of nurses in Ireland make a cogent contribution to extending this body of knowledge.

Sile A. Creedon

NURSE ENGAGEMENT

Work engagement is defined as a positive, satisfying, emotional state while working. It is characterized by vigor, dedication, and absorption. Vigor is exemplified by high energy levels, mental resilience, and the motivation to invest effort at work. Dedication is demonstrated by a sense of importance, enthusiasm, inspiration, pride, and challenge toward work. Absorption entails full concentration, being deeply engrossed in work, the quick passage of time, and a reluctance to detach oneself from work (Schaufeli, Salanova, Gonzalez-Roma, & Bakker, 2002).

Work engagement has been studied in a wide variety of occupational groups and is associated with many positive outcomes. Engaged employees are committed to the organization, display personal initiative, have a strong motivation to learn, and are more likely to remain employed (Demerouti, Bakker, De Jonge, Janssen, & Schaufeli, 2001; Schaufeli & Bakker, 2004; Sonnentag, 2003). Furthermore, engaged employees respond well to change, quickly adapt to a new environment, and easily switch from one activity to another (Schaufeli & Salanova, 2007). Work engagement is positively associated with a decrease in health complaints, and there is evidence that it is contagious in groups (Demerouti et al., 2001; Schaufeli & Bakker, 2004; Schaufeli & Salanova, 2007). Because work engagement is associated with many positive employee and organizational outcomes, the study of nurse engagement is important to the health and future of the nursing profession.

The investigation of work engagement emerged after years of research on burnout. In fact, prior to 2002, work engagement was measured by the opposite pattern of scores on the Maslach Burnout Inventory, the instrument most often used to assess burnout (Maslach, Schaufeli, & Leiter, 2001). Schaufeli et al. (2002) asserted that burnout and work engagement were not direct opposites but were conceptually distinct concepts that should be measured independently. They argued that an employee who is experiencing burnout is not necessarily work engaged. Reversibly, an employee who is low on work engagement may not necessarily be experiencing burnout. In addition, they argued that the relationship between burnout and work engagement could not be empirically studied if measured with the same instrument. As a result, they developed and tested the Utrecht Work Engagement Scale (UWES). The UWES is a 9- or 17-item questionnaire with a 7-point Likert scale response set that yields three subscale scores and a total score that range between 0 and 6. Higher UWES scores indicate higher levels of work engagement (Schaufeli, Bakker, & Salanova, 2006).

Nurse engagement has been the subject of minimal research. However, when compared with other occupational groups, nurses demonstrate relatively high levels of engagement. Although nurses made up only 3.4% of the 12,631 subjects upon which the UWES norm scores were based, nurses' absorption scores were among the top three occupational groups (Schaufeli & Bakker, 2003). Palmer, Quinn Griffin, Reed, and Fitzpatrick (2010) reported mean dedication scores in the high range (4.96) for a sample of 84 acute care registered nurses attending a nursing conference. These same nurses had mean total engagement, vigor, and absorption scores in the high-average range (4.60, 4.52, and 4.39, respectively). Simpson (2009) found high-average mean total engagement, dedication, and absorption scores (4.29, 4.65, and 4.34, respectively) for a sample of 167 registered nurses working on medical–surgical units within six hospitals.

Qualitative studies suggest that nurse engagement is intimately linked to the choice of nursing as a profession. The selection of a career in nursing often results from a desire to find meaning and purpose in life through helping others. When these core values find expression in nursing practice, an inspirational strength which nurtures engagement has been described (Vinje & Mittelmark, 2007). While working, nurses are exposed to human suffering, life-altering events, and mortality. Nurses who have an expanded repertoire of personal responses are more successful at creating positive meaning and personal fulfillment from emotionally challenging patient-caring experiences. As a result, their commitment to and engagement with their work increase (Montgomery, 1997). Mackoff and Triolo (2008) found that a characteristic of engaged nurse managers is the ability to maintain sight of their impact on direct patient care.

Quantitative studies have also associated nurse engagement with the desire to find meaning in life through work. Tomic and Tomic (2010) reported a positive correlation between all three aspects of nurse engagement (vigor, dedication, and absorption) and two dimensions of existential fulfillment (self-acceptance and self-actualization) among 167 nurses in a general hospital. Dedication was positively associated with self-transcendence, the ability to find meaning in life by being directed toward something or someone other than oneself (Frankl, 1992). In addition, workload was negatively associated with vigor and dedication. Palmer et al. (2010) reported a positive association between all three dimensions of nurse engagement and self-transcendence among 84 acute care nurses attending a nursing conference.

The antecedents of nurse engagement have also been investigated. Simpson (2009) reported a significant positive relationship between work engagement and overall job satisfaction and a negative relationship between work engagement and turnover cognitions and job search behavior. Multiple regression analysis indicated that two elements of job satisfaction (professional status and interaction at work) and one element of turnover cognition (thinking of quitting) explained 46% of the variability in work engagement. Results of a study by Laschinger, Wong, and Greco (2006) indicated a positive relationship between empowerment and nurses' perceived fit with six areas of work life (workload, control, reward, community, fairness, and values). These six areas of work life explained 42% of the variance in work engagement.

With so many positive outcomes and relatively few studies to date, nurse engagement is an excellent topic for future research. Determining levels of nurse engagement in the variety of settings in which nurses work, ascertaining other antecedents of nurse engagement, and establishing interventions to promote nurse engagement warrant further investigation. Examination of the relationship between nurse engagement and patient outcomes is also justified.

In summary, engaged nurses are those with a positive and satisfying emotional state while working that is characterized by vigor, dedication, and absorption. Nurse engagement is positively associated with existential fulfillment, self-transcendence, job satisfaction, and empowerment and is negatively associated with increased workload, turnover cognitions, and job search behavior. Health care and nursing administrators could benefit from attention to these findings. In addition, nurse engagement should be considered a worthy topic for further exploration.

Beth Palmer

NURSE-LED GROUP CLINIC VISITS

Group clinic visits are defined as clinic-visits-shared appointments with more than one patient, all facing the same common medical conditions. The nurse-led group clinic visits model is focused on patient self-management and education aimed at improving health care services access, improving interactive patient-to-patient and patient-to-provider discussion, and promoting patient satisfaction (Bartley & Haney, 2010; Watts et al., 2009). The role of the advanced practice nurse (APN) in the group clinics includes providing physical examinations, managing polypharmacy or other treatment-related issues, and integrating care across multiple providers. In some clinics, the APN facilitates multidisciplinary health professionals' group discussions with patients to address self-management of their identified problems (Watts et al., 2009). Physicians involved in shared group clinic visits spend significantly less time (up to 65% less time) with patients than they do when seeing the same number of patients in individual clinic visits. Notably, patients in group clinic visits had up to 35% longer face-to-face interaction with the multidisciplinary health care team providers than did those in individual clinic appointments (Bagley, 2000). The nurse-led group clinic visits model enhances patients' level of engagement in collaborative care by providing extensive patient education and self-management guidance, promoting patients' interaction, promoting social support, sharing problem-solving strategies, and reducing health care costs (Jaber, Braksmajer, & Trilling, 2006). Thus, the group clinic visits may benefit patients with chronic illnesses that require frequent follow-up and continuous self-management education due to the complexity of chronic illness care.

At group clinic visits led by an APN, patients can be actively involved in problem solving to overcome common barriers, such as modifying dietary choices, improving adherence to medications, and timely reporting of symptoms (Harrison et al., 2002; Kasper et al., 2002; O'Connor, 2001). One recent pilot group clinic visit for patients with heart failure (HF) found improvement of patients' HF knowledge at 8 weeks' follow-up after the group clinic visit (Yehle, Sands, Rhynders, & Newton, 2009). Another study reported improvement in patients' depression and self-care management index score at 6 months, and there was a 20% increase in the use of prescribed medications (Lin, Cavendish, Boren, Ofstad, & Seidensticker, 2008).

Group clinic visit methods of health care delivery are now being widely promoted by the American Academy of Family Physicians, as part of their Practice 2010 initiative and by the American College of Physicians' Innovations for practice management (American College of Physicians, 2005;

Henry, 1997; Houck, Kilo, & Scott, 2003; Jaber et al., 2006). Further, the Centers for Disease Control and Prevention has included this model in its collaborative effort to improve diabetes care in federally funded health centers (Bodenheimer, 2003).

Despite the support by these and other organizations for the use of group clinic visits, few clinical trials describing patient outcomes of group clinic processes exist (Lapp, 2002; Musley, Sokoloff, & Hawes, 2000). Wagner et al. examined primary care group visits for patients with diabetes (Glasgow et al., 2002; Wagner et al., 2001). Compared with traditional single-patient clinic visits, group visit participants reported better diabetes education, improved overall health status, fewer emergency center and specialty physician visits, and lower costs of care, and they received more preventive care services with greater screening for diabetic neuropathy.

In a Kaiser Permanente study, 294 elders with chronic illness were randomized to usual care or monthly group visits led by the patient's primary care physician (Scott et al., 2004). Group clinic visit participants, compared with traditional clinic visit patients, experienced significantly fewer hospital admissions and emergency center visits and reported higher satisfaction with their physician and greater quality of life. In another study of poorly controlled type 2 diabetes patients, group clinic visit patients (vs. usual care patients) had clinically significant reductions in total cholesterol/HDL ratios (>32%), HbA1c (>30%), and health care costs (>7%) (Scott et al., 2004). Individual clinic appointments use more physician time and result in significantly poorer patient adherence to prescribed regimens, less problem solving, fewer resource recommendations, and no group or community support when compared with group appointments (Terry, 2000).

Nurse-led group clinic visits can be provided at low cost, even in clinical settings providing intense HF management, such as nurse-run HF specialty clinics (Smith, 2006, 2008; Watts et al., 2009). In a current trial, findings demonstrated that HF group clinic visits were provided at less cost than the allowable reimbursement from the Centers for Medicare & Medicaid Services for one group education visit (Smith, 2006). In addition, all of the HF group clinics were evaluated highly and attended regularly by patients and caregivers. Additional observation data showed reduced depression, extensive patient problem solving, and supportive exchanges with multidisciplinary professionals (Bowden, Piamjariyakul, & Smith, 2008). Content analysis of all group clinic discussions identified the following predominant topics for problem solving of common HF self-management issues: low-salt diet, HF medications, monitoring of weight, reporting of symptoms, and depressed moods. All national clinical guideline information for HF self-management by the American College of Cardiology and American Heart Association was discussed (Jessup et al., 2009). At the group clinic visits, patients readily shared emotions and talked with health care professionals about their mood and financial concerns. Patients' interactions and emotional and social support of one another in group discussions were observed across all sessions. The inclusion of an advanced practice mental health nurse as an integral part of the multidisciplinary health care team in the group clinics allowed for differential assessments of fatigue and insomnia, grief and situational depression, as well as anger and regret reactions that might have otherwise been inadvertently mislabeled as depression. Patients were more likely to disclose mental health illnesses, private family issues, and illicit substance use to the mental health nurse. These topics were left unreported to investigators in the clinical trial self-report study questionnaires (Bowden et al., 2011).

Postintervention evaluation data revealed patients' (n = 251) consistent, long-term use of effective step-by-step problem-solving algorithms resulted in greater collaboration with health care professionals

(Piamjariyakul, 2008; Piamjariyakul, Schiefelbein, & Smith, 2006; Smith et al., 2005). Thus, these evidence-based nurse-led interventions are expected to improve self-management and adherence and reduce rehospitalizations (Smith et al., 2003).

The nurse-led group clinic visits health care delivery model is well accepted by patients and professionals (Bartle & Haney, 2010) and third-party payers (American Academy of Family Physicians, 2010). Given the escalating prevalence, devastating symptoms and morbidity, and high costs of chronic illness care, it is imperative that interventions with the potential for improving self-management and clinical outcomes efficiency be tested across illness populations. Further study related to the costs of group clinics led by APNs could provide evidence for managing multiple chronic diseases in outpatient settings.

Ubolrat Piamjariyakul
Carol Smith

NURSE AND PHYSICIAN INTERDISCIPLINARY COLLABORATION

Nursing and medicine are irrevocably connected together for the care and cure of patients. The traditional roles and values of each profession have frequently limited interprofessional relationships and made successful collaboration difficult to achieve. The historical divide between the disciplines and the dominance of the medical model has resulted in the creation of hierarchies that have not fostered the development of collaborative partnerships (Baldwin, 1996; Williamson, 2003). Historically, nurses and physicians have frequently practiced independently, preventing the formation of partnerships and the collaboration necessary for providing safe patient care (Kohn, Corrigan, & Donaldson, 2000). Real and perceived differences in power and role misunderstanding contribute to the barriers which impede the formation of effective nurse–physician relationships. The increasing complexity and changes in health care delivery in recent decades have contributed to the challenge of establishing positive nurse–physician collaborative relationships. Economic, societal, and business drivers have served to influence the health care delivery environment in which nurses and physicians provide patient care. Technological growth and an increased emphasis on specialization have also impacted the development of collegial nurse–physician relationships (Chaboyer & Peterson, 2001).

A number of historical factors have influenced each profession's roles and responsibilities, including education and socialization which have at times created conflict and disagreement. The barriers to effective collaboration between nurses and physicians are associated with differences in communication style, gender stereotypes, role ambiguity, and incongruent expectations (LeTourneau, 2004). To practice successfully and in the interest of safe patient care, positive collaborative relationships between nurses and physicians must occur. According to the Institute of Medicine, "Health care is a decade or more behind other high risk industries in it's attention to teamwork and collaboration to ensure basic safety" (Kohn, Corrigan, & Donaldson, 2004, p. 5). Relationships between nurses and physicians have frequently been characterized as strained and contentious (Rosenstein & O'Daniel, 2005). Ineffective nurse–physician collaborative relationships have been linked to adverse patient events, medication errors, and patient mortality (Page, 2004).

Nurses and physicians define collaboration differently and also rank its presence in the same interactions differently. Factors underlying changes in the nurse–physician relationship include the increase in the number of female physicians and male nurses, the increase in the public's level of awareness of disease management and outcomes, the transition of nursing education from hospital based to the university level, and the decline of public esteem for physicians. Increased nurse specialization, the expansion of nurse practitioner and clinical nurse specialist roles, and participation in independent and collaborative research have resulted in enhancing the image and value of nurses as collaborators. Increasingly, more nurses and physicians value interrelationships concerning working and learning together and the manner in which the relationship can mature and develop (Schmalenberg, Kramer, & King, 2005). Nurse–physician collaboration, however, is not commonplace in the majority of health care organizations (Barrere & Ellis, 2002).

Collaboration and teamwork initiatives have been identified as an integral component of quality health care with a number of positive outcomes including improvement in patient care, enhancement in professional nurse and physician satisfaction, increased productivity and efficiency, and reduction in health care costs (Kohn et al., 2000; Powell & Hill, 2006). Effective collaboration can help to create a supportive environment and develop a sense of success and establishment of an esprit de corps and interprofessional cohesiveness which can result in an improvement in productivity, increased employee and patient satisfaction, and optimally an improvement in patient care outcomes.

Barriers to effective nurse and physician collaboration exist in an array of health care settings. Role ambiguity, perceptions of power differentials, degrees of respect, autonomy, and perceptions of decision making were reported to contribute to barriers in nurse–physician collaborative relationships (Castledine, 2004; Chaboyer and Patterson, 2001; Fairbanks, Bisantz, & Sunm, 2007; Resnick & Bonner, 2003; Rosenstein, 2002; Thomas, Sexton, & Helmreich, 2003). Breakdowns in communication between nurses and physicians have recently been identified as the primary root cause of wrong-site operations and other sentinel events according to the Joint Commission on Accreditation of Healthcare Organizations (2007).

Nurse–physician relationships are evolving in significant ways. A number of historical factors have influenced each profession's roles and responsibilities, including education and socialization which have at times created conflict and disagreement. Nurses and physicians are now becoming equal partners in the clinical domain and are moving away from the traditional relationship with its significant disparity in power and influence. The current environment and challenges of health care require mutual interdependence of nurses and physicians which can guide the way to true collaboration and teamwork (Boyle & Kochinda, 2004; Horak, Pauig, Keidan, & Kerns, 2004; Zwarenstein & Bryant, 2004).

To practice successfully and in the interest of safe patient care, positive collaborative communication between nurses and physicians must occur. Nurses and physicians bring different perspectives to patient care. Placing value and understanding on the unique contributions of the other disciplines role can result in a discovery of their mutual goals and ability to effectively collaborate, with the patients' well-being as the primary focus. The challenge for health care organizations is to identify collaborative strategies that enhance communication, promote positive nurse–physician collaboration, and produce positive patient outcomes. The majority of research that has been performed on nurse–physician collaboration has been conducted by nurses. Physicians have not examined nurse–physician relationships to the same extent which may demonstrate a perception that relationships are collegial. A number of national initiatives have identified the importance of promoting interdisciplinary collaboration in education and shared competencies. The increased emphasis on collaboration has resulted in the inclusion of interdisciplinary collaboration in some nursing and medical curricula. Shadowing programs where residents shadow nurses have recently been adopted in residency programs in an effort to enhance increased understanding, communication, and respect. In addition, health care organizations have adopted teamwork initiatives promoting interdisciplinary collaboration and have identified specific patient care outcomes to measure and evaluate collaboration.

Further research directed towards evaluating the success of collaborative teamwork endeavors could be aimed at evaluating the degree of patient, nurse and physician satisfaction, and improved patient care outcomes. Finally, the development of positive collaborative relationships can provide an opportunity for nurses and physicians to develop innovative approaches and assist them to reconnect with values that initially attracted them to health care.

Tara C. Prescott

NURSE STAFFING

Staffing is the process of allocating employees to accomplish an organization's purpose. In the case of nursing, it refers to the deployment of nursing staff to achieve the operational goals of health care organizations, high among these is meeting the care needs of the organization's clients. Nurse staffing levels, the measurable endpoint of the process, are typically thought of in terms of either (a) ratios of staff to patient or staff to service volume that establish a level of coverage or attention patients receive in a setting or (b) proportions of staff providing care in a setting who hold specific qualifications, such as specific levels of licensure or registration, degrees, or certifications.

One of the major drivers of cost in health care, beyond the exception of the physical plant, equipment, and supplies, is, of course, human resources. Institutions offering 24-hour services, such as hospitals and long-term care facilities, can face quite high costs for nursing personnel, and acute care hospitals, where clients tend to require highly intensive and skilled care, are particularly dependent on the labor of registered nurses. However, community-based and ambulatory clinics and services may also require considerable numbers of staff. Many nurse practice settings are commonly characterized by high volumes of client care and a wide variety of client needs, especially across various clinics, care units, and departments. Attempts to increase efficiencies within health care organizations by using only needed personnel without overstaffing or understaffing have led to the development of nursing workload measurement systems to collect and analyze patient-specific information about care needs in specific work groups over time.

For health care managers, staffing decisions are of interest because of the financial implications of human resources costs for their agencies. However, all stakeholders in the health care system, including clinicians and patients and their families, as well as managers, find staffing to be of concern because of the potential clinical consequences of staffing decisions for patients (e.g., quality and safety outcomes).

Although statistical associations between nursing ratios (such as RN-to-bed ratios) and acute care hospital patient outcomes have long been identified in the broader health services research literature, these were often incidental findings embedded in studies focused on hospital or physician characteristics (Aiken, Clarke, Sloane, Sochalski, & Silber, 2002). After the publication of the Institute of Medicine's (1996) landmark report declaring both a dearth of evidence and the need for a research agenda in this area, scholarly activity in the staffing–outcomes field peaked in the early years of the millennium. Financially driven organizational restructuring in acute care hospitals in many Western countries in the 1990s involved experimentation with staffing configurations, including decreased staff-to-patient ratios and increased use of non-registered nurse personnel. Concerns about deteriorating working conditions and potential impacts of staffing changes on patient safety drove interest in studying connections between staffing levels and patient outcomes at this time. The analysis of Kovner and Gergen (1998), which linked higher RN staffing coverage in U.S. acute care hospitals to lower surgical complication risks, was a landmark publication in this area in terms of both methods and findings.

Most scholars in the field conceptualize staffing as a structural element within Donabedian's structure–process–outcomes framework, assume that staffing levels reflect management decisions, and in their recommended solutions, presume that resources exist to supplement low staffing levels as needed. However, staffing decisions are clearly also made in relation to operational demands, financial constraints, and local labor market forces, as well as preferences and traditions in a particular setting. Also left implicit are the pathways or mechanisms through which staff coverage or qualification mixes could impact outcomes; these mechanisms are generally believed to affect the amount and skill of nursing care provided to care recipients.

The body of empirical findings related to staffing outcomes comes largely from American hospitals, with the heaviest concentration of the literature dealing with outcomes of adult medical–surgical acute care inpatients, although a variety of populations have been studied and a subset of the literature pertains to long-term care facilities. The main outcome variables tied to staffing have been mortality and complications, and the most consistent findings relate to coverage of acute care hospitals with registered nurses rather than staff mix, although mixed findings for other outcomes have been identified. An intriguing body of findings related to the educational composition of the registered nurse workforce in hospitals (notably the proportion of nurses holding bachelor's degrees) has emerged, beginning with Aiken, Clarke, Cheung, Sloane, and Silber (2003). Staffing research designs remain principally correlational and cross-sectional in nature, with few exceptions (for instance, Mark, Harless, McCue, & Xu, 2004).

Research on nurse staffing and its outcomes in hospitals is complicated by the scarcity of reliable and valid staffing data in sufficient quantities and at reasonable cost to allow the examination of the relationships, as well as by the availability of outcome variables of acceptable methodological quality and of potential sensitivity to nursing care (e.g., symptom management). Methodological considerations in this area of research are discussed extensively in several reviews, including Clarke and Donaldson (2008) and Mark (2006). The formal study of mechanisms or pathways linking staffing levels (either ratios or staff mix statistics) with clinical outcomes has been very limited, raising the possibility of confounding variables as an explanation for the observed associations and heightening doubts in some that maintaining high levels of staffing or shifting staffing upwards will ensure better outcomes.

Policy implications arising from nurse staffing research have been controversial. Recommendations have included requiring monitoring and public reporting of staffing levels, outcomes potentially sensitive to staffing, or both. Others have claimed that this literature demonstrates that staffing levels have sufficient public health implications to warrant close regulation by governments, for instance, in the form of minimum mandated staffing ratios. Still, others have argued that the evidence clearly indicates preferred directions for state and national policies around the funding of nursing education.

Staffing researchers, like others in areas of nursing health services research, will likely increasingly examine the multiple simultaneous factors impacting on client outcomes in nurse practice settings. The findings of the staffing–outcomes research literature that low staffing levels tend to be correlated with risks of poor outcomes, albeit imperfect, are consistent with the contention that avoiding low levels of coverage and staff mix relative to norms for similar care settings is a necessary, but not sufficient, condition for minimizing adverse outcomes in nursing care. Management, leadership, and intradisciplinary and interdisciplinary teamwork in clinical practice settings have been repeatedly raised as important moderating factors influencing the effectiveness of staffing models, but formal study has been limited at present. Expansion of staffing investigations to also encompass the delivery of chronic care, particularly in the community, as well as outcomes across longer episodes of care are important research directions.

Staffing is destined to remain an active area of research, although the focus will likely change. Cost considerations are becoming increasingly prominent in most health care systems internationally. Further turbulence in the nursing workforce is expected, with deep and widespread regional and often national shortages of professional nurses expected in many societies before the end of the current decade. Although randomized trials of staffing models in various practice settings would be extremely difficult to develop from methodological, practical, and ethical standpoints, close longitudinal evaluations of carefully developed models of meeting client needs using different coverage levels and combinations of staff are possible and very much needed for effective local and national policymaking. Such evaluations will require better data on a broader range of outcome measures than are currently conventionally used in managing health care facilities research, as well as the capacity to link and analyze these data alongside staffing parameters.

Sean P. Clarke
Raquel M. Meyer

NURSING ASSESSMENT

Assessment is widely recognized as the first step in the nursing process. Nurses use assessment to determine patients' actual and potential needs, the assistance patients require, and the desired outcomes to evaluate the care provided. There is consensus that nursing assessment is crucial as the starting point for establishing relationships and for determining how patients and nurses will subsequently interact. Assessment begins with the initial nurse–patient encounter; it involves validating information previously obtained and collecting additional information to plan care. It is an important basis for determining which interventions can be delegated to other providers. Information collected includes social and health history data, which come directly from patients, and physical assessment data, which are derived from physical assessment techniques and diagnostic studies.

The purposes of assessment are to begin to establish a therapeutic relationship and to identify the patients' strengths and problems to determine appropriate interventions. Both the process and content of assessment are important. Process includes using communication and physical assessment skills to establish a relationship and to gather needed information. The important content will vary with the patient but generally includes physical assessment, other diagnostic data, assessment of the meaning of the health experience, quality of life, symptoms, and cultural factors that may affect health.

Florence Nightingale was among the first to discuss nursing assessment (Nightingale, 1860/1969). She believed that observation was essential, and she provided specific guidance about nursing assessments. Nightingale noted that the best process for interactions (including assessment) was to "always sit down when a sick person is talking business to you, show no signs of hurry, give complete attention and full consideration . . . Always sit within the patients' view" (pp. 48–49). Nightingale also advocated obtaining detailed and useful assessment data—for example, reporting the number of hours a patient slept rather than an opinion about how well the patient slept. This is best achieved by cultivating good interviewing skills (e.g., avoiding leading questions and eliciting descriptive responses from patients).

Assessment begins the nurse–patient relationship and determines how the nurse and patient will work together. Considerable research has been conducted on factors that influence interpersonal relationships. Several classic works in nursing have dealt with the process of establishing these relationships, including the roles in nursing at various phases in relationships and the importance of observation and communication, including use of self-disclosure and empathy, in establishing relationships (e.g., Peplau, 1952).

Communication is essential in assessment and is both the means for nurses and patients to influence each other and the process that leads to therapeutic and supportive influences on patients' health. Patients' successful communication of their needs to nurses is vital to individualized care. Individualized patient care has been found to produce more favorable outcomes and to reduce the cost of health care (Attree, 2001).

Although assessment and communication skills have been taught for decades, many studies have found that nurses have difficulty facilitating communication and that the patients' perspective is not adequately elicited. A variety of factors are associated with poor communication, including increased patient volume, lower nurse-to-patient ratios, and lack of attitudes, desires, confidence, and skills needed to effectively communicate (Raica, 2009). Nurses have also been found to be confused about the purpose of nursing assessment. Observations have found that nurse–patient interactions are superficial, routinized, and task related and that nurses create barriers in communication. Patients with complex communication needs present additional challenges (Finke, Light, & Kitko, 2008).

Surveys of nurses revealed that most had received training in communication skills, felt they were fairly effective in using these skills, and felt that the skills are important to their jobs. However, they also thought they needed and were willing to receive additional training. Communication training programs have had mixed results, including that benefits did not persist, that changes were limited, and that nurses taught communication skills did not improve in their ability to elicit and identify patient concerns despite increased use of the skills learned. The Study to Understand Prognoses and Preference for Outcomes and Risks of Treatment (SUPPORT) was a striking example of a communication intervention that did not improve outcomes (Lynn et al., 2000).

Physical assessment skills are routinely included in nursing curricula. They include (a) a general survey of patients' appearance and behaviors; (b) assessment of vital signs, temperature, pulse, respiration rates, and blood pressure; (c) assessment of height and weight; and (d) physical examination to assess patients' structures, organs, and body systems. Physical assessment can be complete, assessing all of the persons' organs and body systems, or modified to focus only on areas suggested by the persons' health history or symptoms.

Perceptions of symptoms and quality of life are important areas for assessment. Both symptoms and quality of life are primarily subjective experiences, influenced by many factors but knowable primarily through patients' descriptions of their experiences. Moreover, symptoms that are not properly managed can be life threatening.

Nurses need to explore the meaning of illness from patients' perspectives to help patients mediate between the medical role of fighting disease and the patients' perspectives (Steeves, Cohen, & Wise, 1994). The link between meaning making and the experience of illness and treatment may help elucidate important nursing interventions that can assist patients in meaning making in ways that are helpful to coping with their experiences and symptoms (Kleinman, 1988).

Understanding experiences of illnesses, disability, and treatments of members of diverse cultures is important but currently limited. Many have argued for the need to understand clients' lived experiences and their interactions to provide quality nursing care (Cohen & Palos, 2001). Producing unbiased and culturally appropriate knowledge is both important and complex (Cohen, Phillips, & Palos, 2001). This knowledge is important because those from diverse cultures may differ in ways that profoundly affect their health, what we need to assess, and the interventions that will be effective.

Despite consensus about the importance of understanding patients' perspectives, patients' descriptions show a consistent and persistent discrepancy between their views of their health care experiences and professionals' understandings of these experiences (e.g., see Lule et al., 2009). The meanings that patients attribute to their experiences help determine what needs they have and how these needs can best be met. Since action is based on meanings, common meanings between nurses and patients will provide the most effective base for helpful nurse–patient relationships. Research indicates that nurses need to understand patients' perspectives to deliver effective nursing care but that often, nurses assume they know what patients need without eliciting patients' actual concerns. Effective assessment is the essential basis for providing effective nursing care.

Marlene Zichi Cohen
Anita J. Tarzian

NURSING DIAGNOSES, INTERVENTIONS, AND OUTCOMES: NANDA-I, NURSING INTERVENTIONS CLASSIFICATION, AND NURSING OUTCOMES CLASSIFICATION

Efforts to build a knowledge base that supports professional practice and improves quality of care provided by nurses in a variety of settings across the health care continuum are ongoing. Essential to this knowledge base are knowledge of nursing diagnoses, patient outcomes, and nursing interventions (Lavin, Meyers, & Ellis, 2007). The need for standardized nursing languages (SNL) has been discussed in nursing literature for the past four decades (Dochterman & Jones, 2003; Jones, 1997; Lange & Jacox, 1993; Keenan & Aquilino, 1998; Maas, 1985; McCloskey & Bulechek, 1994; McCormick, 1991; Salive & Archibald, 1992, 1993; Zielstorff, 1994). Today, this need is even greater because of the challenge of developing and implementing electronic clinical information systems to support health care in the United States and globally (Brokel & Heath, 2009).

Three standardized terminologies recognized by the American Nurses Association provide language to facilitate the use of SNLs in practice, education, and research. These terminologies are the diagnoses developed by NANDA International, the interventions of the Nursing Interventions Classification (NIC), and the outcomes of the Nursing Outcomes Classification (NOC). Abdellah (1969) believed that nursing diagnoses were the foundation of nursing science. The use of SNL began in the 1970s with the formation of an organization, the North American Nursing Diagnosis Association, and the development of a diagnostic classification. This greatly changed practice and initiated a new era in nursing and a modification of the nursing process to five steps. A nursing diagnosis is "a clinical judgment about individual, family or community responses to actual or potential health problems/life processes. A nursing diagnosis provides the basis for selection of nursing interventions to achieve outcomes for which the nurse is accountable" (NANDA International, 2009, p. 410). In 2009, the NANDA-I classification included 202 diagnoses, organized into 47 classes and 13 domains. A multiaxial system has been used to improve the flexibility of the taxonomy and facilitate the addition of new or modified diagnoses (NANDA International, 2009).

Efforts to develop a vocabulary and classification of nursing interventions began in 1987 with the formation of a research team at the University of Iowa led by Joanne McCloskey Dochterman and Gloria Bulechek. The team developed the NIC, first published in 1992 as a comprehensive, standardized classification of interventions that nurses perform (McCloskey & Bulechek, 1992). In contrast to a nursing diagnosis or patient outcome in which the focus of concern is the patient, the focus of concern with nursing interventions is nurse behaviour, and each intervention lists actions that assist the patient to progress toward a desired outcome. A nursing intervention is defined as "any treatment, based upon clinical judgment and knowledge that a nurse performs to enhance patient/client outcomes. Nursing interventions include both direct and indirect care; those aimed at individuals, families, and the community; and those for nurse-initiated, physician-initiated and other provider-initiated treatments" (Bulechek, Butcher, & Dochterman, 2008, p. xxii). The 542 interventions in the fifth edition of NIC are grouped into 30 classes and 7 domains for ease of use (Bulechek et al., 2008).

The NOC is a comprehensive, standardized classification of patient/client outcomes developed to evaluate the effects of nursing interventions. Standardized outcomes are necessary for documentation in electronic records, for use in clinical information systems, and for the development of nursing knowledge and the education of professional nurses. An *outcome* is defined as "a measurable individual, family, or community state, behavior or perception that is measured along a continuum and is responsive to nursing interventions" (Moorhead, Johnson, Maas, & Swanson, 2008, p. 30). The outcomes are developed for use in all settings and can be used across the care continuum to follow patient outcomes throughout an illness episode or over an extended period of care. The strength of this classification is its use of measurement scales and the ability of the nurse to calculate a change score from admission to discharge. These scales have been tested in clinical practice and are highly reliable for measuring change in the patient's status. There are currently 385 NOC outcomes organized in 31 classes and 7 domains in the fourth edition (Moorhead et al., 2008).

The history of standardized language development mirrors the development of the nursing process. The first major issue was to challenge the use of the term *diagnosis* as a term only physicians could use. The early days of diagnoses development was controversial even within the nursing profession, but the importance of developing problems that nurses treat was viewed as critical to knowledge development in nursing. These early efforts by nurses who were members of the North American Nursing Diagnoses Association identified the need for classifications focused on nursing interventions and patient outcomes to be used with nursing diagnoses. Today, the issues continue to focus on making the content of these classifications robust and useful in practice. The need for representation and classification of the knowledge base of nursing continues to be an issue for the profession (Kautz, Kuiper, Pesut, & Williams, 2006). Research to validate the NANDA-I diagnoses and NOC outcomes is needed to ensure their usefulness across patient populations and care settings. In addition, clinical tests of the effectiveness of the nursing interventions are also needed to refine the NIC classification. Updating and enhancement of each of these classifications is a continuous endeavor to keep them current. Information on how to submit and outcome or intervention is available in the latest editions of NIC and NOC. Scroggins (2008) clearly described the process to submit a new or revised nursing diagnosis to NANDA International.

In addition, there is a great need for nurses to be educated on how to use these classifications. Most students are now introduced to these languages in their educational programs, but many nurses in practice need to learn these classifications and use them in their practice. This is a challenge for most health care organizations. Nursing data that have eluded our profession for years are possible to collect using these classifications. Nurses can then collect and analyze nursing data to improve practice. Many nurses continue to use these classifications in a paper care planning format because vendors have been slow to develop products that clearly support nursing practice in an electronic format. The advent of an electronic health record that serves nursing needs for data is essential to our practice.

Nursing classification development efforts have their foundations built on concept development methods. These methods can be used by any discipline to refine the concepts of interest (Avant, 1900; Lunney, 2009; Rodgers & Knafl, 2000; Walker & Avant, 1988). Other methods used to develop these classifications have been a combination of inductive, deductive, qualitative, and quantitative approaches (Bulechek et al., 2008; Maas, Johnson, & Moorhead, 1996; Moorhead et al., 2008). For the development of nursing diagnoses, common approaches include content validation (Fehring, 1987) for refining or developing new diagnoses, construct, and criterion-related validity to establish the stability and coherence of the concepts. This can be studied using reliability, epidemiological, outcome, causal analysis, and generalizability studies (Parker & Lunney, 1998). Currently methods that test the linkages of these classifications with specific populations of patients linking diagnoses, outcomes, and interventions can be used to refine the knowledge base of nursing. For example, a recent study by Head et al. (2011) identified the nursing diagnoses, interventions, and patient outcomes for older adults hospitalized with pneumonia. In addition, effectiveness research in nursing requires the use of standardized nursing concepts for nursing diagnoses, outcomes, and interventions. Guidelines for conducting effectiveness research have been published by Titler, Dochterman, and Reed (2004). The classifications can be used with many of the current nursing theories as a framework for providing care. Examples of these applications can be found in the literature (Farren, 2009; Kumar, 2007).

The use of nursing standardized terminologies is critical to nurses being able to evaluate practice across health care settings and specialties. The nursing profession has been developing terminology to describe nursing diagnoses, nursing interventions, and patient outcomes for a relatively short time in the history of nursing. We are at a critical point in the development of nursing science and our knowledge base. Classifications such as the NANDA International Classification of nursing diagnoses, the NOC, and the NIC are important to the continued development of our profession.

Sue Moorhead

NURSING EDUCATION

Three hospital training programs, modeled on the work of Florence Nightingale in the United Kingdom, were established in the United States in 1873. In 1907, a Department of Nursing and Health was initiated at Teachers College, Columbia University, to provide graduate-level leadership for the preparation of nurse tutors, faculty, and administrators (Dock, 1912). As early as 1915, the National League of Nursing Education called for the education of nurses at the university level. This was reinforced by the Committee for the Study of Nursing Education in the Goldmark (1923) report and other important reports on nursing education (Brown, 1948). Nursing education entered the university setting in 1923 with the establishment of programs at Yale University and at Case Western Reserve University, the first schools of nursing in the country to have an independent status among the schools and colleges of a university. These early developments led to nursing education both as a training program controlled by the hospitals and an academic program within the university setting.

From the turn of the century until the 1960s, nursing leaders often obtained their graduate preparation in schools of education. Consequently, most major developments that took place in schools of education were rather quickly transferred to nursing curricula. The influence of Ralph Tyler at the University of Chicago had a major impact on nursing education. His emphasis on learner objectives and curricular structure is still evident, but in the 1980s, there was a renewed focus on the nursing curriculum as a humanistic endeavor, where "caring" and not behavioral objectives formed the core of the content (Watson, 1988).

Licensure is required to practice nursing in each state. Until 1944, each state board of nursing developed its own testing mechanism to license nurses. Today, the National Council of State Boards of Nursing has jurisdiction throughout the United States and its territories. The National Council of State Boards of Nursing sets standards for requirements and regulations for schools of nursing and licensure of new graduates, but the authority for requirements and regulations rests at the state level. All states have agreed to use the same licensing examination to facilitate the mobility of the nursing workforce in the United States.

Currently, there are three types of educational programs to prepare students for licensure as registered nurses (RN): baccalaureate degree (bachelor of science in nursing), associate degree (associate degree in nursing), and diploma programs. Bachelor of science in nursing programs, including accelerated options for second-degree seekers, are currently offered at 765 schools in the United States. On the graduate level, 495 master's programs and 178 doctoral programs are available nationwide. In 2009, there were 214,533 nursing students enrolled in baccalaureate programs, 77,146 in master's programs, and 9,342 in doctoral programs (American Association of Colleges of Nursing [AACN], 2010a). As of 2010, there were more than 800 associate degree in nursing programs and only a small number of diploma programs operating in the United States (Bureau of Labor Statistic, 2010).

In 2009, there were 14,595 full-time faculty members in nursing programs offered in 4-year colleges and universities. The faculty members in these programs were 11.5% minority and 5.1% male (AACN, 2010b).

As of 2008, there were 3,063,162 RNs in the United States, and these nurses were 93.8% female and 83.2% White (non-Hispanic), and 84.8% were employed in nursing (Health Resources and Services Administration, 2010). Their level of education is as follows: 13.9% diploma, 36.1% associate degree, 36.8% baccalaureate, and 13.2% master's or doctoral degree (HRSA, 2010).

Nursing has many professional organizations, and even with this complexity, it has successfully developed a unified position in dealing with federal issues that affect nursing education and patient care. The vehicle for cooperation is the Tri-Council, made up of representatives from four major nursing organizations: the American Nurses Association, the American Organization of Nurse Executives, the National League for Nursing, and the AACN. The AACN, headquartered in Washington, DC, is an organization composed of collegiate schools of nursing. It conducts annual surveys of faculty salaries, faculty workload, and similar topics of primary interest to deans and directors of programs.

The American Nurses Association provides a voluntary credentialing mechanism that recognizes both RNs who are involved in advanced practice and those who are generalists practicing in a specialty area.

E. Smith (1979) defined *continuing education* as postregistered learning activity designed to increase knowledge or skill or to challenge attitudes. Several states now require varying amounts of additional education for relicensure. Moreover, some states (including Michigan, Idaho, Utah, and Minnesota) require competency-based continuing education.

Research on topics related to nursing education has been very comprehensive and has examined many different areas, including quality of education, care planning, clinical judgment, clinical decision making, clinical teaching, learning styles, performance on licensing examination, faculty productivity, simulation based instruction, socialization processes, teaching learning processes, competencies, and many others.

In January 2010, Dr. Patricia Benner issued a landmark report for the Carnegie Foundation for the Advancement of Teaching titled *Educating Nurses: A Call for Radical Transformation.* As a result, the Tri-Council for Nursing issued a policy statement on the *Education Advancement of Registered Nurses*, which underscored the connection between quality care and education. The Tri-Council organizations reached the following consensus: "a more highly educated nursing profession is no longer a preferred future; it is a necessary future in order to meet the nursing needs of the nation and to deliver effective and effective care." Taken together, these reports signal that the time is right for the profession to seek solutions for preparing more nurses in baccalaureate and higher degree programs.

With the recent release of the Institute of Medicine's report on the *Future of Nursing*, the national conversations regarding nursing education are accelerating. The Robert Wood Johnson Foundation in concert with the AACN is moving quickly to advance the recommendations and vision outlined in the report.

Jeanne Marie Novotny

NURSING INFORMATION SYSTEMS

Saba and McCormick (2005) described nursing information systems (NIS) as the use of technology and computer systems to collect, store, process, display, retrieve, and communicate timely data and information in and across health care facilities that

1. administer nursing services and resources,
2. manage the delivery of patient and nursing care,
3. link research resources and findings to nursing practice, and
4. apply educational resources to nursing education.

Today, there is a growing recognition of the value of integrated clinical information systems (CIS), where NIS exist as modules or applications within larger integrated systems to facilitate data entry, retrieval, and decision making by nurses and other interdisciplinary health care team members (Hasna, 2009). NIS are used to support nursing education, practice, and research. An NIS module is an application that supports the use and documentation of nursing processes and provides tools for managing the delivery of nursing care (Hebda, Czar, & Mascara, 2009).

Early information systems were often information silos, focused on financial transactions models, and were designed primarily to support charge capture, administrative, and operational transactions. With the increased introduction of computer technology in the health care industry, computer developers of the early hospital, medical, and patient care information systems began to expand their systems to include subsystems that addressed the documentation of nursing care. Then, the challenge was how to best computerize the existing paper-based methods of documenting nursing care in health care facilities to support nursing practice and patient care. Developers began by computerizing the standardized nursing care protocols or plans that focused on medical diagnoses, surgical procedures, or disease conditions. With the introduction of the microcomputer, NIS emerged as stand-alone systems for a specific nursing application for different aspects of nursing administration, practice, education, research, and community health. Such systems were designed by nurses who were becoming proficient in their design. Today, nurses continue to be involved in the design and development of NIS modules to support capture of nursing data at the point for care. However, the focus has shifted from replicating existing paper processes to practice redesign and leveraging information technology to support effective and safe patient care and to promote transformation of clinical data into information and knowledge (Androwich et al., 2003).

In 1996, the American Nurses Association established the Nursing Information and Data Set Evaluation Center to develop and disseminate standards pertaining to information systems that support nursing practice and to evaluate voluntarily submitted information systems against those standards. A number of models for viewing information systems have been proposed. One model, developed by Graves and Corcoran, focuses on the design of an NIS as the framework that represents the management processing of data, information, and knowledge. Zielstorff, Hudgings, and Grobe (1993) identified early system design requirements needed to support the nursing process including performance, flexibility, and connectivity, as well as user–machine interface, hardware, and data security and integrity requirements. They also believed it essential that the system would promote efficiency and effectiveness of care by supporting decision making by the nurse (Zielstorff et al., 1993). Androwich et al. (2003) emphasized that the information systems of the future must go beyond meeting basic information needs to support practice. They envision data, information, and knowledge available to the nurse as needed to inform every present clinical encounter and to provide and generate new knowledge to improve future encounters. Nursing Information and Data Set Evaluation Center identified four dimensions of nursing data sets and the systems that contain them: nomenclature (the terms used), clinical content (the "linkages" among terms), clinical data repository (how the data are stored and made available), and general systems characteristics (American Nurses Association, 2010).

NIS modules can be found in all areas where nurses function and in all settings where nurses provide patient care including hospitals, community health agencies, managed care organizations, ambulatory care facilities, and other settings. NIS modules in nursing administration are used primarily for the administration of nursing services and the management of nursing units. For the administration of nursing services, these information systems are designed to generate information focusing on budget, personnel, and resource management. The focus is on the specific applications needed to run a nursing department effectively and efficiently, such as staffing, scheduling, utilization, productivity, quality assurance, and discharge planning. To achieve full reimbursement for care provided, information systems are now required to meet criteria for "meaningful use" and include electronic documentation and data exchange across organizations (Westra, Subramanian, Hart, &

Matney, 2010). Systems designed for the management of nursing units focus on the patient care services and address nursing intensity, patient classification, acuity, decision support, and patient outcomes. These systems are used to track the care process during an episode of illness as well as measure the impact and outcomes of the care.

In the area of nursing practice, NIS modules within CIS are used to document care planning and patient care services and comprise the computer-based patient record. The major applications are order entry, results reporting, medication protocols, care planning protocols, patient education, quality assurance, and discharge planning systems. The system uses the point-of-care computer terminals to capture direct patient care and can support the care process with decision support systems. Well-designed systems focus on the integration of information and care by all providers and can be used for discharge planning and referral to community health agencies and home health care services for follow-up.

Much has been written about evidence-based nursing practice (Titler, 2007). However, the lack of adoption of content and messaging standards and variable adoption of CIS has constrained the ability of nurses to consistently apply evidence to practice and to build evidence from practice (Burkhart & Androwich, 2009). The design of "intelligent" CIS with sound NIS modules holds promise for transforming nursing practice (Lang, 2008) through their ability to present nurses with the information needed to provide the right care for the right patient at the right time (McClellan, McGinnis, Nabel, & Olsen, 2008).

In the area of nursing education, NIS modules form the technology that supports the education process, such as computer-assisted instruction, interactive video programs, and Web-based courseware for synchronous or asynchronous learning. They use a wide range of educational strategies that enhance and integrate nursing informatics into the educational process (Saba & McCormick, 2005). In 2007, over 100 leaders from nursing education, practice, industry, and government agencies gathered at a summit to create an action plan to ensure that the current and next generation of nurses are adequately prepared to engage in "the unfolding digital era of health care." The Technology Informatics Guiding Education Reform (TIGER) initiative aims to enable nurses to provide safe and effective care in the emerging digital environment. One of the main pillars of the TIGER vision includes informing CIS design to ensure that it is evidence based, interoperable, and supportive of nursing education and practice and fosters quality care and safety (TIGER, 2007).

NIS modules support the research process. Without such systems, nursing research cannot be accomplished on large-scale databases and population groups. NIS are needed to process and analyze research data that only a computer application can perform. Nursing research applications include searching the literature by using bibliographic retrieval systems containing nursing-related material. Other applications include classification systems needed to code, classify, process, and analyze nursing research data, as well as the instruments and tools used to conduct research: database management systems, file managers, spreadsheets, and statistical software designed to process research data. Other applications, such as graphic displays, text preparation, and editors, are designed to disseminate and communicate research findings and conclusions via online databases or the Internet. Research has been conducted on NIS modules since the 1970s. Early research focused on stand-alone systems for documentation, care planning, scheduling, and the development of standardized languages (Ozbolt & Saba, 2008). The nursing informatics research being conducted today builds on the work of the past several decades, with a strategic focus on harmonizing the numerous standards developed over the past 30 years to support evidence-based practice, knowledge generation (Bakken, Stone, & Larson, 2008; Ozbolt & Saba, 2008), and application of informatics methods and tools to improve the quality and safety of patient care (Brokel & Harrison, 2009; McCormick, Delaney, & Brennan, 2007). Moreover, current and future research trends are focused in the areas of patient preferences and patient-centered e-health. Examples include the use of Web-based technologies to engage patients as full-fledged members of the health care team (Bakken et al., 2008) and the use of telehealth and telecommunication technologies to improve care of the underserved (Cady, Finkelstein, & Kelly, 2009).

NIS modules represent the nursing informatics applications within CIS. While early NIS modules functioned as information silos, today they are integrated into interoperable CIS where data captured at the point of care are available to support the nursing process, decision making, and quality patient care across domains and settings. NIS modules are used in all major areas of nursing. Through involvement in designing and implementing NIS modules within CIS, nurses aim to preserve the unique function of basic nursing care which is essential to human welfare, while leveraging technology to enhance nursing practice.

Patricia C. Dykes
Ida Androwich
Virginia K. Saba

NURSING OCCUPATIONAL INJURY AND STRESS

An estimated 17 million people, about 11% of the U.S. workforce, are employed within the Health Care and Social Assistance (HCSA) employment sector. About 80% of these workers are in health care industries and 20% in social assistance industries (Department of Health and Human Services, National Institute for Occupational Safety and Health [NIOSH], 2009). Growth of the HCSA sector through 2014 is projected to be more than any other industrial sector, with about 4.3 million jobs (30%) or 1 out of every 5 new jobs (Berman, 2005). Home health care services is leading the growth in this subsector (nearly 70%) followed by residential care facilities (48%). About 80% of HCSA workers are women, a greater percentage than in any other industrial sector and nearly double that for all industrial sectors combined. Registered nurses, more than 2 million, constitute the largest occupation within the HCSA sector, of which 70% are employed in hospitals.

Although there are many commonalities between the occupational safety and health problems faced by health care workers and workers in other industrial sectors, such as exposure to hazardous chemicals, many of these risks and hazards are less visible and more unique to this field. Because more than 90% of those working in health care are women, adverse reproductive outcomes and responsibilities outside the workplace are of special concern. In addition, dealing with the highly complex patient care, exacerbated by traditional patterns of work organization including long or unpredictable work hours, rotating shifts, and understaffing, is very stressful.

The Bureau of Labor Statistics (BLS, 2005a) reported that the incidence rate of injuries and illnesses in the HCSA sector was 5.9 cases per 100 full-time workers, nearly 1.3 and 1.4 times higher than in private and service-providing industries, respectively. Most of these occurred in nursing and residential facilities and hospitals. The incidence of nonfatal occupational injuries for this sector was 5.5 cases per 100 full-time workers, compared to 4.4 and 3.9 cases per 100 full-time workers in the private and service-providing industries, respectively. The number of nonfatal injuries for this sector (624,000) accounted for 15.7% of the total number of injury cases in private industry. Nursing and residential care facilities had the highest incidence rate (8.7 cases per 100 full-time workers) with nearly 200,000 injury cases, followed by hospitals with an incidence rate of 7.5, and the highest number of injury cases (259,000) among the four subsectors (BLS, 2005a).

The incidence of nonfatal occupational illnesses for this sector was 39.9 cases per 10,000 full-time workers, compared to 26.7 and 19.6 cases in the private and service-providing industries, respectively (BLS, 2006a). Hospitals had the highest incidence rate (66.2 cases per 10,000 full-time workers) and number of reported cases (22,900), and nursing and residential care facilities accounted for the second highest incidence rate (40.3 cases per 10,000 full-time workers; BLS, 2005b).

Nurses provide numerous health care services in a variety of work environments that often are potentially hazardous. Depending on the nature of the work preformed, the type of hazard will vary. For example, a nurse anesthetist will have greater exposure to anesthetic waste gases, whereas an oncology nurse may be faced with antineoplastic drug exposure. Nurses are exposed to numerous hazards including biological, chemical, enviromechanical, physical, and psychosocial hazards. Exposure routes occur through inhalation, ingestion, or direct or indirect contact, and the type and degree of exposure will depend on the work setting.

A significant exposure route for biological agents such as blood-borne pathogens is via needlestick injuries, with an estimated 385,000 percutaneous injuries annually by hospital health care workers. Nurses may be exposed to more than 20 pathogens, of which the most commonly transmitted are hepatitis B virus, hepatitis C virus (HCV), and human immunodeficiency virus (HIV; Wagner et al., 2004). Sharps injuries and blood-borne pathogens remain an important issue in the health care sector. HIV, hepatitis B virus, and HCV are blood-borne pathogens of special concern because of their potential for occupational transmission and the severity of illness that they cause. There have been 57 documented cases of occupational HIV transmission among health care personnel, as reported by the Centers for Disease Control and Prevention, through December 2006 (Centers for Disease Control and Prevention, 2007). Based on the estimated number of percutaneous injuries per year and the average transmission rate, Sepkowitz and Eisenberg (2005) suggested that 50–150 transmissions of HCV would be expected each year. Thus, prevention of transmission in health care workers depends on prevention of sharps injuries and other blood and body fluid exposures. Although occupational transmission of blood-borne virus infection is a relatively rare event, unfortunately, sharp injuries continue to occur too frequently. Because hospital-based personnel only account for about half of all health care personnel, the total number of percutaneous injuries in this population may be considerably higher; only limited data are available to support an estimate that includes nonhospital-based personnel. Health care workers must also face unknown exposures, as they are routinely on the front line in caring for those with emerging infectious diseases, that is, severe acute respiratory syndrome, avian influenza, multidrug-resistant pathogens, pandemic influenza, or the emerging threat of bioterrorism, such as anthrax and smallpox.

Chemical exposure from medications such as antineoplastic agents and other substances, including disinfectants, sterilants, latex, and anesthetics, poses significant threats (International Agency for Research on Cancer, 2004; NIOSH, 2004a; Rogers, 2003). Drugs are classified as hazardous if animal or human studies indicate that exposures to them have a potential for causing cancer, developmental or reproductive toxicity, or other organ system damage. Most hazardous drugs are those used to treat cancer, but they also include other types of drugs such as antiviral agents. Workers may be exposed when they create aerosols, generate dust, clean up spills, or touch contaminated surfaces during the preparation, reconstitution, manipulation, administration, or disposal of treated patient waste or the hazardous drugs themselves (Connor & McDiarmid, 2006).

Although the clinical significance of exposure is unclear, evidence indicates that workers are being exposed to hazardous drugs and are experiencing serious health effects despite claims of compliance with current work practice guidelines. Sessink and Bos (1999) noted that 11 of 12 studies reported cyclophosphamide in the urine of health care workers, indicating continued exposure despite safety precautions. Recent studies continue to show various hazardous drugs in workers' urine, despite supposed compliance with safe handling procedures (Connor & McDiarmid, 2006; Rogers, 2003). Factors that affect worker exposures include the drug-handling circumstances (preparation, administration, or disposal); the amount, frequency, and duration of drug preparation; and the adherence to safe handling guidance including use of engineering controls, warnings, and administrative controls, safe work practices, and personal protective apparel and equipment.

Enviromechanical factors including heavy lifting and awkward postures can result in falls, lacerations, and disabling musculoskeletal injuries. Studies have indicated that nurses working for at least 1 year reported neck problems (45.8%), shoulder problems (35.1%), and back problems (47%) (Trinkoff, Lipscomb, Geiger-Brown, & Brady, 2002) and that nearly 80% of nurses experience low back pain during the course of their working life. In 2005, more than 20,000 recordable cases of back and other pain, carpal tunnel syndrome, and tendonitis were reported in the HCSA sector by BLS; of these, more than 42% were among health care support occupations such as aides and assistants (Silverstein & Adams, 2006). In 2005, the incidence rate of sprains and strains involving days away from work was 82.3 cases per 10,000 workers (BLS, 2006b). The health care patient was the most frequent cause of injury, at a rate of 47.5 cases per 10,000 workers.

Physical agent exposure in health care settings occurs less frequently. However, radiation exposure has been linked to cancer and reproductive toxicity, and eye and skin damage can result from laser exposure (Rogers, 2003).

Psychosocial factors such as organizational climate including interpersonal conflicts, caring for patients and their worried or grieving families, shift work, personal issues, and work-related violence can result in enormous amounts of stress leading to burnout, job turnover, and ultimately leaving the profession. In 2001, the American Nurses Association conducted a survey of 4,826 nurses from across the United States; 88% of those responding reported that health and safety concerns influenced their decision to remain in nursing and the kind of nursing work they chose to perform. More than 70% said that the acute and chronic effects of stress and overwork were one of their top three health concerns. More than two thirds reported being required to work mandatory overtime every month. Disabling back injury and fear of contracting HIV or hepatitis infection from a needlestick injury were also among the top three health concerns. Seventeen percent had been physically assaulted, and more than half were threatened or had experienced verbal abuse in the last year. Remarkably, less than 20% of respondents felt safe in their current work environment.

Poor match between organization of work and the capabilities, resources, or needs of workers can lead to a stress response; reduced time available for sleep, family, and nonwork activities; and longer exposures to occupational hazards (Hurrell & Kelloway, 2007; Rogers, 2003). These immediate effects can lead to mood disturbances; difficulty thinking; disturbed sleep; fatigue; pain; neurological, cognitive, and physiological dysfunction; and negative health behaviors such as smoking and substance abuse. This can result in a wide variety of injuries and illnesses for the worker as well as medical errors, shortages of health care workers, and automobile crashes while commuting to and from work.

Health care workers are often exposed to shift work and long work hours because their services are needed around the clock and because shortages of workers put pressure on those available to work longer hours. A large number of studies report an association between shift work and long hours and health and safety risks (NIOSH, 2004b). For example, disturbances may occur leading to reductions in the length and quality of sleep and may increase fatigue; sleepiness; worker errors; and gastrointestinal, psychological, and cardiovascular symptoms and disorders; breast cancer; and adverse reproductive outcomes (Megdal, Kroenke, Laden, Pukkala, Schernhammer, 2005). Long hours may also increase exposure times to workplace hazards and may reduce time available for exercise or nutritious meals.

Health care workers are at risk for verbal, psychological, and physical violence. Violent acts occur during interactions with patients, family, visitors, coworkers, and supervisors. Working with volatile people or people under heightened stress, long wait times for service, understaffing, patients or visitors under the influence of drugs or alcohol, access to weapons, inadequate security, and poor environmental design are among the risk factors for violence (Gerberich et al., 2005; McPhaul et al., 2006). The HCSA sector leads all other industrial sectors in the incidence of nonfatal workplace assaults. In 2006, 60% of the assaults and violent acts (by person) requiring days away from work occurred in HCSA and mainly involved assaults by health care patients (BLS, 2006b). The Minnesota nurses study documented an overall violence rate of 14.2/100 person-years; over 25% of nurses in the Veterans Health Administration study experienced at least one assault each year. In both surveys, occupations with closer physical contact with patients had higher assault rates than the rates of those with less contact. Emergency departments were associated with higher assault rates in one study, mental health and geriatrics units in the other than other areas. Better lighting, shorter working hours, and personal alarms (e.g., cell phones) were associated with lower assault rates (Gerberich et al., 2004; Hodgson et al., 2004).

Buerhaus (2005) found that more than 75% of RNs believe that the nursing shortage presents a major problem for the quality of their work life, the quality of patient care, and the amount of time nurses can spend with patients. Looking forward, almost all nurses surveyed see the shortage in the future as a catalyst for increasing stress on nurses (98%), lowering patient care quality (93%), and causing nurses to leave the profession (93%). In a report by the Bernard Hodes Group (2006), 55% of nurses surveyed reported their intention to retire between 2011 and 2020.

There are many areas ripe for research related to the numerous exposures nurses face every day while at work. Although a wide range of hazards exist, a key barrier to addressing them is the misconception that health care work is safer than other work involving exposure to chemical and physical hazards. We must continue to be vigilant about the work-related health hazards and put in place strategies designed to eliminate and mitigate these risks.

Bonnie Rogers

NURSING PRACTICE MODELS

A nursing practice model can be described as a guide, a road map, or a framework that provides a structure for the organization and the delivery of care. There have been several types of nursing practice models developed over time. They include administrative, theory-based, and transitions-based models. With the emergence of American

Nurses Credentialing Center Magnet recognition guided by Aiken's (2002) work, there has been a renewed attention to the development of nursing practice models in the clinical setting.

Nursing management and health care executives have worked to developed many administratively driven practice models that influence the delivery of nursing care. These administrative practice models have been developed in response to changes in health care and have incorporated dimensions such as interdisciplinary practice, differentiated practice, and communication as integral components of the framework. The goal of most of these nursing practice models focuses on fostering strategies that decrease cost, improve quality outcomes, increase nurse satisfaction, enhance professional autonomy, and control over practice and team work while decreasing conflict and fostering communication among disciplines. Ultimately, outcomes of effect not only increase satisfaction with the work environment but may also increase financial compensation and ultimately impact on patient satisfaction with care. Models of shared governance, professional practice, and collaborative governance reflect are examples of nursing practice models that foster these goals.

Shared governance is designed to increase nursing's presence in the health care system by differentiating responsibilities of providers based on education and experience while compensating expert practitioners financially. This model provides opportunities for shared decision making and organizational participation of care providers through committee work (Anthony, 2004). Evaluation of successful implementation and sustainability of this model over time has varied. Cost and commitment to the governance process have been issues, although evaluation reports indicate satisfaction with staff participation in decision making and teamwork. Some continue to use the model, whereas others have abandoned it for other structures.

Use of professional practice models (PPMs) and collaborative governance are examples of practice model, and these expand the concept of shared decision making. A PPM is designed to advance development, use, and translation of knowledge across disciplines to improve patient care outcomes; enhance nurse satisfaction; and acknowledge the contributions of all providers to deliver cost-effective, high-quality, safe patient care (Institute of Medicine, 2001, 2002). One example of a PPM has been developed, implemented, and evaluated at the Massachusetts General Hospital in Boston, Massachusetts (Ives Erickson, 1998, 2007). The model is based upon "the values, principles and beliefs that support the individualized work of each discipline" (Ives Erickson, 1998, p. 4). The current PPM contains nine elements. They include vision and values, standards of practice, narrative culture, professional development, patient centeredness, clinical recognition and advancement, collaborative decision making, research, and innovation and entrepreneurial teamwork. The professional practice environment (PPE) is evaluated regularly to assess staff satisfaction across disciplines. An instrument called the PPE survey (Ives Erickson et al., 2004) and the revised PPE survey (Ives Erickson, Duffy, Ditomassi, & Jones, 2009) were developed and tested as a measure of the staff's perception of the PPM.

The collaborative governance model focuses on the contribution of all professionals within the organization, including nurses and providers from across other disciplines and therapies. Collaborative governance is used to implement many of the components of the PPM. A committee structure is developed to involve staff from across disciplines to participate in the leadership of patient care services. Interdisciplinary team building is used to bring about change. Emphasis is placed on communication among caregivers and respect for each discipline's contribution to quality patient care. The model offers individuals who deliver patient care at all levels a voice in decision making through a committee structure and open forums. The goal of the model is to work toward increased recognition of all providers and as a result improve work satisfaction and enjoyment with the practice environment and patient care outcomes. Collaborative nursing practice models have been successful in directing resource utilization and staffing (Ives Erickson, Hamilton, Jones, & Ditomassi, 2003) and in enhancing staff participation in organizational decision making.

Theory-based practice models incorporate nursing and theoretical perspectives in and outside the discipline to guide practice. Some models have been implemented using midrange theories (e.g., symptom management, pain, and stress) to direct practice. Community-based practices have focused on public health models aimed at health promotion and protection, disease prevention, and risk reduction. The goal of these models is to decrease mortality rates and the myriad of health problems that follow including obesity, smoking cessation, drug prevention, and immunizations.

As the largest influence on nursing-theory-based care and professional practice modes, shared/collaborative models have been the clinical settings' desire to achieve American Nurses Credentialing Center Magnet designation. Magnet accreditation is a testament to high-quality nursing care. To be recognized as being Magnet certified, nurses in practice settings must embrace a theoretical framework, practice within a PPM, participate in organizational decision making and research, advance professional practice, provide the evidence to demonstrate high satisfaction with the professional practice environment, and describe strategies put in place by an organization that demonstrate a structure for continuous quality improvement through innovation and development. This goal has resulted in many nurses examining and discussing nursing theories and their use in practice. To this end, many nurses in many practice settings have embraced Watson's caring theory because it reflects the disciplinary perspective of meaning making and caring (Watson, 2008a). Research is ongoing, but some work is emerging that suggests both nurses and patients are satisfied with care delivered from this perspective (Flanagan, 2009). Continued inquiry is necessary to understand how nursing-theory-driven care, or in some settings knowledge-based practice, impacts other outcomes including patient safety, satisfaction, and feelings of being known as a person by the providers of care.

Transitional models of care reflect both nursing theory such as transitions (Meleis, 2010) and administrative models aimed at reducing cost and improving patient outcomes. Models with advanced practice nurses providing care throughout the transition from acute to home care enable patients to move rapidly from the acute care settings to a less costly care site at home (Naylor et al., 2004, 2009).

Use of various models to guide nursing practice helps to foster the philosophy, values, and beliefs of an organization. A nursing practice model can serve as a structure for the planning and direction of nursing and health care and help guide resource distribution. Strategic planning is improved as participation from all providers in organizational decisions can occur when nurses have a shared vision about health care. Through the use of nursing practice models, practitioners from beginner to expert can be recognized for unique contributions to care and for their educational and clinical expertise (Benner, 1984). Organizing care around a nursing practice model also can create a strong patient–family centric care environment, where providers can come to know the patient and use nursing knowledge to improve care outcomes. A PPM can help to expand nursing's leadership for patient care and foster those behaviors associated with patient, family, and community health. Through practice models, new strategies and nursing interventions can be generated and tested to expand nursing knowledge and inform clinical practice.

With the continued emphasis on health care reform, cost savings, and quality, it is essential that practice be implemented within a framework that is realistic and useful. For nursing, the continued creation of practice models will promote quality care and facilitate the articulation of nursing's contribution to care outcomes. Emerging practice models that are patient centered and respectful of the contribution of all providers will foster quality health care for all and initiate creative approaches to practice that can maintain and sustain individuals in less costly environments. Through teamwork, cooperative planning, and increased participation in decision making, system members can move the organization toward a shared vision and new directions in care delivery.

Dorothy A. Jones
Jane Flanagan

NURSING PROCESS

Nearly all authors define the *nursing process* as a problem-solving process composed of the elements of assessment, planning, implementation, and evaluation. Many a priori assumptions have been identified and studied concerning the nursing-process approach to patient care that includes decision making as a characteristic of the process. These assumptions are that the nursing process is a holistic, scientific, individualized, problem-solving approach with an emphasis on diagnosing.

Interest in the type of systematic identification of a nursing process spread rapidly, as evidenced in many proceedings, position statements, and policies from groups as influential as the American Nurses Association and the Joint Commission on the Accreditation of Hospitals. By the mid-1970s, there was widespread implementation underway. Early writings began to emerge in the literature at this time. Although little research appeared in publications, writings in journals and textbooks were abundant, promoting the process as a useful tool for teaching and understanding nursing. It was commonly held that full implementation of the nursing process would bring about radical changes in nursing education and nursing practice. In the late 1970s, the World Health Organization endorsed the use of the nursing process.

A large amount of the research conducted on the nursing process has come from the United Kingdom. However, studies on the implementation of the nursing process in both the United States and the United Kingdom reveal that nursing process has not been implemented. Researchers have attempted to identify and study what barriers exist to the full use of the nursing process as identified by educators and clinicians in both countries. Studies focused on the attitudes of nurses, environmental factors, educational preparation, strategies to promote and encourage use, and instrument development to measure the concept more empirically. The reports were very consistent in finding that nurses placed a high value on the nursing process as a vehicle to provide quality, individualized patient care, although they did not implement the nursing process regardless of their preparation and knowledge of the process or their educational level or years of experience. The data indicate that even those novice nurses recently educated within the nursing process did not use it in actual patient situations when providing independent nursing care.

There are problems with the evaluation and study of such a multidimensional concept as the nursing process. A review of the literature reveals few objective indicators or criteria to measure this concept. A variety of research designs and methodologies have been described in the literature primarily aimed at investigating the implementation or lack of implementation. Instrument development to measure the nursing process has been reported in the literature. Researchers have designed quantitative studies using such strategies as attitudinal questionnaires with complex analyses, intervention studies intended to compare group outcomes, retrospective studies, and questionnaires assessing documentation. Other research strategies to study implementation issues have been inductive in nature. Researchers have used extensive literature analyses on the subject, grounded theory approaches, action research, direct observation with field recording, and cooperative inquiry to describe and understand these phenomena.

There is a considerable amount of unpublished dissertation work in the United States addressing issues and concerns about educational variations, environmental impact, and barriers in attitude and structure to the full implementation of the nursing process. Intervention studies have attempted to influence attitude and behavior with motivational therapy, increased education through innovative teaching strategies and on-site inservice, and skills-reinforcement strategies.

Throughout the reported studies, a clear theme emerges. The profession of nursing holds a high value for the nursing process. There is a belief that the nursing process is the best vehicle to individualize patient care. Nurses verbally articulate this commitment and value on behalf of the profession and practice of nursing, but consistently, the data support the reality that nurses do not use the nursing process in practice and that the assumptions and characteristics of the nursing process are not supported as tested in a myriad of research approaches.

Researchers interested in this field in the future might take some direction from this review as well as from clinical judgment. There are strong indications that a scientific, analytical, systematic approach to patient care is of value to the novice student who experiences the complexities of the human condition in early training. However, equally supportive research indicates that more advanced students and practicing nurses revise and adapt the nursing process within the realities of practice. Some nursing process researchers, as well as those that study clinical judgment (decision making), call for a new model that reflects a more holistic approach to analyzing patient situations and arriving at individualized care that is open to multiple ways of knowing and the evolving contexts of the environment and the patient. One future direction might be generating theory-based practice models for individualized patient care and testing the effectiveness of these new process models. This research may contribute greatly to the new outcomes-focused initiatives shaping future nursing research.

Sally Phillips

NUTRITION IN INFANCY AND CHILDHOOD

Nutrition in infancy and childhood refers to dietary intake necessary to support optimal growth and developmental processes from birth through the school-aged years. Substantial research attention has focused on the role of nutrition in health promotion and disease prevention across the life course of infants and young children from diverse populations. Dietary intake is now recognized as a major component of health promotion and a modifiable determinant of numerous chronic diseases including hypertension, osteoporosis, type 2 diabetes, some forms of cancer, and coronary heart disease. Accumulated data indicate that many of these disease processes begin early in life and are influenced over time by potentially modifiable behaviors including patterns of dietary intake. Obesity, now recognized as a global challenge to the health of children, is the most prevalent nutritional disorder in childhood and adolescence and is linked with many of these chronic conditions. Nutrition has always been a cornerstone of pediatric primary health care; however, these collective diet-disease observations, primarily of adult populations, have placed increasing emphasis on preventive interventions beginning early in life.

Infancy is a time of rapid growth and developmental change in all domains including physical, cognitive, and psychosocial processes. Energy requirements during this period of the life course exceed others and are approximately 90 to 100 kcal/kg body weight/day. Recommended (or reference) intakes of most nutrients have now been established and appear to fulfill the unique nutritional needs of infants and young children. The Food and Nutrition Board of the National Academy of Sciences has provided estimated average requirement and adequate intake (AI) reference data for infants (birth to 6 months of age and 7–12 months of age), toddlers (1–3 years of age), and children of early school age (4–8 years). The currently recommended energy intakes are based on total energy expenditure measured by the doubly labeled water technique plus allowance for growth based on changes in body composition. These are about 15% lower than the previous recommended daily allowance established requirements. Sufficient fat for essential fatty acid requirements (0.5–1.0 g/kg/day of linoleic acid plus a smaller amount of alpha-linoleic acid) and sufficient carbohydrate to prevent hypoglycemia and/or ketosis are required (~5.0 g/kg/day). Controversy continues regarding the need for long-chain polyunsaturated fatty acid supplementation (for formula-fed infants). A recent evidence-based report to the Food and Drug Administration reaffirmed selected neurodevelopmental benefits associated with this supplementation; however, because results were not consistent across studies, infant formula manufacturers have the option to include long-chain polyunsaturated fatty acid.

The American Academy of Pediatrics (AAP) Committee on Nutrition (2005) recommends human milk as the ideal source of nutrition for the first 6 months of life. In situations where breast-feeding is not practical or desired, commercial formulas are recommended as the alternative form of infant nutrition. Recent AAP Committee on Nutrition (2005) recommendations reaffirm human milk or commercial formula as the primary milk source throughout the first year of life and discourage cow's milk, reduced fat, and evaporated milk. In addition, breast-fed infants should receive 400 international units of vitamin D daily and iron supplementation at 4 months of age.

Accumulated data indicate that the age of introduction of supplemental foods should not be rigidly specified; however, 6 months of age appears to be optimal for the majority of healthy term infants. AAP (2005) emphasized the introduction of single-ingredient foods, started one at a time at weekly intervals, to allow for the identification of food intolerance. Progression of feeding practices beyond this point may vary as a function of individual, family, cultural, and economic factors. Achievement of individual growth and developmental milestones, however, is universally recommended as a major determinant of nutrition throughout the first year of life (AAP, 2005).

Although significant advances in the art and science of infant nutrition have been made in the past two decades, many challenges remain. A continuing focal point for pediatric health care professionals is increasing the proportion of women who breast-feed in the early postpartum period and throughout the first 6 months of life. Breast-feeding has been listed as a continued goal from Healthy People 2010 to Healthy People 2020. The rates appear increased in some segments of the population: the goals are being revised for Healthy People 2020 to 85% at inception, 60% at 3 months of age, and 35% at 6 months of age. The prevalence of iron-deficiency has decreased in the past several decades;

however, data indicate that low-income, ethnically diverse infants continue to be a population at risk.

Recent research attention has focused on the relationship of infant nutrient intake and risk factors for adult-onset cardiovascular disease, the protective role of breast-feeding in prevention of childhood and adolescent overweight, and gene–diet interactions early in life. Answers to questions raised in each of these areas will assist in defining guidelines for preventive interventions relevant to dietary intake in early life.

The epidemic of overweight in children and adolescents in the United States and globally combined with the emphasis on the role of nutrition in health promotion and disease prevention has prompted several recent surveys of dietary intake in children and youth. Methodological differences make cross-study comparisons difficult to interpret; however, accumulated data indicate that dietary patterns of U.S. children are not consistent with recent recommendations. Data from the National Health and Nutrition Examination Surveys indicate that recommended intakes of vegetables and fruits are not being achieved and that fluid milk and whole grains as a percent of energy intake have decreased over time. Data derived from 24-hour dietary recalls (obtained by phone interviews with primary caregivers) of a nationally representative study of infants indicate that greater than 20% of infants and toddlers did not consume one fruit or vegetable in a given day (Fox, Pac, Devaney, & Jankowski, 2004). Sixty percent of infants (6–11 months of age) and 80% between 12 and 24 months of age, however, had at least one fruit drink a day. By 2 years of age, parents reported that 10% of total daily energy intake came from sugar-sweetened beverages other than fruit juice. In addition, french fries were the most common vegetable consumed; none of the top five vegetables consumed by those under 2 years of age was a green leafy vegetable. Other data indicate that the frequency of consumption of nutrient-poor, energy-dense snacks increases with age (Skinner, Ziegler, Pac, & Devaney, 2004; Ziegler, Briefel, Clusen, & Devaney, 2006) throughout the first years of life. Important in this context is that caloric intake has increased across all age groups, including infants and toddlers. Other data indicate that dietary patterns are more adverse including increased number of eating events per day (snacks), larger portion sizes, greater proportion of daily intakes consumed away from home, higher intakes on weekend days, and higher consumption of sugar-sweetened beverages. Collectively, these observations point to the importance of both high-risk and population-based preventive interventions focused on the determinants of children's patterns of dietary intake.

Numerous agencies have advanced dietary recommendations for children and youth. Recent recommendations reflect the state of knowledge regarding diet–health relationships and place emphasis on prudence and moderation in macronutrient consumption. While specific recommended daily allowances vary as a function of age and other individual factors, recent guidelines also emphasize increased consumption of soluble and insoluble fiber and decreased consumption of sucrose and sodium. The AAP Committee on Nutrition (2005) and the American Heart Association (2006, 2009) are consistent in recommending that children's diets should provide calories to support growth and developmental processes, maintain desirable body weight, and include a variety of foods. In addition, daily food intake should provide 25%–35% of total calories from fat, less than 10% from saturated fat, and less than 300 mg of cholesterol.

Pediatric health care professionals are faced with both challenges and opportunities in implementing these guidelines across health care settings. Translating provider-oriented dietary guidelines and recommendations for consumers of varying developmental, educational, and cultural backgrounds is a particular challenge. The

American Heart Association (2009) and the revised *Dietary Guidelines for Americans* 2010 (U.S. Department of Agriculture, Center for Nutrition Policy and Promotion, 2010) provide more specific recommendations on implementation. From a pediatric population perspective, numerous factors influence dietary intake including the contexts of family, school, and community (Gidding et al., 2009; Hayman et al., 2004; Popkin, Duffey, & Gordon-Larsen, 2005). Traditional, individualized approaches to dietary behavior change in children and youth have yielded varying results. Recent data support earlier observations and suggest an ecological approach to improving the nutritional status of U.S. children with efforts that extend beyond the individual level to the school and community environments. By definition, such interventions will be multicomponent, require a multidisciplinary team approach, and involve formulation and implementation of health policies on both local and national levels. With knowledge of nutritional science, human behavior, and experience and expertise across the continuum of health care, nurses and nursing are particularly well qualified to participate in these efforts.

Programs of nursing and multidisciplinary research focus on feeding practices and dietary intake in infancy and childhood; results to date have contributed to the existing body of knowledge in these areas of pediatric health care and have influenced clinical practice. Nurse researchers and scholars have also contributed to evidence-based scientific statements and guidelines designed to improve the nutrition of infants, children, and adolescents in clinical and community-based settings. As Kennedy (1997) observed, nursing research has contributed substantial information relevant to neonatal and preterm infant feeding. Nurse-initiated research focused on infancy and childhood has been primarily descriptive in design; however, nurses have contributed in various roles in multidisciplinary research that incorporated dietary interventions. Relevant programs of nursing research focused on promotion and determinants of breastfeeding in diverse populations include those conducted by Dr. Linda Spatz and colleagues at the University of Pennsylvania and Dr. Paula Meier at the University of Michigan. Drs. Mary and Marguerite Engler at the University of California–San Francisco have implemented a program of research focused on endothelial function and dyslipidemia in children with emphasis on the effects of antioxidants. Using a gene–diet–environment interaction paradigm, they are currently extending this research with inclusion of additional genetic determinants of cardiovascular disease. With emphasis on prevention and management of type 2 diabetes in children and youth, Dr. Margaret Grey and colleagues at Yale University include nutritional assessment and management as a major component of this well-established program of research. Finally, research in progress by Dr. Bernadette Melnyk and colleagues at Arizona State and Dr. Laura Hayman and a multidisciplinary team of investigators at UMass Boston and GoKids Boston is designed to modify patterns of dietary intake as part of multicomponent health promotion and weight loss interventions.

A major challenge for all nutrition and behavioral lifestyle interventions is maintenance of behavioral change over time. From a health-promotion and disease-prevention perspective, adherence to dietary recommendations continues to be a viable area for nursing and multidisciplinary research.

Laura L. Hayman
Alyson Karakouzian

NUTRITION IN THE ELDERLY

Research on nutrition in the elderly focuses on the older person's (aged 65 years and older) balance of nutrient intake, physiological demands, and metabolic rate (DiMaria-Ghalili, 2002) along a continuum from undernutrition to overnutrition. A nursing research agenda focusing on geriatric nutrition is essential due to the aging demographics of the U.S. population and the fact that most health care professionals are not adequately trained in assessing the nutritional needs of older adults (Institute of Medicine [IOM], 2008). Although obesity is the most common nutritional disorder in older adults (IOM, 2000), poor nutrition, undernutrition, and malnutrition are more serious matters. The unmet nutritional needs of obese older adults should be not be overlooked, as older adults with *sarcopenic obesity*, defined as the coexistence of diminished lean mass and increased fat mass (Miller & Wolfe, 2008), are particularly vulnerable to functional impairment and disability (Miller & Wolfe, 2008). Older persons are at risk for malnutrition as a result of normal aging and chronic disease, as well as dietary, economic, psychosocial, and physical factors (DiMaria-Ghalili & Amella, 2005). Twenty percent to 60% of older home care patients, 40%–60% of older hospitalized patients, and 40%–85% of older nursing home residents are malnourished or at risk for malnutrition (DiMaria-Ghalili & Amella, 2005).

Marasmus, kwashiorkor, and mixed marasmus–kwashiorkor originally described the subtypes of malnutrition associated with famine, and these terms eventually characterized disease-related malnutrition. An International Guideline Committee was organized to develop a consensus approach to defining adult (including older adults) malnutrition in clinical settings (Jensen et al., 2010). Inflammation is the cornerstone of the new adult-disease-related malnutrition subtypes and include starvation-related malnutrition (without inflammation), chronic-disease-related malnutrition (with chronic inflammation of a mild to moderate degree), and acute-disease- or injury-related malnutrition (with acute inflammation of a severe degree; Jensen et al., 2010). As aging is considered an inflammatory state (Franceschi, 2007), it is essential for researchers to incorporate inflammatory biomarkers in future nutrition studies.

By the year 2030, older adults will comprise 20% of the U.S. population, due in part to increases in life expectancy and aging of the baby boom generation (IOM, 2008). The new generation of elderly will be more racially and ethnically diverse (IOM, 2008); therefore, nurse researchers need to consider the impact of racial and ethnic attributes in future nutrition studies.

The economic impact of malnutrition is significant. For example, older malnourished hospitalized patients have longer lengths of stay and increased costs (Norman, Pichard, Lochs, & Pirlich, 2008). In addition, an older adult's personal economic standing may be a risk factor for undernutrition, especially if there is not enough money to buy food. In a recent report on Senior Hunger in America, marginal food insecurity was found in over 5 million seniors (Ziliak, Gundersen, & Haist, 2008). Of these, 2.5 million were at risk of hunger, and about 750,000 suffered from hunger due to financial constraints (Ziliak, et al., 2008). Food insecurity and hunger in older adults are projected to increase by the year 2025 (Ziliak et al., 2008).

Several contemporary practice perspectives underscore the significance of nutrition research in the elderly. In gerontology, malnutrition is a recognized geriatric syndrome, a clinical condition that does not fit into discrete disease categories (IOM, 2008). Frailty is also recognized as a distinct syndrome that can lead to disability (Fried et al., 2001). Malnutrition (Morley, Perry, & Miller, 2002) and unintentional weight loss (Fried et al., 2001) are contributing factors to frailty. Nutrition issues in older adults with advanced dementia center on eating and feeding challenges. The use of tube feedings in older adults with advanced dementia is ineffective (Sampson, Candy, & Jones, 2009), yet the practice continues (Teno et al., 2010).

Although the Joint Commission requires nutrition screening for all patients within 24 hours of admission, most hospitals rely on items extracted from nursing admission assessment, and these screens are not formally tested and validated in their setting (Chima, Dietz-Seher, & Kushner-Benson, 2008). A detailed literature review identified 21 tools used to assess nutrition in older adults by nurses (Green & Watson, 2006). Nurses need to develop evidence-based guidelines on the most age-appropriate nutrition screens to use in practice. In older adults, the Mini-Nutritional Assessment is considered to be one of the best tools to screen for malnutrition and risk of malnutrition across care settings (DiMaria-Ghalili & Guenter, 2008).

A major issue with malnutrition prevalence studies is that each study uses different nutrition measures, so there is no common denominator across studies. NutritionDay (www.nutritionday.org) is an international initiative, brought to the United States in 2009, in which hospitals and long-term care facilities screen nutrition status on adult patients, including the elderly, with the same tools to develop a cross-sectional malnutrition prevalence rate in participating institutions (Hiesmayr et al., 2009; Schindler et al., 2010; Valentini et al., 2009). Although the screens are not yet specific to the older adult, data from this initiative can potentially impact the clinical nutrition care older adults receive in hospitals and long-term care facilities.

In the community, many older adults receive home-delivered meals or go to congregate meal sites which are sponsored by funding from the Older Americans Act: Title III Nutrition Services Program. The Administration on Aging is formally evaluating Title III programs in regard to the program's impact on participants' nutrition, health and well-being, socialization, and food insecurity, in addition to an examination of program implementation at the state and local levels (Colello, 2010).

Nurse researchers continue to construct the theoretical and empirical perspectives on nutrition in older adults. Nurses have explored nutritional issues in older adults with chronic obstructive pulmonary disease (Odencrants, Ehnfors, & Ehrenberg, 2008; Odencrants, Ehnfors, & Grobe, 2005), dementia (Lou, Dai, Huang, & Yu, 2007), heart failure (Bennett, Welch, Eckert, Oldridge, & Murray, 2006; Lennie, Moser, Heo, Chung, & Zambroski, 2006), post cardiac surgery (DiMaria-Ghalili, 2002, 2004, 2008a, 2008b; DiMaria-Ghalili, Sullivan-Marx, & Compher, 2010), and in acute care (Chen, Tang, Wang, & Huang, 2009; Poulsen, Rahm Hallberg, & Schroll, 2006). In addition, nurse researchers have contributed to an understanding of the nutritional status of elderly people in community residential houses (Wikby, Ek, & Christensson, 2006), residential aged care (Gaskill et al., 2008), homecare (Soini, Routasalo, & Lauri, 2006), geriatric rehabilitation units (Soderhamn, Bachrach-Lindstrom, & Ek, 2007, 2008), and long-term care (Chen, Lin, Hwang, Wang, & Chwang, 2007). Other researchers have focused on improving nutrition outcomes in nursing home residents (Crogan & Alvine, 2006; Crogan, Alvine, & Pasvogel, 2006; Crogan & Evans, 2009) and are including a cultural perspective by understanding the nutritional needs of Hispanic nursing home residents (Evans & Crogan, 2006). Contributions by nurse scientists enrich the knowledge on nutrition in community-dwelling older adults in the United States (Chen, Chang, Chyun, & McCorkle, 2005; Lee, Lee, Kim, & Han, 2009; Martin, Kayser-Jones, Stotts, Porter, & Froelicher, 2005, 2007), China (Han, Li, & Zheng, 2009), Korea (Jung & Shin, 2008), Japan (Iizaka, Tadaka, & Sanada, 2008), and Taiwan (Hsieh, Sung, & Wan, 2010).

In addition to descriptive studies, nurses are developing and testing nutrition interventions in hip fracture patients (Gunnarsson, Lonn, & Gunningberg, 2009; Olofsson, Stenvall, Lundstrom, Svensson, & Gustafson, 2007), in frail community-dwelling older adults (Odlund Olin, Koochek, Cederholm, & Ljungqvist, 2008), in rural community-dwelling older adults (Walker et al., 2009), and in residential care (Gaskill, Isenring, Black, Hassall, & Bauer, 2009). A body of work focuses on structure and process issues related to mealtimes in hospitals (Bryon, de Casterle, Gastmans, Steeman, & Milisen, 2008; Dickinson, Welch, & Ager, 2008; Xia & McCutcheon, 2006), feeding difficulties between nursing assistants and elderly residents with dementia (Chang & Roberts, 2008), and food and meal policies in nursing home residents (Kuosma, Hjerrild, Pedersen, & Hundrup, 2008). In one study, nurses were interviewed to determine ways to promote nutrition assessment in older adults by nurses (Soderhamn & Soderhamn, 2009). Also, nurse researchers explored the impact of the culture of nursing homes on the use of tube feeding in advanced dementia (Lopez, Amella, Strumpf, Teno, & Mitchell, 2010). Finally, nurses are exploring the eating behaviors (Amella, Grant, & Mulloy, 2008) and mealtime difficulties (Aselage & Amella, 2010) in older adults with dementia.

Nurse researchers are well positioned to develop the science of geriatric nutrition. Future research should incorporate a biobehavioral approach with the inclusion of inflammatory biomarkers, based on the new subtypes of adult-disease-related malnutrition. Although it is important to continue to describe the nutritional status of various cohorts of older adults in acute care, long-term care, and in the community, it is imperative to link the various levels of nutritional status to health outcomes. Targeted interdisciplinary interventions to improve nutrition and health outcomes need to be developed and tested. Finally, greater strides must be made to translate the evidence on nutrition in older adults to the bedside.

Rose Ann DiMaria-Ghalili

O

Obesity

Obesity is a chronic metabolic disease and is characterized by an accumulation of excess body fat caused by increased caloric intake and decreased energy expenditure (Lazarou & Kouta, 2010). It is a relatively new phenomenon that has increased dramatically over the past two decades and represents a rapidly growing problem to the health of populations. It is influenced by a myriad of factors and the primary modifiable contributors to obesity are often attributed to fast food consumption, sedentary lifestyles, and excess energy consumption (Sargent & Moore, 2009). Other contributing factors that have been identified as causative links are genetics, gender, aging, and environmental factors (Burns et al., 2009). The primary reason obesity is relevant to nursing practice is its relationship to health behaviors. Nurses have a vital role in health promotion and continue to be in a key position to empower individuals to take control over their health (Balsdon, 2009). This is the goal of health promotion and is considered an implicit part of nursing. The majority of nursing research on obesity has focused on children, adolescent, and adult populations although there is a small body of research undertaken on the older adult.

The prevalence of obesity is continuing to rise at an alarming rate in many parts of the world and is a major challenging public health issue. The latest projections of the World Health Organization (2010) indicate that globally in 2005, 1.6 billion adults were overweight and 400 million were obese, and that by 2015, 2.3 billion will be overweight and more than 700 million will be obese. Obesity is an emerging health care epidemic affecting virtually all age and socioeconomic groups (Meetoo, 2010). According to Li and Hooker (2008), childhood obesity has been identified as the foremost predictor of obesity in adolescence and is linked to adult obesity. There is clear evidence that if both parents are obese, 80% of their children will be overweight, with this risk being reduced to 40% if one parent is obese and if neither parent is obese this is reduced to less than 10% (Dina, 2008). This trend suggests that this generation will enter adulthood already obese or a risk of developing obesity-related diseases. They may have a shorter life expectancy than their parents because of the impact of multiple health complications. Challenges affecting pregnancy have been documented and maternal obesity affecting pregnant women contributes to a higher morbidity and mortality for both mothers and babies (Irwin, 2010). Prevalence of obesity among older people is increasing and presents many complexities for the obese elderly (Flood & Newman, 2007). In addition, it will become a larger problem because of the rapid growth of the elderly population worldwide.

The literature is filled with discussion on the serious consequences of obesity and the impact it has on health-related quality of life. Obesity is associated with an increased risk of several chronic diseases and life-threatening physical, social, and psychological health problems (Kremers et al., 2009). Gooren (2008) suggests that 80% of obese adults have at least one associated disease and 40% have two or more associated diseases, such as diabetes mellitus, cardiovascular disease, gallbladder disease, respiratory diseases, sleep apnea, and certain forms of cancers (endometrial, breast, and colon). Life expectancy of obese adults is lessened substantially than that of someone of lower weight because of health complications associated with weight gain (Fontaine, Redden, Wang, Westfall, & Allison, 2003). Psychological health consequences of obesity have been documented and range from social isolation, social withdrawal, social discrimination, poor self-esteem, negative self-image, depression and suicidal thoughts (Puhl & Brownell, 2003).

From an economic perspective, obesity appears to be responsible for a substantial economic burden and has a substantial impact on health care spending (Li & Hooker, 2010). Health and economic costs attributable to obesity will further escalate as the current generation of overweight children are likely to become obese adults. The economic costs are incurred primarily from expenditures from absenteeism from work because of disability and loss of productivity as a result of premature morbidity and mortality (Lightwood et al., 2009). Other economic costs are related to the costs of weight-loss programs, the human cost of shortening of lives, and the significant impairment of quality of life caused by obesity.

There is overwhelming evidence in the literature that obesity is widely articulated as a stigmatizing condition and society discriminates those who are obese. Research on weight stigma illuminates that this bias is powerful, pervasive, and difficult to change. Knowledge and opinions are often formed by our beliefs and people who express negative perceptions on obesity believe that obesity can be prevented and controlled by the person themselves. These explicit negative attitudes can have a detrimental effect on the quality of life of obese people and can inhibit and negatively influence these people accessing health services throughout their lives. Budd, Mariotti, Graff, and Falkenstein (2009) found in an integrative review that little evidence was found to suggest that attitudes of health care professionals toward obesity were negative. Encouragingly, the study found that although attitudes were still negative, they had improved over time. In a literature review conducted by (Brown, 2006), it is important to note that he found a paucity of nursing research had been undertaken on exploring nurse's attitudes toward obese patients. In contrast, he found that nurses do have negative attitudes and beliefs about obesity. Several nursing studies highlight the issue of the nurse's own body image or body size being identified as a variable influencing underpinning attitudes and beliefs (Hoppe & Ogden, 1997). This body of research strongly suggests that biased attitudes exist among nurses and have the potential to be destructive, which can affect the obese person's psychological well-being.

Although children have been the focus of much attention and research, older adults are also becoming overweight or obese at an alarming rate. Moreover, in older people, being overweight and obese exacerbates multiple diseases and leads to frailty, which can affect activities of daily living. Early identification of obesity in older adults will enable these individuals to engage in improved healthier lifestyles. Studies have found that obesity is linked with functional ability leading to decreased mobility, which can have adverse effects on the quality of life for older people. A number of longitudinal studies have investigated the possible association between obesity and declining mobility in the older adult. Most of these studies found that walking, stair climbing, and chair rise ability was compromised with obesity especially if the body mass index was greater than 35 kg/m^2, and obese women were at an increased risk of mobility impairment than men (Vincent, Vincent, & Lamb, 2010). A systematic review undertaken by Witham and Avenell (2010) reviewed the evidence of weight loss interventions designed to produce sustained weight loss in older adults. The researchers found that there is a lack of high-quality evidence to support the efficacy of weight loss programs in older people. Witham and Avenell concluded that in comparison with younger people, there appears a dearth of high-quality research undertaken aimed at reducing obesity in older adults. In view of the growing numbers of obese older adults, clearly there is a need for further research to be undertaken in this area.

To date, obesity-prevention programs have focused on the establishment of programs to promote awareness among the populations of the health hazards and means of controlling obesity. Apart from the use of general preventative information tools such as mass media campaigns, information booklets, leaflets, and posters, growing evidence suggest that preventive activities such as cognitive-behavioral interventions could be effective in changing and maintaining behaviors (Bachman, 2007). Given that the ultimate goal of health care is to improve patient health, increasing nurse's knowledge of obesity management is paramount. The literature suggests that education and training in obesity management for all health care professionals is the key to successful obesity prevention. However, few nursing studies have identified the complexities faced by nurses in relation the management of obesity or the impact of education training in obesity management. A study conducted by Ogden and Hoppe (1998) assessed whether two different educational programs changed obesity attitudes of practice nurses. The findings revealed that there was no difference in their attitudes, which were deep rooted and difficult to change, but the nurses reported the educational interventions had a positive impact on their practice. The difficulties in challenging health care professional's negatives attitudes to obesity are compounded by the lack of inclusion of education programs on obesity in undergraduate education programs and in continuing professional education programs for registered nurses. Education is the key to the development of excellence in nursing practice. Nurses must be educated to meet the challenges of the obesity epidemic and ultimately be able to care for patients who are obese or have obesity-related problems.

Reducing obesity is one of the greatest global public health challenges of the twenty-first century. Nurses have a key role in to play in the prevention, treatment and management of obesity (Visram, Crosland, & Cording, 2009). Obesity cannot be cured, but effective prevention and treatment strategies to effectively reduce and maintain a healthy body weight and to create lifestyle transformation for obese people must now become a major priority. Nurses are in the position to empower people through education and information giving on the risks of obesity and create environments that support behavior change and deliver behavioral weight management programs (Lazarou & Kouta, 2010). Despite recent developments in our understanding of obesity, to a great extent, research in this area is confined to children and adults and research studies have yet to explore obesity in the older adult context. Furthermore, greater attention needs to be paid to the development of public health policies and strategies to target obesity, which is where the challenge now lies.

Teresa Wills

OBSERVATIONAL RESEARCH DESIGN

Observational designs are nonexperimental, quantitative designs. In contrast to experimental designs in which the investigator manipulates the independent variable and observes its effect, the investigator conducting observational research observes both the independent and the dependent variables. In observational studies, variation in the independent variable may be due to genetic endowment, self-selection, or occupational or environmental exposures. Because of the myriad sources of bias that can invalidate naturally occurring events, rigorous designs and methods are required to minimize bias. Observational designs should not be confused with observational methods of data collection.

Observational designs are used when there is not enough knowledge about a phenomenon to manipulate it experimentally. Sometimes research involving human participants is restricted to observational designs because of the nature of the phenomenon; that is, experimental research is precluded for ethical reasons.

Observational designs include quantitative, descriptive studies as well as analytical studies that are designed to test hypotheses. Descriptive, observational studies provide a basis for further study by describing and exploring relationships between variables, informing the planning of health services, and describing clinical practice for individual clients or groups of clients. In contrast, analytic research is designed to test specific hypotheses to draw conclusions about the impact of an independent variable or set of variables on an outcome, the dependent variable under scrutiny. Observational designs are classified as longitudinal or cross sectional. In a cross-sectional study, all the measurements relate to one point in time; in the longitudinal approach, measurements relate to at least two points in time.

A cross-sectional study, sometimes referred to as a correlational study, is conducted to establish that a relationship exists between variables. The term *correlational* refers to a method of analysis rather than a feature of the design itself. Cross-sectional studies are useful if the independent variable is an enduring personal characteristic, for instance, gender or blood type. Cross-sectional studies are also useful for exploring associations between and among variables.

Longitudinal comparative designs are usually undertaken to explain the relationship between an independent variable and an outcome. One type of longitudinal, comparative design is referred to as a cohort study. Participants are measured or categorized on the basis of the independent variable and are followed over time for observation of the dependent variable. In a cohort study, it is established at the outset that subjects have not already exhibited the outcomes of interest (dependent variable). Thus, the time sequencing of events can be established. In other words, it can be demonstrated that the independent variable preceded the occurrence of the dependent variable.

Another type of longitudinal, comparative design is a case–comparison study, sometimes referred to as a case–control study. In this design, the flow is the opposite of a cohort study. Participants are selected and categorized on the basis of the dependent variable (the outcome of interest). The purpose of the study is to test hypotheses about factors in the past (independent variables) that may explain the outcome. Although case–comparison designs are not prevalent in the nursing research literature, they have great potential for studies of outcomes that occur infrequently. Furthermore, this design is very efficient because it is possible to achieve greater statistical power with a smaller sample size than in other types of observational designs.

Longitudinal comparative designs are also classified according to the time perspective of the events under study in relation to the investigator's position in time. A study is retrospective if, relative to when the investigator begins the study, the events under investigation have already taken place. A study is prospective if the outcomes that are being investigated have not yet taken place when the study is initiated. Various hybrid designs are also possible, referred to as *ambidirectional studies*; they combine features of both time perspectives (Aschengrau & Seage, 2008).

As in experimental research, observational research designs and methods are selected with the aim of minimizing bias. Bias refers to distortion in the result of a study. A biased study threatens internal validity if the distortion is sufficient to lead to an erroneous inference about the relationship between the independent and dependent variable. Potential sources of bias that can threaten the internal validity of observational studies are those related to selection, measurement, and confounding.

Selection bias is a distortion in the estimate of effect resulting from (a) flaws in the choice of groups to be compared; (b) inability to locate or recruit participants selected into the sample, resulting in differential selection effects on the comparison groups; and (c) subsequent attrition of participants who had initially agreed to participate, which changes the composition of the comparison groups.

Measurement bias occurs when the independent variable or outcome (dependent variable) is measured in a way that is systematically inaccurate and results in distortion of the estimate of effect. The major sources of measurement bias are (a) a defective measuring instrument, (b) a procedure for ascertaining the outcome that is not sufficiently sensitive and specific, (c) the likelihood of detecting the outcome dependent on the participant's status on the independent variable, (d) selective recall or reporting by study participants, and (e) lack of blind measurements when indicated.

Because of the lack of randomization in a nonexperimental study, uncontrolled confounding variables are a major threat to internal validity. Unless confounding factors are controlled in the design of the study or in its analysis, distortion in the estimate of effect will result. A confounding factor operates through its association with both the independent and the dependent variables. It can distort the results in either direction; that is, it can lead to an overestimation of the relationship between the independent and the dependent variables by producing an indirect statistical association, or it can lead to an underestimate of the relationship between the independent and the dependent variables by masking the presence of an association between the independent and the dependent variables. A distinction between confounding bias and other types of bias is that confounding may be correctable at the design or analysis stage of the study, whereas bias due to selection and measurement problems is usually difficult or impossible to correct in the analysis. Confounding can be controlled or minimized at the design stage of the study by restricting the study sample or by matching the comparison groups. At the analysis stage, confounding can be controlled or minimized by using a multivariable approach to the statistical analysis to adjust for the confounding factors or by examining the independent–dependent variable relationship within specified levels or categories of the confounding factors (stratified analysis). Confounding variables should not be confused with mediator and moderator variables.

In summary, observational designs are prevalent in nursing research because they are used to describe phenomena in early stages of knowledge development and provide a basis for designing experimental interventions. In addition, they are the only feasible approach to hypothesis testing when it is unethical to manipulate the independent variable. In the absence of randomization and manipulation, myriad sources of bias can influence observations and conclusions drawn from naturally occurring events; thus, rigorous observational designs and methods are essential.

Janet C. Meininger

OREM'S SELF-CARE THEORY

One of nursing's grand theories, Orem's Self-Care Deficit Nursing Theory (SCDNT), is a vital component of nursing's philosophical foundation. The impetus of the theory, to define a curriculum for practical nursing, led

Orem to recognize that effort needed to be exerted on the conceptualization of nursing and nursing's relationships to patient needs and patient care. Orem proposed that nurses should be expected to have specialized abilities that qualifies a person to nurse. She called these abilities *nursing agency*, which together with patient needs and patient abilities became the structure and focus of the SCDNT.

In 1952, working as a hospital consultant nurse with the Indiana State Board of Health, Dorothea Orem was concerned about the state to which nursing was evolving. Nurses were engaging in nursing practice but were not able to articulate what nursing was. "Nursing" of the patient provided a major part of patient care. A person becomes a patient because of a legitimate inability to care for himself or herself when recovering from illness or injury. One of the problems Orem evaluated was how patient care did not truly meet patient needs. The advances in medical and allied research and treatment changed the way nurses evaluated and planned patient care. A broader concept of patient care was necessary. The active participation of patients in their treatment would be required to successfully meet the changing perspectives of patient care. Understanding the care needs of the patient was the obvious starting point for Orem. "The act of nursing is practiced by 'doing for' the person with the disability, by 'helping him to do for himself,' and/or 'by helping him to learn how to do it for himself' " (Orem, 1956, p. 85).

This general nursing theory is accepted as a relationship between self-care agency and therapeutic self-care demands, distinguishing self-care deficit from dependent care. Orem deliberately selected the term "deficit" for this relationship to be interpreted as insufficient, not as a human disorder. The incapacity to meet demands of self-care reflects the fact that a need for nursing exists. Orem recognized an apparent discontinuity between patient care and patient needs. The concept that nurses had of their practice had not evolved at the same pace as had patient needs. The obvious starting point for Orem toward understanding the care needs of the patient was to define "What is self-care?" "When is nursing needed?" and "How do nurses provide nursing care?" The answers to these questions are derived from three interconnected theories central to the SCDNT: the theory of nursing systems, the theory of self-care, and the theory of self-care deficit. All three theories combined become one general theory of nursing, with self-care deficit as the most comprehensive and at the core of her ideas. The relationship between the three theories is described in the following way. In the theory of self-care, self-care is an activity initiated on one's own behalf in the interest of health and well-being. The theory of self-care deficit is the relationship between therapeutic self-care demand and self-care agency whereas self-care capabilities are not known or able to be met. The theory of nursing systems is the deliberate practice actions of nurses carried out to meet the therapeutic self-care or develop the patients self-care agency. This answers the questions about the nature of care and the nature of nursing.

The central concepts of Orem's theory consist of (a) self-care—caring for one's self to maintain life, health, and well-being; (b) self-care demands—varied degrees and kinds of care requirements needed at specific times or over a duration of time for meeting all of an individual's needs; (c) self-care agency—the power and capabilities to engage in self-care, influenced by external and internal factors; (d) nursing agency—the broad ability of nurses to perform nursing; (e) self-care deficit—the actions and demands needed for self-care that are greater than the person's current capability for self-care; and (f) conditioning factors—internal or external factors that affect an individual's ability to engage the kind and degree of self-care required (Orem, 2001). This view distinguishes self-care from dependent care and nursing care, in which the agent acts on behalf of another person.

However, the substantive theoretical and practical knowledge of self-care is the foundation for both dependent care and nursing care. From this theoretical view, it is essential that nurses have substantive knowledge about self-care and understand that human beings are both the focus of their actions and the agents of their actions (Orem, 1991). In conclusion, nurses use the self-care deficit theory of nursing to aid them in their practice. Many clinical studies have shown that implementing Orem's theory has a positive effect on patients, nurses, and health care organizations. Orem's seminal work, *Nursing: Concepts of Practice*, originally published in 1971, has been revised to its current sixth edition in 2001. Orem's book remains a standard, having been published in seven languages and implemented by nurses in over 19 countries.

Eileen Virginia Romeo
Mary Jo Devereaux

ORGANIZATIONAL CULTURE

Organizational culture is one of several concepts often brought to bear in studying the settings where nurses tend to work (such as hospitals and other health care institutions); it attempts to explain individual and group behavior in workplaces in terms of longstanding, shared, and generally implicit (as opposed to explicit) operating "rules." Organizational culture is a term used in social science approaches to the study of complex groups and workplaces that borrows and adapts from a core concept in anthropology referring to enduring systems of beliefs and customs (ways of being and doing) that guide interactions of a group's members with each other and with outsiders and that are transmitted from one generation of the group to the next. Schein's (1985) widely cited definition of organizational culture is "a cognitive framework consisting of attitudes, values, behavioral norms, and expectations shared by the organization's members." Organizational culture is often distinguished from organizational climate, a construct that also refers to the experience of working in institutions but which tends to vary over shorter time horizons and is often conceptualized and operationalized as having more of a personal and psychological component.

Schein (1985) writes of three levels of manifestations of organizational culture, each more challenging for the outsider to identify, yet each progressively is more unique and potentially useful in understanding how an organization functions: the artifacts or outward trappings of an organization, including the physical environment, that communicate the culture (e.g., the meanings embedded in architecture, design, uniforms) and the ways of accomplishing specific types of the work done by the organization (e.g., slogans). The second layer consists of shared values or what is prioritized and valued in the organization through the eyes of the group. On occasion, stated values may be quite different from the "real" values that guide decisions, rewards, and penalties. The third layer consists of the basic assumptions that are held by members of an organization and may take a great deal of patient observation and analysis to uncover. Many writers assume culture to be built over the course of years and thus believe that it is not particularly easy to change.

Two fundamental approaches to studying organizational culture include quantitatively oriented self-reports (questionnaires or surveys) and qualitative approaches (fieldwork approaches such as ethnography and content analysis of organizational "artifacts"). Organizational culture researchers must rapidly choose a stance in relation to the nature of the underlying phenomenon and the assumptions implicit in data collection strategies (i.e., whether culture can be captured by surveying members of an organization and aggregating their self-reports about their agreement with carefully framed statements; Martin, 2002).

Frost, Moore, Louis, Lundberg, and Martin (1991) and later Martin (2002) have described three approaches to the study of culture: (1) the integration perspective, which characterizes culture as an institution-wide consensus about values and approaches to work; (2) the differentiation perspective, which emphasizes subcultures within organizations that somehow form coherent wholes in organizational life (e.g., the cultures across different departments, clinical areas, and professional/occupational groups within an institution); and (3) the fragmentation perspective, which emphasizes tensions, paradoxes, and ambiguities among the different subcultures within an organization as a fundamental feature of organizational life. The integration perspective is an especially popular way of thinking about culture among practicing managers, including those in health care. However, critics argue that it fails to accurately capture the complexity of organizational life and at its worst, can be used to overemphasize the importance of charismatic leadership, and serves as a justification for the silencing of differences of opinion in organizations that merit exploration and discussion. Arguably, many of the ideas in more recent discourse in organizational behavior theory have not had a particularly strong influence on the practice-oriented literature or the education of managers. Integration perspectives have been largely absorbed by practitioners, perhaps because the concrete implications for leadership from differentiation or fragmentation perspectives are much less clear-cut.

Schein (1985) has written that because culture reflects the ways that an organization has adapted to its environment, there is no such thing as good or bad culture, simply cultures that are more or less suited to the challenges and imperatives dictated by certain environments. Seen this way, the implication for leaders is that it may be preferable to identify and draw upon aspects of a unit's or organization's culture that can facilitate desired change, rather than trying to change culture directly.

Over the past decade, health care organizations have been challenged to contend with pressures to increase efficiencies through interdisciplinary collaboration, to comply with national and international practice guidelines, and to become accountable for both quality and progress in quality improvement activities. Because conservatism, adherence to tradition, a local rather than national outlook, and strong profession-specific identities among workers have been key forces in the evolution of many health care facilities, such changes often represent a major shift.

Not surprisingly, managers and executives and ultimately scholars have turned to the culture concept to drive this work forward. Over the past decade, perhaps the most widespread use of the concept has been in the sense of "safety culture" (Agency for Healthcare Research and Quality, 2010; Nieva & Sorra, 2003). This term refers to aspects of organizational culture that guide decision making around institutional priorities related to safety, openness to adoption of best practices, and promotion of feedback loops where errors or near misses are used to guide team learning and change. Many leaders and researchers are especially interested in the potential effects of safety culture on health care workers' priority setting, willingness to speak up, and steadfastness in situations where compromises should not be made, as well as "correct" ways to handle situations where safety breaches occur. It is notable that a number of these skills and behavior patterns that are now being fostered run contrary to some deeply ingrained traditions (cultural elements) in health care.

In recent years, organizational culture has also emerged in the field of nursing research utilization (for a recent example, see Cummings, Hutchinson, Scott, Norton, & Estabrooks, 2010). Many would argue that quantitative approaches, driven by questionnaires and/or standardized, validated observational grids, can be useful in benchmarking organizations against each other over time. Benchmarking data can help determine the types of leadership approaches that will tend to work best in particular institutions or clinical areas to enable an organization or its subunits to adapt to its environment. In the case of stimulating lasting change in clinical practice driven by empirical findings, considerable investments of human resources in identifying relevant evidence, applying evidence to local realities, and executing the required planned changes are needed. A culture of evidence-based practice in a service organization is often shaped by university/college affiliations, which produce regular contact with research and researchers and increase the likelihood that managers and clinicians will be socialized into evidence-based practice as well as by the presence of organizational programs and mechanisms such as training programs, mentoring, research rounds, and integration of quality improvement activities within shared governance structures. A critical mass of grassroots interest in making the change is essential, along with a shared expectation for cooperation in the change process among health care team members. Not surprisingly, culture has been raised as a potential explanation for the differences in investments and the speed of diffusion of ideas across institutions and regions.

For some time, a popular understanding of "culture" within nursing has been as a variable with great potential to predict or quantitatively explain differences across units and institutions in terms of practices and clinical outcomes, along the lines of the staffing-outcomes literature. Similar research in educational, retail, and banking settings has attempted to predict organizational performance using elements of organizational culture (or climate) along with a variety of other characteristics. Results of quantitative research on culture as a predictor of outcomes have been disappointing, which is probably understandable given both the complexity of culture as a concept and the complex pathways that likely link culture to individual and group clinician behaviors and in turn to clinical outcomes. In the end, organizational culture and cultural factors may be better conceptualized in both quantitative and qualitative work as a mediating variable between organizational interventions and their effects (e.g., as a factor affecting the uptake and impacts of safety or quality initiatives or organizational redesign on actual clinical practice) rather than as an independent predictor of organizational outcomes.

Organizational culture organizes many observations and impressions of life in and across institutions. The challenge ahead is to strengthen its usefulness as a variable to explain, to predict, and to control organizational outcomes, whether in terms of its direct effects or its possible role as a mediator of other factors. This will require a more consistent exploration of its deeper rather than more superficial features, in combination with research on organizational leadership and leaders' impacts on attitudes, values, beliefs, and customs, and ultimately on individual and team behaviors in the workplace.

Sean P. Clarke
Raquel M. Meyer

ORGANIZATIONAL DESIGN

Organizational design is concerned with the configuration and coordination of structures and work roles that influence organizational performance. Health care organizations employ nurses to deliver care, and the extent to which an organization can accomplish its goals depends, in part, on how well nurses' roles are supported by organizational structures. Although a growing proportion of nurses in North America were used by hospitals after the Great Depression of the 1930s, nurses continue to work in diverse organizational types as the delivery of care shifts among public health, military, industry, long-term care, home care, and acute care sectors in response to sociopolitical, economic, geographic, technological, and epidemiologic trends.

The basis of organizational structure is the division and coordination of labor among organizational members to achieve a common purpose. When work activities are divided and assigned to formal, interdependent, and interrelated roles, the result is a social structure composed of individuals and work units. By delineating responsibilities and accountability for each role in the organization, a hierarchy or reporting structure with formal lines of communication is created. An organizational chart visually displays the formal relationships of the social structure. Organizational performance is typically evaluated in terms of effectiveness and efficiency (Hatch, 2006). Effective design enables each member to accomplish his or her assigned work activities while ensuring the overall integration of work flow across the organization. Efficiency is achieved by design that minimizes the use of organizational resources (e.g., materials, personnel, time) in accomplishing work.

In larger organizations, work activities that are divided among roles (e.g., job descriptions), teams (e.g., nursing care delivery models), and work units (e.g., nursing units or departments) must be coordinated to meaningfully direct group activity toward shared goals (e.g., volume, quality). Coordination mechanisms bring together and connect smaller work activities among individuals and work units. At the work unit level, coordination involves programming and feedback devices such as standardization of worker skills (e.g., mandated nursing certification), work content (e.g., nursing care map), work outputs (e.g., managed care objectives), or communication methods (e.g., electronic health record); hierarchical referral (e.g., consultation with nurse specialist); and mutual adjustment through informal communication (e.g., multidisciplinary patient rounds), direct supervision (e.g., preceptoring of new nurses), and boundary spanning activities (e.g., case managers). At the organizational level, the division and coordination of labor influences the degree of centralization and the organizational form. Centralization reflects the extent to which decision-making authority is concentrated at the top levels of the hierarchy versus dispersed down through the hierarchy (Hatch, 2006). In health care, clinical decision making is typically decentralized to front-line professionals, whereas corporate strategy rests with the executive team. Organizational forms (e.g., functional, matrix, and program) reflect a trade-off between differentiation by function (i.e., division of work by occupation) and integration by program (i.e., coordination of work around the delivery of products or services; Charnes & Tewksbury, 1993). Since the 1980s, health care organizations have increasingly shifted from functional to program forms to deliver services on the basis of client needs rather than occupational boundaries (e.g., nursing, medicine).

Modernist theories of organization design have focused on improvements to organizational performance and employee motivation. The rise of industrialism and large-scale manufacturing processes near the turn of the twentieth century saw the advent of three fundamental theories: bureaucratic theory, the Scientific Management School, and classic management theory. These early theories conceptualized the organization as a stable entity with a formalized structure and as a closed system isolated from its external environment. According to bureaucratic theory, organizations sought to achieve technical and economic efficiency using legal, rule-bound authority (rather than authority based on kinship or personality) among obedient and status-seeking workers (e.g., Weber, 1978). Using a bottom-up approach, the Scientific Management School proposed that because workers were reliable, predictable, and economically motivated, technical solutions such as time-and-motion studies and monetary incentives could be used to plan, to control, and to evaluate work flow and outputs (e.g., Principles of Scientific Management by Taylor, 2003). Classic management theorists, who were typically company executives, applied administrative principles using a top–down approach to divide and coordinate work activities among workers who were viewed as skilled and specialized technicians (e.g., Theory of Organization by Gulick, 1937). However, post–World War I labor markets were characterized by increasing activism and unionism (O'Connor, 1999). This gave rise to the Human Relations School, which emphasized the behavioral aspects and informal structures of organizations. Workers were perceived to be socially and psychologically motivated, thus necessitating democratic leadership practices to empower workers and gain their cooperation to improve performance (e.g., Participative Decision Making by Likert, 1961). After World War II, the processes (rather than structures) of organizations gained attention, and the organization was viewed as an open system that adapted to its external environment (e.g., Contingency Theory by Lawrence & Lorsch, 1967). Workers were viewed as semiautonomous agents acting within and across system boundaries to integrate interdependent system functions. In response to globalization and knowledge-based economies, management theory has increasingly focused on interorganizational phenomena and the dissolution of traditional organizational boundaries (e.g., international strategic alliances, virtual networks). The "boundaryless" organization, which emerged from postbureaucratic theory, is characterized by nonhierarchical, flexible, temporary, and continuously changing organizational membership, structures, and processes centered on projects rather than roles (Shamir, 1999).

In health care, organizational design research has mainly focused on the relationships between structures and outcomes at the organizational level, with less emphasis on processes and on work unit level analyses (Hearld, Alexander, Fraser, & Jiang, 2008). For example, hospital level analyses of nurse staffing over the past two decades have typically linked structural indicators (e.g., nurse-to-patient ratios) to outcomes without identifying the care processes at the individual and work unit levels that explain differences in care quality. The result is a black box that reflects "an unknown and often unknowable mechanism, process, or system which is judged solely by observing its inputs and outputs" (Park, 2007) and that offers little guidance for reorganizing the delivery of nursing services to varied clinical populations at the point of care. These large-scale staffing studies, which allowed for comparisons between organizations, used mainly cross-sectional research designs and were prevalent, in part, because of the availability and accessibility of secondary administrative data sets.

During the 1980s, the concept of "magnet" hospitals emerged in the United States, and research found positive associations between patient and nurse outcomes and visible and responsive nursing leadership at all levels in the organizational chart (i.e., hierarchy) as well as strong nursing professional identity characterized by primary nursing (i.e., division of work), nurse–physician collaboration (i.e., mutual adjustment), autonomous clinical decision making, and participative decision making about unit and organizational processes (i.e., decentralization; Scott, Sochalski, & Aiken, 1999). In response to economic downturns during the 1990s, health systems in North America and elsewhere underwent restructuring and reengineering of structures, roles, and coordination mechanisms to contain costs, to improve quality, service, and speed, and to address increasing patient acuity and demand for health care services. Professional nurse staffing and leadership positions were frequently eliminated, unskilled workers were introduced, and nursing services were shifted from acute to community care, resulting in intensified nursing workloads across all sectors. Health care studies during this period were mostly retrospective, focusing on the immediate aftereffects of redesign on outcomes for care recipients, employees, and organizations. A largely negative picture of the impact of restructuring on clinical, human resource, and organizational outcomes emerged, and prospective research on change interventions was minimal. In health care, concerns related to emergency preparedness and to clinical integration across settings and episodes of care to seamlessly manage chronic illness have also generated significant planning and coordination work across organizational and jurisdictional boundaries. In 2000, the landmark book *To Err Is Human* (Institute of Medicine, 2000) documented safety issues in the health care industry and spurred research on the basis of the science of human factors engineering to identify organizational structures (e.g., clinical pathways) and coordination mechanisms (e.g., teamwork) that prevent critical incidents. More recently, the Institute of Medicine (2010) published a report on the future of nursing that provides a framework for examining nursing care at the work unit level to identify the mechanisms that improve care and to reorganize nursing services to specific patient populations; from prospective intervention studies to systematically evaluate planned changes to nursing service delivery; and from longitudinal research designs to identify the temporal ordering of relationships (i.e., cause and effect) and long-term outcomes related to the sustainability of organizational design initiatives. Future investigations of organizational design would benefit from standardized instruments, indicators, and benchmarks to enable cross comparisons.

Sean P. Clarke
Raquel M. Meyer

OSTEOPOROSIS

Osteoporosis is defined as a systemic skeletal disease characterized by a decrease in bone mass and microarchitectural deterioration of bone tissue with a consequent increase in bone fragility and susceptibility to fracture (Waugh et al., 2009). Bone quality, a poorly understood factor, is thought to result from the bone's micro- and macrostructure, biochemical composition, distribution and integrity of material components within the bone, turnover, and microdamage accumulation. That a 50-year-old woman with low bone density has a much lower risk of fracture than an 80-year-old woman with the same bone density speaks to changes in bone quality (Kolata, 2003). Although there is no way to clinically measure bone strength, the most reliable test for diagnosis of osteoporosis is a bone mineral density (BMD) test (National Institutes of Health [NIH], 2010). BMD accounts for 70% of bone strength and is measured as grams of mineral per area. It is reflective of both peak bone mass and the amount of bone loss (NIH, 2001). BMD can decline slowly with age, making osteoporosis an insidious disease, often going undiagnosed until a fracture occurs.

Investigation by nursing related to osteoporosis is appropriate across the life span. Osteoporosis not only is the result of accelerated bone loss during aging but also develops because of suboptimal bone growth in childhood and adolescence. "Osteoporosis is a pediatric disease with geriatric consequences" (Drugay, 1997, as cited in Gueldner, Burke, and Smiciklas-Wright, 2000). Prevention of osteoporosis, early detection, use of pharmaceutical management, and restoration or maintenance of function in those who have the disease are all consistent with nursing's focus on the human response to disease as well as the meta-paradigm: person, environment, health, and nursing. There are many questions that arise within this framework to guide the investigator.

The NIH estimates that 50% of women and 25% of men will suffer an osteoporosis-related fracture in their lifetime, costing an estimated $14 billion in direct expenditures (NIH, 2010). Currently, it is estimated that 10 million Americans have osteoporosis, whereas up to 33 million have low BMD and osteopenia and are at risk for osteoporosis (Knudtson, 2009). Of those 10 million, 8 million are women and 2 million are men (National Osteoporosis Foundation [NOF], 2010). Ethnicity is also a factor, with Caucasian and Asian women at highest risk for osteoporosis and Black and Hispanic women at lower risk (NIH, 2010). Fractures related to osteoporosis occur more frequently than myocardial infarctions, stroke, and breast cancer combined. As the U.S. population ages, the projected economic impact of osteoporosis-related fractures continues to rise (Knudtson, 2009). Genetics and age are the major nonmodifiable risk factors for osteoporosis, but lifestyle contributes to relative risk of developing osteoporosis. Diets low in calcium, lack of sun exposure, smoking, excessive alcohol intake, and sedentary lifestyle are some of the modifiable risk factors long identified with osteoporosis (NIH, 2010).

Although osteoporosis most commonly occurs in elderly men and women, it can also develop because of secondary causes (Knudtson, 2009). Medications such as glucocorticoids and medical conditions such as Cushing's disease, anorexia nervosa, and malabsorption can contribute to osteoporosis. Pregnancy-associated osteoporosis is a rare and temporary condition that occurs during the third trimester or postpartum period of a first pregnancy. Symptoms include back pain, loss of height, and vertebral fractures. In certain cases, pregnancy-associated osteoporosis can contribute to pelvic pain and hip or pelvic fracture (Spinarelli et al., 2009).

The NOF (2010) recommends dual-energy x-ray absorptiometry (DEXA) to measure BMD. The World Health Organization's definition of osteoporosis is based on the BMD of the hip or spine compared with the mean density of the normal young adult (NOF, 2010). A BMD score that is 2.5 SD below that norm is diagnostic for osteoporosis. Other diagnostic tests include x-rays, bone scans, examination of present risk factors, and various laboratory tests such as blood calcium and vitamin D levels (NIH, 2010).

Payment for osteoporosis screening and subsequent follow-up has clinical implications. Although BMD tests are the gold standard for osteoporosis diagnosis, many private insurers do not cover the cost. Medicare began paying for a screening DEXA in 1998 and will cover a screening DEXA every 24 months and every 12 months for those on treatment for the disease. Anders, Turner, and Wallace (2006) propose the use of clinical decision rules to guide the diagnostic process. Several valid instruments are available, including the Osteoporosis Risk Assessment Instrument, the Age, Body Size, No Estrogen, and the Osteoporosis Self-assessment Tool. Tools such as the Fracture Risk Assessment Tool (FRAX) can predict risk for fractures and assist clinicians in deciding when to implement therapies. Waugh et al. (2009) completed a systematic review to determine major risk factors for BMD in healthy women aged 40 to 60 years, which could help to identify those in need of screening to decrease unnecessary testing. They found that only two of the commonly identified risk factors were significant in this age group, low body weight and years since menopause.

To prevent osteoporosis, the NOF (2010) recommends that everyone should have an adequate intake of calcium and vitamin D, avoid tobacco, identify and treat alcoholism, and participate in exercise. The recommended total daily calcium intake is 1200 mg/day, including supplements. Calcium intake that exceeds that amount may put the individual at risk for kidney stones or cardiovascular disease. A calcium intake calculator is available in their document.

Vitamin D is a secosterol, more of a hormone than a vitamin. Vitamin D is synthesized by the skin's exposure to the sun's ultraviolet rays. Some foods contain vitamin D, and many foods are fortified with vitamin D in the United States. Vitamin D regulates serum calcium, aiding in the absorption of calcium into bones. Experts debate the level of vitamin D that constitutes a deficiency, although most minimum proposed levels range between 20 ng/ml and 30 mg/ml. There is also a debate regarding the appropriate dosage of supplements necessary to replace vitamin D. Often, the recommended dosage is 400 to 600 IU daily, but recent studies have found that taking a minimum of 800 IU of vitamin D is effective and safe as well as doses up to 50,000 IU biweekly. Vitamin D is stored in fat, and deficits need to be replaced as often as 50,000 IU/week as a loading dose of vitamin D is prescribed.

Pharmaceutical treatment options for osteoporosis are increasing; they include bisphosphonates, calcitonin, estrogen or hormone therapy, estrogen agonist/antagonist, and parathyroid hormone. Biphosphonates are available in forms that can be given daily, weekly, monthly, or yearly. Side effects are similar for all oral bisphosphonate medications, with the primary concerns being gastrointestinal problems, difficulty swallowing, esophageal irritation, and gastric ulcer. Calcitonin is a daily nasal spray, one of the earliest forms of therapy. Hormone therapy, although effective in increasing bone density, has risks that might outweigh the benefits. The estrogen agonists/antagonists offer another option and may also reduce the risk of invasive breast cancer. Parathyroid hormone, teriparatide, is an injectable treatment. Currently, its use is only recommended for 2 years with follow-up therapy using biphosphonates.

Recent nursing research has investigated the knowledge regarding osteoporosis in individuals with recent fractures (Giangregorio et al., 2010). Greene and Dell (2010) investigated the outcome of an osteoporosis disease management program managed by nurse practitioners. Chang (2007; Chang, Yang, Chung, Chen, & Cheng, 2010) investigated the knowledge, beliefs, and behaviors of relatives of those with osteoporosis. Doheny, Zellar, and Estok (2010) explored the knowledge of participants with regard to smoking and osteoporosis. Other work by nurses explored the effectiveness of educational programs (Nieto-Vazquez, Tejeda, Colin, & Matos, 2009). The lack of nursing investigation into issues related to osteoporosis is disappointing, and much of the work by nursing has focused on falls and the prevention of fractures rather than the disease itself.

The prevention and treatment of osteoporosis are closely connected to the science of nursing. Health promotion is a key to preventing the disease. Lifestyle modification is an essential aspect in the management of osteoporosis, and nursing practice is well prepared to provide teaching and management. Future nursing research could focus on the life span aspect of intervention to prevent osteoporosis as well as the maintenance or restoration of function in those who suffer from the disease and its consequences. The nursing profession, integral to health care from the cradle to the grave, needs to increase osteoporosis awareness and to research the prevalence, prevention, and adaptation of individuals to this chronic disease.

Evelyn Duffy
Geraldine A. Britton
Sheri Stucke
Rosemary Collier
Sarah H. Gueldner

OUTCOME MEASURES

Outcome measures are broadly used in clinical research as well as in health services research, also referred as *outcomes research.*

Outcome measures as end points in clinical research typically refer to a narrowly defined patient condition specific to a particular disease. In contrast, outcomes in health services research are used to characterize a range of constructs that are important for patients, provider organizations, or health policy makers and reflect the quality of care provided in a specific setting. Not only are the outcomes more broadly defined in health services research but also the interventions that target these outcomes. Although clinical research traditionally focuses on drugs or surgical procedures, health services research includes also interventions that reorganize patient care (Kane, 2006). The appropriate Medical Subject Heading "Outcome Assessment" of the National Library of Medicine (1992) stresses the importance of attaining a specified outcome, which implies an increase, a decrease, or generally an improvement in the outcome measure. Therefore outcome measures in health services research can be considered as indicators of a desired change of an important measure and are frequently used in research investigating health care quality.

The first efforts in standardized outcome measurement in health care began with Florence Nightingale (1863). Her work on hospital mortality and her proposal for a regular hospital statistic are the foundations of this type of inquiry (Nightingale, 1863). In the last two decades, research on outcome measures has gained momentum as part of the growing awareness of health care quality issues. Starting with increasing interest in provider profiling and highly acclaimed national reports about patient safety and health care quality (Institute of Medicine, Committee on Quality of Health Care in America, 2001), outcome measures have become a vital part of quality research. In recent years, major federal health policy initiatives, such as those used by the Centers for Medicare and Medicaid Services to pay for performance and public reporting initiatives, have been incorporated outcome measures. The use of outcome measures in national health care policy requires a high degree of data standardization across sites, which has been guided by federal agencies like the Agency for Healthcare Research and Quality (AHRQ) and nonprofit organizations like the National Quality Forum (NQF). AHRQ as part of the Department of Health and Human Services aims at improving quality and safety in health care and therefore funds a range of research projects and outcome focused initiatives. AHRQ's quality indicators initiative provides four standardized sets (prevention, inpatient, patient safety, and pediatric) of indicators that can be derived from administrative hospital inpatient data (http://www.qualityindicators.ahrq.gov/). Furthermore, AHRQ maintains the National Quality Measures Clearinghouse (http://qualitymeasures.ahrq.gov/), which provides information on specific evidence-based health care quality measures. NQF aims for the standardization and endorsement of quality indicators, including outcome measures. In 2004, NQF endorsed a nursing-sensitive care measure set, which has become the landmark of outcome measurement of nursing quality (NQF, 2004). This measure set consisted of 15 process, structure, and outcome measures deemed to be nurse-sensitive performance measures. Nurse sensitivity refers to measures "that are affected, provided, and/or influenced by nursing personnel" (NQF, 2004, p. 2). The latest endorsement consists of 12 nurse-sensitive measures of which three can be considered as outcomes: pressure ulcer prevalence, falls prevalence, and falls with injury. Increasing interest in nursing outcomes has supported the development and widespread use of nursing quality data including outcome measures. The largest program to collect nursing outcome data has been the National Database of Nursing Quality Indicators (n.d.), which collects quarterly data for more than 16,000 units in more than 1,600 hospitals across the United States and internationally (http://www.nursingquality.org).

Outcome measures are often used in reference to Donabedian's (1992) structure–process–outcome paradigm, the predominant quality model in health care. Donabedian defines outcomes as "states or conditions of individuals or populations attributed or attributable to antecedent healthcare" (p. 356). Donabedian's framework of health care quality, which integrates measures of structures, processes, and outcome, has been instrumental for the development of outcome research and quality measurement. These informational domains are not considered as attributes of health care quality but deliver evidence to make inference about the quality provided. Here structures refer to physical and organizational properties (e.g., staffing), whereas processes describe the treatment of and interventions done for patients. Finally, outcomes describe what is accomplished for the patient (Donabedian, 1992). Depending on the aim of the quality assessment, outcomes can be classified in seven different groups: clinical, physiological-biochemical, physical, psychological (mental), social and psychosocial, integrative outcomes, and evaluative outcomes. Outcome research in the past has strongly relied on observational research often using large-scale databases. Because of its close relationship to quality and quality improvement, a stronger focus on the implementation of quality improvement initiatives has developed in recent years with stronger focus on interventional designs.

Outcome measures are indicators of a change of patient health status, important to patients, health care organizations, and policy makers. Currently, outcome data are compiled from a wide range of sources such as clinical, administrative, and survey data, which too often puts redundant, if not conflicting, data collection burdens on health care providers. Lack of alignment of measure specifications makes it difficult to compare analytic results from data sets using different specifications. The development of interoperable electronic medical records will reduce redundant data collection efforts and promote faster reporting of outcomes to health care providers.

Michael Simon

PAIN

Pain is a symptom, defined as an "unpleasant sensory and emotional experience associated with actual or potential damage or described in terms of such damage; pain is always subjective" (International Association for the Study of Pain, 1979, p. 250). Pain is a common component of illness and is the most common reason that people seek medical attention. Nurses assess patients for pain and in collaboration with the patient and the physician; they endeavor to reduce or relieve pain and to minimize the risk for long-term adverse effects of unrelieved pain. People experience pain in different ways and only those who are experiencing pain know what it is really like. Communication of that pain to caregivers is dependent on the verbal abilities of the patient; those who are very young and those who are cognitively impaired are at risk for being misunderstood by the caregiver.

Pain generally is classified into two types: acute and chronic. However, there are many different types and causes of pain. There is acute pain after surgery and injury and during labor, sickle cell crisis, and health care procedures. Acute pain subsides as healing takes place. Acute pain has a predictable end and is of brief duration, usually less than 3 to 6 months. Chronic pain is said to be that which lasts longer. Chronic pain can occur in any system and can be recurrent or constant. Cancer pain is from the enlarging tumor, its metastases, or its treatment and can increase in intensity and extent as the disease progresses. "Breakthrough pain" are acute periodic increases in chronic cancer pain. The types of pain that are classified by the age or health context include pain in infants, the critically ill, the cognitively impaired, and at the end of life.

The undertreatment of pain has been well documented for the past 37 years (Marks & Sachar, 1973). Barriers to the effective treatment of pain include clinicians' lack of knowledge of pain management principles, clinician and patient attitudes toward pain and drugs, and overly restrictive laws and regulations regarding use of controlled substances. The undermanagement of pain has been particularly pronounced in children, in the elderly, and in those who cannot speak. Pain relief in palliative care and at the end of life is receiving increased attention around the world.

Pain management includes pharmacological, cognitive-behavioral, physical, radiation, anesthetic, neurosurgical, and surgical techniques. Analgesics administered orally or intravenously are needed for moderate to severe pain, and cognitive-behavioral techniques such as relaxation, music, and distraction can increase the relief. More complex pain may require evaluation and treatment by a multispecialty pain management team. The successful management of pain generally depends on a careful assessment of the pain, patient education for pain management, appropriate pharmacological and nonpharmacological intervention, reassessment to determine the effectiveness of interventions used, and reintervention until satisfactory relief is obtained (Good & Moore, 1996).

Pharmacological management of pain usually is treated by three types of drug: (a) aspirin, acetaminophen, and nonsteroidal anti-inflammatory drugs; (b) opioids; and (c) adjuvant analgesics. Nonsteroidal anti-inflammatory drugs decrease the levels of inflammatory mediators generated at the site of tissue injury, thus blocking painful stimuli. They are useful in the management of mild pain and may be used in combination with opioids for moderate to severe pain. Opioids are morphine-like compounds that produce pain relief by binding to opiate receptors. They are used with moderate and severe pain. Patient-controlled analgesia is the use of equipment that is set to prescribed parameters to administer opioids intravenously, subcutaneously, orally, or epidurally. Adjuvant drugs are used to increase the efficacy of opioids and to treat other symptoms that exacerbate pain.

Physical modalities for pain management include use of heat and cold, counterstimulation such as transcutaneous electrical nerve stimulation, and acupuncture. Cognitive techniques are focused on perception and thought and are designed to influence interpretation of events and bodily sensations. Providing information about pain and its management, helping patients think differently about pain, and distraction strategies are examples of cognitive techniques. Behavioral techniques are directed at helping patients develop coping skills to modify their reactions to pain. Cognitive–behavioral techniques commonly used by nurses and other clinicians include relaxation, music, imagery, distraction, and reframing. Psychotherapy, social support, and hypnosis also have been used successfully in pain management.

Other management techniques may be used when the use of drugs is not adequate to manage pain. The choice of techniques depends on the cause of the pain and these therapies may be either temporary or permanent. Radiation therapy is used to relieve metastatic pain and symptoms from local extension of primary disease. Nerve blocks are the injection of a local anesthetic into a spinal space or peripheral nerve destruction. Surgical procedures are used to remove sources of pain, such as debulking a tumor that is pressing on abdominal organs or removing bone spurs that are compressing nerves. Neuroablation techniques surgically interrupt the nerve and the transmission of painful impulses.

The gate control theory published by Melzack and Wall (1965) provided a theoretical basis for explaining how pain, transmitted as electrical signals from the periphery to the brain, can be influenced by cognitive, affective, and physiological factors. Theories of pain have evolved in recent years to the idea of a mind–body unity that Melzack (1996) calls a neuromatrix. An active brain is part of a whole person who has been shaped by genetics and learning to respond to noxious stimuli in individually characteristic patterns. Recent studies of the role of genetics, endorphins, and immune factors and imaging studies of the thalamus, anterior cingulate, limbic system, and cortex support a holistic theory that goes beyond the mechanics of transmission of noxious messages. An appreciation of the mind–body experience of pain provides a basis for multidisciplinary research and practice, multicultural responses, and multimodal strategies for managing pain. Middle-range nursing descriptive theories of pain have focused on the whole person and prescriptive theories of pain management have focused on prescriptions for relief.

In recent years, various agencies and organizations have published guidelines for the management of pain. These have included guidelines published the American Pain Society: on analgesic use and pain in cancer, arthritis, sickle cell disease, fibromyalgia, low back pain. In addition, there are American Pain Society guidelines for the use of chronic opioid therapy in chronic noncancer pain. The Joint Commission for Accreditation of Healthcare Agencies includes policies and procedures for pain management in their standards. Pain relief is a patient's right, but there is greater consensus regarding management of acute and cancer pain than for chronic nonmalignant pain.

Marion Good

PALLIATIVE CARE

The goal of palliative care is to prevent and relieve suffering and to support the best possible quality of life for patients and their families, regardless of the stage of the disease or the need for other therapies (National Consensus Project [NCP] for Quality Palliative Care, 2009). Palliative care expands traditional disease-focused medical treatments to include the goals of enhancing quality of life for patient and family, optimizing function, helping with decision making, and providing opportunities for personal growth. An Institute of Medicine (IOM) report on end-of-life care has called for models of care that implement palliative care concurrently with disease-focused care earlier in the course of disease, patient-focused care, and self-management (IOM, 1997).

The NCP for Quality Palliative Care (2009) recognized that multidimensional support of patients and their loved ones is essential to quality palliative care. The leading palliative care organizations and professionals involved in the creation of this document recognized the importance of integrating palliative care as part of the continuum of care. These reports support inclusion of palliative care as a mechanism to meet patient and family needs and their ability to take care of their health.

Palliative care

- provides relief from pain and other distressing symptoms;
- affirms life and regards dying as a normal process;
- intends neither to hasten nor postpone death;
- integrates the psychological and spiritual aspects of patient care;
- offers a support system to help patients live as actively as possible until death;
- offers a support system to help the family cope during the patient's illness and in their own bereavement;
- uses a team approach to address the needs of patients and their families, including bereavement counseling, if indicated;
- will enhance quality of life and may also positively influence the course of illness; and
- is applicable early in the course of illness, in conjunction with other therapies that are intended to prolong life, such as chemotherapy or radiation therapy, and includes those investigations needed to better understand and manage distressing clinical complications.

At the turn of the twentieth century, Americans died from diseases such as yellow fever, small pox, diphtheria, and cholera. Death was often rapid with little time to say goodbye to loved ones. In 1900, life expectancy was less than 50 years of age for men and women, whereas in the year 2000, the median age of death was 77 years old. Currently, Americans are struggling to develop a health care system that is both cost-effective and can ensure a "good life" and a "good death."

Two landmark studies from the 1990s, specifically, the *Study to Understand Prognosis and Preferences for Outcomes and Risks of Treatments* (SUPPORT Principal Investigators, 1995) and the IOM's (1997) report *Approaching Death: Improving Care at the End of Life*, provide evidence of the need to improve the care of the dying in America. The fear of experiencing a "bad death" seemed warranted by the conclusions of a 5-year study of the end-of-life care received by 9,000 dying hospitalized patients. The *Study to Understand Prognosis and Preferences for Outcomes and Risks of Treatments* (SUPPORT Principal Investigators, 1995) was designed both to increase understanding of hospitalized dying and to devise an intervention to promote more humane care of dying patients. The SUPPORT data confirmed the high reports of pain among dying patients (more than 50%), the clinicians' lack of training in pain management, and the institutional limitations on the delivery of pain-control interventions. In addition, the SUPPORT data confirmed that patients' end-of-life treatment preferences, whether written or verbally communicated to nurses or family members, were often ignored by physicians or were otherwise ineffective in furthering the autonomous choices made by patients (SUPPORT Principal Investigators, 1995).

In palliative care, death is also viewed as an outcome measure for improving end-of-life care. The IOM's (1997) report provided some conceptual benchmarks from which quality outcome indicators can be developed. A "good death" was defined as one free from avoidable stress and suffering for patients and families and caregivers, in general accord with patients' and families' wishes, and reasonably consistent with clinical, cultural, and ethical standards. In contrast, a "bad death" was one in which there was needless suffering, disregard for patients' or family's wishes or values, and a sense among participants or observers that the norms of decency had been offended. This is the challenge of nurses and all health professionals in the twenty-first century.

Two reports that followed, *Improving Palliative Care for Cancer* (IOM, 2002a) and *When Children Die: Improving Palliative and End of-Life Care for Children and Their Families* (IOM, 2002b), continued the argument that medical and other support for people with fatal or potentially fatal conditions often fall short of what is reasonable, if not simply attainable. The IOM report highlighted the inadequacy of current knowledge to guide the practice of clinicians in end-of-life care and the need for support from policy makers.

The hospice concept originated in the Middle Ages when pilgrims traveling to the Holy Land found their minds and bodies restored when they stopped at way stations attended by religious orders. Dame Cicely Saunders, a nurse who later became a social worker and physician, is credited with opening Saint Christopher's Hospice in London where she championed the need for a multidisciplinary approach and around-the-clock administration of opioids when caring for dying patients. Her approach to care focused on comfort, skilled nursing, family counseling, physical therapy, and addressing spiritual needs. These fundamental elements of care characterize quality palliative care. The hospice model serves as the gold standard for offering the best end-of-life care to patients and their families; palliative care found its roots in the hospice movement. The World Health Organization (2002) defines palliative care as an approach that improves the quality of life of patients and families who face life-threatening illness by providing pain and symptom relief, spiritual and psychosocial support to from diagnosis to the end of life, and bereavement.

Newer models of palliative care address both disease-specific therapies as well as supportive-comfort therapies that promote the optimal function and well-being of patients and their family caregivers. The Canadian Palliative Care Association's (1995) model documented how palliative care needs intensify at the end of life. The core issues of palliation, comfort, and function are salient throughout the course of disease. A palliative care model recognizes the need to address symptom distress, physical impairments, and psychosocial disturbance even during the period of aggressive primary therapy with goals of cure or the prolongation of life (NCP for Quality Palliative Care, 2009).

Definitions of palliative care have evolved based on the work of the NCP for palliative care (NCP for Quality Palliative Care, 2009). Palliative care and hospice programs have grown in the United States in response to a population living with chronic, debilitating, and life-threatening illness and to clinician interest in effective approaches to providing care. In 2004, five major palliative care organizations led an NCP for Quality

Palliative Care (2004, 2009) to improve the quality of palliative care in the United States. Efforts resulted in "Clinical Practice Guidelines for Quality Palliative Care." The guidelines were organized into eight domains of care and aim to promote quality and reduce variation in new and existing programs, to develop and encourage continuity of care across settings, and to facilitate collaborative partnerships among palliative care programs, community hospices, and other health care settings. Fundamental processes that cross all domains include assessment, information sharing, decision making, care planning, and care delivery. Developers incorporated established standards of care from Australia, New Zealand, Canadian, the Children's Hospital International, and the National Hospice and Palliative Care organizations. Studies will be needed to evaluate the usefulness of the guidelines to foster access to care; continuity across settings, such as home, residential, hospital, and hospice; development of national benchmarks for care; uniform definitions that assure reliable quality care and encourage performance measurement; and quality improvement initiatives for palliative care services.

Factors that have contributed to the palliative care movement in the United States include the growing aging population, the assisted suicide debate, the reduced patient autonomy, and the inappropriate end-of-life care (i.e., overtreatment of medical conditions and undertreatment of pain and depression). Quality outcomes of good palliative care ensure that patients' values and decisions are respected; comfort is a priority; psychosocial, spiritual, and practical needs will be addressed; and opportunities will be encouraged for growth and completion of unfinished business (NCP for Quality Palliative Care, 2009).

Research results indicate that there is an overwhelming need for improved symptom management at the end of life for both adults and children. Patients at the end-of-life experience many of the same symptoms and syndromes regardless of their underlying condition. To decrease patient and family suffering at the end of life and improve symptom control, in-hospital programs are adopting a palliative care model that offers comprehensive care for seriously ill patients and their families.

Technologies that sustain life by artificial means have increased our ability to prolong life, yet they have raised many moral, ethical, and legal dilemmas for Americans. Some bioethicists contend that the real political struggles of the twentieth century have not been over legal rights, but over control in the "way" individuals live their lives. Supreme Court rulings regarding the right to abortion, to die or cause death, to make family decisions, to live, to control one's own body, to health care, to refuse hydration, and to self-determination are examples of health care issues brought forth in the last few decades (Annas, 1993, 1995; Matzo & Hijjazi, 2008).

Views toward death and dying in American culture continue to change at a relatively consistent pace as evidence is compiled documenting the need to improve the care of the dying and their families. This challenge to nurses and nurse educators is a formidable one in the decades ahead. Nurses leading the field need advanced education in palliative care. All nurses need to know when the services of an interdisciplinary specialist-level palliative care team are indicated and how to access them. They need to be aware of evidence-based clinical practice guidelines in palliative care and how to implement and evaluate them to achieve desirable patient and family outcomes.

Nurses are an essential voice in these discussions in their roles as patient and family advocates, clinicians, leaders, health care policy makers, educators, and as researchers. Education in the legal, moral, and ethical principles and decision-making models are essential for nurses to have an impact in determining the quality of care offered to individuals at the end of life and empowering patients to take an active role in achieving this outcome.

Marianne Matzo

PARENTING RESEARCH IN NURSING

Parenting is as a process that involves a complex set of responsibilities, including being present for the child; caregiving, teaching, protecting, and encouraging the child; and advocating on behalf of the child. These responsibilities evolve over time as the child and parent mature and change in response to environmental contexts and any special needs of the child.

Parenting is a major focus of nursing and an identifiable group of nurse researchers who study parents and parenting has emerged (Anderson, Riesch, Pridham, Lutz, & Becker, 2010; Beeber & Miles, 2003; Holditch-Davis & Black, 2003; Lutz, Anderson, Riesch, Pridham, & Becker, 2009; McBride & Shore, 2001; Miles, 2003, 2005; Pridham, Lutz, Anderson, Riesch, & Becker, 2010; Riesch, Anderson, Pridham, Lutz, & Becker, 2010; Webster-Stratton & Reid, 2010). Like parenting researchers from other disciplines, nurse researchers agree that parenting plays a critical role in child development. The substantive focus of nursing research on parenting is varied and includes parenting during the transition to parenthood, parenting of high-risk infants, parental responses to children's acute and chronic illnesses, parenting of healthy children and adolescents, and problematic parenting including parenting children with behavioral problems. However, with the exception of studies on the effects of parenting infants and children with health problems on parental health, mental health, distress, and bereavement, the other side of parenting—its effects on the lives of adults—has received relatively little attention (McBride & Shore, 2001). There has also been limited research on the parenting experience of adults with chronic or acute illnesses.

Designs for this body of parenting research vary and include qualitative studies, descriptive and correlational designs, and interventions with parents. Like other areas of nursing research, commonly used data collection methods include qualitative interviews and self-report questionnaires of parents and, to a lesser degree, children. In addition, videotaped and direct observations of interactions of parents with children, primarily infants or preschool children, are frequently used (Pridham et al., 2010). These observations are scored using standardized assessments such as Kathryn Barnard's NCAST scales (currently referred to as Parent–Child Interaction Scales) or investigator-developed ratings or coding scales.

Parenting during the transition to parenthood has probably received the most attention from nurse researchers (Lutz et al., 2009; Pridham et al., 2010). Areas of research include maternal identity and competence, adjustments to parenting a newborn infant, parent–infant interactions, and the effects of stressors such as older maternal age, infertility, or a high-risk pregnancy. Fathers are beginning to be studied. Researchers have also studied the development of the parental identity during pregnancy, maternal–fetal attachment, emotional tasks of pregnancy, and postpartum depression.

A related area of research focuses on parenting high-risk infants, including infants who are premature, technologically dependent, prenatally exposed to substances, multiple births, or temperamentally difficult (Lutz et al., 2009; Pridham et al., 2010). Researchers have explored the emotional distress and sources of stress of parents during the infant's neonatal intensive care hospitalization (Holditch-Davis & Black, 2003; Miles, 2005). Of particular concern is the impact of parental distress and parent–infant separation on subsequent parent–child interactions and attachment. Parental influences on development of high-risk infants have also been identified through longitudinal studies. Recently, nurse researchers have tested a number of intervention studies for this population, including support programs in the intensive care unit and home visiting programs (Pridham et al., 2010).

Another focus of nursing research has been on parents of acute and chronically ill children (Anderson et al., 2010). Studies on the experiences of parents of acutely ill children have explored parental emotional responses, participation in care, and stress during hospitalization (Youngblut, 1998). Several interventions aimed at reducing stress and supporting parenting have been conducted. Studies of parents of children with chronic illnesses or developmental disabilities have focused largely on the impact of the child's diagnosis, stressors associated with treatments and repeated hospitalizations, and parental management of the illness (Miles, 2003). A small but important body of descriptive research about parents' relationships with nurses and other health care providers demonstrates the powerful role nurses have in affecting parental responses and maintaining the parental role, especially during acute illnesses. Studies of parents of ill children have largely been limited to descriptive, cross-sectional studies done with small convenience samples from in one institution. Intervention studies are increasingly being tested, but very few longitudinal studies, even within the period of hospitalization, have been conducted. More research is needed to explore the influence of parenting on health and developmental outcomes in ill children and on the nature of the interaction of health care providers and parents and how to strengthen those interactions.

Nurse researchers have also studied parenting of normal, healthy children. Preschool children have been studied the most, with less attention to parenting the school-aged, adolescent, and young adult child (Riesch et al., 2010). Much of this research has looked at parental perceptions of the child or parental effects on child outcomes, such as obesity or substance abuse, rather than parenting per se. However, discipline as an aspect of parenting has received attention. This research has examined the effects of maternal employment, maternal depression, supports for parenting, and issues involved in parenting by grandparents, parenting after divorce or during period of partner conflict, parenting during maternal chronic illness, or parenting after the death of a spouse. In addition, nurse researchers have begun to study ethnic differences in parenting. However, only very limited research has examined parenting with siblings.

Problematic parenting has been another focus of nursing research. Recently, researchers have begun to explore the effect of child behavioral and psychiatric conditions, such as attention deficit disorder, conduct disorder, autism spectrum disorder, and schizophrenia, on parents and parenting. Studies have also examined the impact of maternal mental health problems or substance abuse on parenting and parents who are abusive to their children. Another important aspect of problematic parenting has focused on parenting by low-income parents (Beeber & Miles, 2003), but the area receiving the most attention from nurse researchers has been adolescent parenting. Although a number of intervention studies have been conducted to improve parenting in these at-risk groups (Kearney, York, & Deatrick, 2000), many of the interventions were atheoretical. More theoretically based intervention studies aimed at improving parenting and removing situational or environmental obstacles to positive parenting are needed. Two major multidisciplinary teams, with nurses as primary investigators, have conducted research on designed parenting intervention for high-risk parenting situations: The Incredible Years (Webster-Stratton & Reid, 2010) and a home visiting program for low-income mothers with long-term follow-up of the outcomes (Kitzman et al., 2010).

The theoretical models used as frameworks for nursing research on parenting are as diverse as the substantive foci. Researchers interested in the transition to parenthood often build on the concepts put forth by Reva Rubin based on role attainment theory from sociology and adapted by Ramona Mercer and Lorraine Walker. Another commonly used framework is ecological systems theory, influenced by the work of Uri Bronfenbrenner, Jay Belsky, and Arnold Sameroff, and based on psychology. Within nursing, Kathryn Barnard's theory follows in this tradition. Recently, these theories have been combined into the developmental science perspective, which is beginning to be used in nursing research on parenting (Miles & Holditch-Davis, 2003).

Other theories used in parenting research by nurses include attachment, cognitive, and stress theories. Attachment theory with has its origins in ethology and is influenced by the work of John Bowlby and Mary Ainsworth. This framework is widely used in infancy and preschool parenting research. Cognitively based theories of parenting, such as that developed by Karen Pridham, are used in studies of mothering during the prenatal and postpartum periods. Finally, models that build on various stress and coping models, such as Margaret Miles' Preterm Parental Distress Model, have been used in studies of the impact of acute illness on parents.

Despite this theoretical diversity, much of the nursing research conducted in the area of parenting remains atheoretical and descriptive. Therefore, the findings in this area of research are fragmented, and often nurse researchers are not building a coherent science on parenting. The major gaps in the parenting literature in nursing include a need for more information about fathering and on parenting of adolescents and young adults. Although there is an increasing number of parenting studies published by nurses from around the world, there is still a need for research that examines parenting from a cultural perspective. Nursing researchers need to go beyond comparing ethnic groups and move toward understanding what is effective and adaptive for parents from varying ethnic backgrounds and different cultures. Likewise, nurse researchers need to conduct more longitudinal studies that study parenting as a process that unfolds over time and focus as much attention on parenting strengths as on parenting deficits.

Diane Holditch-Davis
Margaret Shandor Miles

PARSE'S HUMANBECOMING SCHOOL OF THOUGHT

Humanbecoming school of thought (Parse, 1992, 1995) was first titled *Man–Living–Health: A Theory of Nursing* (Parse, 1981). In 1998, Parse published *The Human Becoming School of Thought: A Perspective for Nurses and Other Health Professionals*. Also, her theory has evolved into a humanbecoming school of thought (HST) that views the uniqueness of humans as unitary beings in mutual process with a multidimensional universe.

Parse (1998) draws from Roger's Science of Unitary Human Beings and the writings on existential phenomenology when she defines the person as being in a process of continuous becoming within the humanbecoming school of thought. Each person cocreates reality in mutual process with the environment. Quality of life is a central concept within the HST. The goal of nursing is quality of life in Parse's theory, thus demonstrating the importance of this concept with the theory.

Humanbecoming is viewed as (1) "freely choosing personal meaning with situation, living with value priorities," (2) "configuring rhythmical patterns of relating with humanuniverse," and (3) "cotranscending illimitably with emerging possibles" (Parse, 1998, p. 29). Each of these assumptions is linked to a principle about humanbecoming. These three principles constitute the theoretical structure. Principle 1 states, "structuring meaning multidimensionally is cocreating reality through the languaging of valuing and imaging" (Parse, 1998, p. 35). The major conceptual processes of this principle are imagining, valuing, and languaging (Parse, 1998). Principle 2 is that "co-creating rhythmical patterns of relating is living the paradoxical unity of revealing-concealing, enabling-limiting, and connecting-separating" (Parse, 1998, p. 42). Principle 3 states, "cotranscending with the possibles is powering unique ways of originating in the process of transforming" (Parse, 1998, p. 46). The key conceptual processes for this principle are powering, originating, and transforming (Parse, 1998). In 2007, Parse provided clarification of wording in the HST. She wished to make clear the notion of indivisibility by creating *homecoming* as one word, and *humanuniverse* as all one word (Parse, 2007). She added four postulates, illimitability, paradox, freedom, and mystery, which are woven into the three principles (Parse, 2007).

Parse (2007) has developed a specific research methodology based on phenomenological hermeneutic methods. It is a qualitative method that focuses on universal human experiences described by research participants. There are three phases involved in this research, dialogical engagement (researcher-participant), extraction synthesis (dwelling with the data), and heuristic interpretation (Parse, 2007). The foci of knowledge development for the discipline within this type of research are the universal lived experiences of individuals, such as hope, joy-sorrow, grieving, and persevering.

Parse (2004) continues to expand her theoretical perspectives with the introduction of the humanbecoming teaching–learning processes. The humanbecoming teaching–learning model is made up of essences, paradoxes, and processes. The essences are semantic coherence, synergistic patterning, and aesthetic innovating (Parse, 2004). The paradoxes are rational–intuiting, clarifying–obscuring, waring–woofing, ebbing–flowing, considering–composing, and beholding–refining (Parse, 2004). The processes are living with ambiguity, appreciating the mystery, potentiating integrity, weaving multidimensionally, honoring wisdom, and witnessing unfolding (Parse, 2004).

Updated by Mary T. Quinn Griffin

PARTICIPANT OBSERVATION

Participant observation is an approach to data collection that is most often associated with naturalistic or qualitative inquiry, and it involves the researcher as a participant in the scene or observation that is being studied. The primary purpose is to gain an insider's, or emic, view of an event, a setting, or a general situation. The researcher focuses on the context of the scene along with the ways that individuals are behaving. Examples might include making and participating in observations in a busy emergency room, observing the ways in which people carry out rites of passage, or participating in a special feast or occasion. The researcher attempts to make sense of the situation by interpreting personal experiences and observations and talking with individuals who are present, while simultaneously being fully involved in all of the experiences that occur in that setting. In this way, participant observation enables the researcher to gain a view of a society but also serves as a way to validate verbal information that was provided by members of a society or group being studied. Another way in which participant observation may be used in research is with populations in which there is limited communication, such as very small children, the mentally impaired, or elderly stroke survivors. The challenge for the researcher is to combine the activities of observation and participation so that understanding is achieved while maintaining an objective distance.

To carry out participant observation, the researcher needs to decide on (a) the role of the observer, (b) the degree to which the role is known to others, (c) the degree to which the purpose is known to others, (d) the amount of time that will be spent in conducting the observation, and (e) the scope of the observational focus. There is a continuum along which the role of the observer may be involved that ranges from involvement of the researcher in all aspects of the observational experience to only partial or minimal involvement. The researcher bases this determination on the research question and the nature of the research. For example, a researcher who assists in a homeless shelter may wish to be involved in all aspects of the daily routine; another researcher may wish only to conduct observations in a busy emergency room for which the routine is more complex. On the other hand, an invitation to participate in a special ceremony or ritual may involve only partial participation.

The degree to which the observer's role and the purpose of the observation are known to others also is related to the intent of the research. In some cases, the role of the researcher will be known to all, and in others it may not. If the purpose of the study is to know and understand a particular ritual or religious ceremony, for example, the role of the researcher may be known to all involved in the situation. In other cases, the role of the researcher may be minimized, as in situations in which the informants may not fully understand the researcher's participation: observing children on a playground or in a children's unit in a hospital. However, ethical and moral issues arise when the nature and role of the researcher are not made known to all of the individuals being observed. The extent to which individuals are informed varies greatly, from full disclosure to no disclosure, and is often based on the researcher's estimation of how scientific truth can best be obtained.

The amount of time the researcher spends in observation and the scope or focus of the observation also depend on the purpose and intent of the research. In some cases, the participant observation experiences are carried out for the length and duration of the research. In other research studies, participant observation may occur at only one point during the study. For example, sometimes a researcher may choose to enter the field and become a participant observer prior to conducting interviews. This gives the researcher time to learn about a community, group of people, or situation and then to use this knowledge to develop questions for subsequent interviews. In addition, the focus and intent of the observations may vary from making general observations of the entire situation, context, or event to very focused observations. For example, a focused observation might include personal interactions or a specific nursing or caring behavior.

One major concern in using participant observation is the degree to which subjects may become sensitized to the researcher's presence and may not behave as they normally would if the researcher were not present. The issue of subject sensitization can be addressed by increasing the duration of time the researcher spends in the observational experience. A longer time spent in observing can also enhance and strengthen the researcher's credibility as well as any theoretical and empirical generalizations that are made.

In summary, participant observation is a commonly used approach to data collection that is used in naturalistic or qualitative research. It is an approach that allows the researcher to gain an insider's perspective on a social situation or event and can permit the researcher to be totally or minimally involved.

Kathleen Huttlinger

PATIENT CARE DELIVERY MODELS

It could be stated without argument that the first nursing care delivery model was initiated by Florence Nightingale (c. 1859) during the Crimean War. It was Nightingale who differentiated between the "head" nurse (she who did the thinking, planning, and directing of patient care) and the "floor" nurse, who in essence was the provider of that care (Nightingale, 1859). Thus, a hierarchical model for the delivery of patient care that prevailed for nearly a century in English and American health care facilities was born.

In the early years following the turn of the twentieth century, professional nursing was dominated by private-duty nurses who were employed through a "registry." These nurses cared for a single patient in the home or in the hospital (before the introduction of intensive care units). Oftentimes, the director of the nursing school also was the director of nursing in the hospital; nursing "pupils" provided the care of patients "on the wards," and nursing faculty provided the supervision of these students in their clinical rotations. After the stock market crash of 1929, when families could no longer afford private duty nurses, hospitals began to staff the wards with graduate nurses (new graduates not yet licensed) utilizing the original Nightingale hierarchical model.

In an effort to recruit and retain professional nurses, little by little, models such as *team* and *primary* nursing as well as *all RN staffs* began to evolve in health care settings and *advanced practice roles* such as the clinical nurse specialist and the nurse practitioner—which had an impact on the effective delivery of clinical nursing services, regardless of the setting. These models were popular in the second half of the twentieth century.

Team nursing is undoubtedly one of the earliest models designed to replace the hierarchical structure of the Nightingale model. Within this context, each team is composed of a mix of RNs, licensed practical nurses (LPNs), and certified nursing assistants (aides) responsible for a single group of patients. The number of teams on a given patient unit is obviously determined by the size of the unit. The onset of the *advanced practice nurse*, such as the *clinical nurse specialist* and/or the *nurse practitioner*, has had a major impact on professional practice in the organizational setting, while giving new meaning to the concept of team nursing. Although the nurse practitioner is generally thought of as providing primary care to a group of clients outside the hospital setting, many are employed within hospital-operated ambulatory care setting or within the hospital itself, many times providing the initial physical assessments of patients required by regulating agencies such as the State Health Department and the Centers for Medicare and Medicaid Services. Primarily prepared at the Master's level, these nurses in advanced practice roles serve as consultants to the nursing staff; they fill roles such as staff educator, researcher, administrator/manager, and, in many instances, as master clinician.

Primary nursing in its truest form assigns a "caseload" to the professional nurse, who is then responsible for each of his or her patients "around the clock," as it were. It is the responsibility of the primary nurse to make clinical rounds and to prescribe appropriate nursing interventions depending on client diagnosis. In the case of a hospital admission, the primary nurse maintains responsibility for the client(s) from admission to discharge; in a community health or long-term care, or home care setting, it is possible that the primary nurse maintains responsibility for the client over an extended period of time.

An *all RN staff* is expensive but self-explanatory. Within this model, professional nurses provide all dimensions of direct patient care whereas ancillary personnel are responsible for those tasks not involved in direct patient care. With the tightening of fiscal belts, cutbacks in Medicare and Medicaid reimbursement, organizational mergers, changes in organizational philosophy, and the like, except for limited instances one might conclude that the all RN staff has largely become a phenomenon of the past.

In 2007, the Robert Wood Johnson Foundation funded an original research project to identify and profile new models of care that could be widely replicated throughout the United States. In collaboration with Health Workforce Solutions LLC and through a broad-based e-mail inquiry, a literature search, and Internet research, 60 new care delivery models were selected for in-depth research interviews.

The group was narrowed through a process of comparing the models to criteria developed by a select group of chief nursing officers and executives, nurse managers, and academics from a variety of nursing schools. Twenty-four models were further investigated and selected to be included in a white paper titled *Innovative Care Delivery Models: Identifying New Models that Effectively Leverage Nurses*, published in 2008 by the Health Works Solutions group. At the same time, the Robert Woods Johnson Foundation created a Web site that contains the complete profiles of each model described, including a detailed description, impetus for its development, results, consideration for implementation, and replication and selected tools (http://www.innovativecaremodels.com).

The models are divided into three categories: acute care models, models that bridge the continuum of care, and comprehensive care models. Within the acute care models, there are components of earlier care delivery models with a more comprehensive role for the professional nurse. Some incorporate team nursing (medical–surgical unit team nursing, which is an RN–LPN team model; the model RN line model). The nursing caring delivery model is a team-oriented primary nursing model for providing inpatient and outpatient care based on Watson's Theory on Human Caring. Other models in the acute care arena have elevated the registered nurses role to a care coordinator overseeing the patient care of several patients whose direct care is being provided by novice nurses, LPNs, or nursing assistants. A new role has been created from these models of care coordinator called the clinical nurse leader who is a master's prepared nurse who leads teams of caregivers. Examples of the care coordinator models include the patient-centered care, the primary care coordinator, the unit-based case manager model, and the 12-bed hospital developed at the Baptist Hospital of Miami.

The care transitions models are designed to bridge the continuum of care between acute care and home or outpatient services. This is a model that will meet the needs of the new health care reform initiatives. Even more critical to future health care models will be the comprehensive care models developed to focus on people lives from prevention and wellness through the entire continuum including social programs.

To learn more about each of these models, go to www.innovativecaremodels.com.

M. Janice Nelson
Connie A. Jastremski

PATIENT CONTRACTING

Patient contracting is an intervention for promoting patient adherence in practice or research settings. Patient contracting provides an opportunity for patients to learn to analyze their behavior relative to their environment and to select behavioral strategies that will promote learning, changing, or maintaining adherence behaviors (Boehm, 1992). Patient contracting is relevant to nursing practice and research because it can assist patients to adhere to treatment regimens, such as medication taking, meal planning, physical activity, and monitoring airflow and blood glucose levels.

Research on the effectiveness of patient contracting in nursing has been reported for a variety of behaviors across age groups, settings, and disorders. For example, patient contracting has been used to control levels of serum potassium (Steckel, 1974) and serum phosphorus (Laidlaw, Beeken, Whitney, & Reyes, 1999) in patients on dialysis, to promote adherence to daily peak expiratory flow monitoring in children with asthma from pediatric practices (Burkhart, Rayens, Oakley, Abshire, & Zhang, 2007), to promote adherence to self-monitoring of blood glucose in adolescents with diabetes treated at a children's hospital clinic (Wysocki, Green, & Huxtable, 1989), to achieve rehabilitation goals in adolescents with tetraplegia who received multidisciplinary care in an inpatient rehabilitation unit (Gorski, Slifer, Townsend, Kelly-Suttka, & Amari, 2005), to increase knowledge and consistency in use of contraceptive methods by sexually active college women from a student gynecology clinic (Van Dover, 1986), to improve self-foot-care behaviors and reduce serious foot lesions in patients with type 2 diabetes in primary care (Litzelman et al., 1993), to increase knowledge, keep appointments, and reduce diastolic blood pressure in hypertensive outpatients (Steckel & Swain, 1977; Swain & Steckel, 1981), to and keep appointments, lose weight, and reduce blood pressure among outpatients with arthritis, diabetes, and hypertension (Steckel & Funnell, 1981). Patient contracting did not reduce blood glucose and glycosylated hemoglobin in patients with diabetes (Boehm, Schlenk, Raleigh, & Ronis, 1993; Morgan & Littell, 1988; Steckel & Funnell, 1981; Wysocki et al., 1989).

Patient contracting is the process in which the nurse and the patient negotiate an individualized, written, and signed agreement that clearly specifies the behavior and identifies in advance the positive consequences to be given when the patient has successfully performed the behavior (Steckel, 1982). The patient chooses the behavior and reinforcer in the contract with direction by the nurse. Patient contracting is based on the principle of positive reinforcement, which states that when a behavior is followed by a reinforcing consequence, there is an increased likelihood of the behavior being performed again (Boehm, 1992).

The nursing process provides the context within which to develop the patient contract. The nursing process provides the clinical data that can be jointly used by nurses and patients to establish priorities for adherence behaviors (Steckel, 1982). The adherence behavior is the ultimate complex behavior to be learned or changed. The adherence behavior is broken down into successive approximations or small steps. By performing small steps of the behavior, the patient gradually achieves performance of the adherence behavior. Over a series of patient contracts, the patient will specify a variety of behaviors, which include such behavioral strategies as self-monitoring, arranging and rearranging antecedent events, practicing small steps of the adherence behavior, and arranging positive consequences (Boehm, 1992). The first several patient contracts are usually for self-monitoring to identify the successive approximations of the adherence behavior and the antecedents and consequences of the behavior. In later patient contracts, patients specify behavioral strategies related to arranging antecedent events, practicing a small step of the behavior, or arranging positive consequences. Self-monitoring is ongoing throughout the behavior change process to provide data about the performance of the small steps of the behavior and the effectiveness of the new antecedents and positive consequences.

The reinforcer in the contract is chosen by the patient and provided by the nurse in return for evidence that the behavior was successfully performed, such as the self-monitoring records. Reinforcers are unique to patients. The availability of reinforcers varies greatly by the practice or research setting. For example, patients may request more convenient appointments, magazines, lottery tickets, etc. Tokens or points can be collected and exchanged for a larger reinforcer (Boehm, 1992).

Behavioral analysis is the foundation of the patient contracting intervention. Behavioral analysis is the process by which the patient's behavior is observed, recorded, and analyzed to describe the successive approximations of the adherence behavior, the antecedent events that precede the behavior, and the consequences that follow the behavior. The behavioral data used in the analysis are obtained by the patient through self-monitoring (Boehm, 1992).

Behavioral analysis begins with the patient self-monitoring the adherence behavior. Increasing self-monitoring is done using Smartphones or Internet Web sites. Self-monitoring provides baseline data that can be used to determine the effectiveness of the behavioral strategies implemented later in the behavior change process. By using the patient's self-monitoring records, the nurse can teach the patient to identify antecedent events that precede the behavior, small steps that comprise the behavior, and consequences that follow the behavior. On the basis of the behavioral analysis, behavioral strategies are specified that will assist in the behavior change.

An antecedent event precedes a behavior and prompts the behavior by identifying conditions under which a behavior will be reinforced or not (Boehm, 1992). Much behavior is under the control of antecedent events. When behavioral analysis demonstrates that the behavior the patient chooses to decrease or eliminate is cued by an antecedent event, the behavioral strategy is to rearrange, to avoid, or to eliminate the antecedent event. For example, the patient may take a different route home to avoid stopping at a fast food restaurant after work. Conversely, when the patient chooses to increase a behavior, the behavioral strategy is to arrange an antecedent event to cue the behavior. For example, setting out athletic shoes at night may cue walking the next morning.

Behavioral analysis can identify the multiple small steps that comprise the adherence behavior. When the small steps are identified, the behavioral strategy is to perform a small step of the adherence behavior for a designated period of time. When that small step is being successfully performed, the patient moves onto the next small step. Eventually, patients gradually achieve performance of the adherence behavior (Steckel, 1982). This behavioral strategy is effective because patients are often overwhelmed by expectations of a treatment regimen, which can lead to nonadherence. For example, sedentary patients who are beginning a walking program might start by walking 5 minutes five times per week. Each week the walking goal is gradually increased until they achieve their goal of accumulating 30 minutes of moderate intensity walking 5 days per week.

Positive reinforcement is the behavioral strategy in which a positive consequence is provided contingent upon performance of the desired behavior, which results in an increase in performance of the behavior. Behavioral analysis can identify positive consequences for behaviors and provide ideas for new consequences (Boehm, 1992). The behavioral strategy is to arrange positive reinforcement to acquire or maintain a desired behavior. For example, adopting a walking program will be strengthened if a positive consequence follows each walking goal that is met. Positive consequences can be pleasurable items and activities; social reinforcement, such as praise; and cognitive reinforcement, such as feelings of pride. Conversely, eliminating positive reinforcement can be used to decrease or extinguish an undesired behavior. For example, eating with selected companions may eliminate positive consequences for inappropriate food item selections.

There are several directions for future research. First, the feasibility and cost-effectiveness of changing single versus multiple adherence behaviors by patient contracting needs further study. Second, studies are needed to determine the frequency of contact needed with subjects to produce progressive changes in adherence interventions using patient contracting. Third, patient contracting during the maintenance phase of adherence interventions has not been studied. Fourth, whenever possible, studies should include objective measures of adherence behaviors, such as electronic event monitors to assess medication adherence and accelerometers or pedometers to assess physical activity.

Elizabeth A. Schlenk

PATIENT EDUCATION

Patient education is a process of providing individuals and their families with health information related to their medical conditions or procedures, treatment options, lifestyle behaviors, and health promotion (Centers for Disease Control and Prevention, n.d.). This information is provided in a variety of ways, including more traditional formats such as verbal instruction, demonstration and return-demonstration procedures, and written materials, and more recently in electronic formats through video, Internet, DVDs and CD-ROMs. Nurses are in a key role to provide health and disease self-management education to improve outcomes and quality of life for the patient, his or her family, and more globally, for the community at large to promote healthy lifestyles. The modern health care environment has become increasingly complex and more challenging for patients to navigate and understand medical terminology, technology, and care instructions (Sand-Jecklin, Murray, Summers, & Watson, 2010). As patient advocates, nurses are in the position to assess patients' current knowledge, learning needs, and readiness to learn to provide effective disease self-management education and education in healthy lifestyle behaviors.

Historically, patient education in the United States dates back to the mid-1800s with some physicians willing to share information regarding disease management and some guarding this information to prevent questioning of treatment modalities by patients (Bartlett, 1986). On the contrary, in Europe during the mid-1800s, Florence Nightingale (1859) was providing education to patients as well as other nurses regarding hygiene, nutrition, and aspects of health promotion. Patient education has since evolved from this narrow focus to empowering patients to take a lead in their health care and to changing health policy to mandate that clinicians in health care organizations provide and document proof of adequate patient education in self-management to receive reimbursement. Private accreditation organizations, such as The Joint Commission (2010), issue standards for patient disease self-management education, and Federal agencies, such as the Centers for Medicare and Medicaid, tie reimbursement to and display the results of patient education quality indicators by hospital on a public Web site called "Hospital Compare" (U.S. Department of Health and Human Services, 2010). This health care policy attaches an economic incentive to hospitals to provide for these quality controls, and it encourages the public to choose hospitals with the best quality indicators.

Patient education and self-care have theoretical underpinnings in the works of Henderson, Peplau, and Orem. According to Henderson (1991), the nurse meets the needs of the patient during periods of dependency; however, the nurse must also identify the learning needs of the patient and supply adequate knowledge based on that assessment to enable the patient to take over his own care and return to independence. Similarly, in Peplau's theory of interpersonal relations, the nurse is identified in the nurse–patient relationship as a resource person, teacher, and counselor to facilitate patient learning and promote experiences leading to health promotion (Reed, 2005). Central to Orem's self-care framework are nursing systems designed to assist the individual to continue to provide his or her own self care or care of dependent family members, thus reducing the length of time the individual requires health care services (Fawcett, 2000). In all three of these theoretical works, patient education is central to patient self-management and health promoting behaviors. In contemporary nursing care, clinical or critical pathways that include components of patient education assist in mapping the education plan to progress the patient along the trajectory from illness to wellness and return to the highest level of independence possible.

Research aimed at the effects of patient education has supported beneficial effects in many studies, particularly in chronic disease self-management. In a systematic review of 35 meta-analyses, comprising 598 studies and approximately 61,000 patients for chronic conditions including diabetes, asthma, COPD, hypertension, obesity, rheumatology, and oncology, the majority of the studies, or 64%, demonstrated improvement of patient outcomes because of therapeutic patient education (Lagger, Pataky, & Golay, 2010). Another meta-analysis for chronic disease self-management programs for older adults supported a beneficial effect on some physiologic outcomes, such as blood glucose control and blood pressure reduction in diabetes and hypertension; however, there was no evidence to support a beneficial effect on weight loss among diabetic patients or improved physiologic functioning among patients with arthritis (Chodosh et al., 2005). In another study, the combination of quality nursing care in a bariatric surgery practice along with effective patient education supported positive patient outcomes during the postoperative period for self-care, recovery, and successful weight loss (Grindel & Grindel, 2006). Although this study does not name a theoretical model, Henderson's theory of nursing in the provision of adequate support and education to transition patients to independence would fit. Other patient education research aims to reduce hospital recidivism in chronic disease. In one study, discharge nurses hired as part of the study worked with patients throughout their hospital stay to coordinate appointments and post discharge diagnostic testing, provide education related to medications and medication reconciliation, and conduct patient education with written materials. In addition, a pharmacist made telephone calls to the patients after discharge to reinforce medication education and the discharge plan, with a subsequent reduction of 30% rehospitalization rate within 30 days of discharge for the study participants (Jack et al., 2009). Although this study demonstrated a reduction in rehospitalization, it included an elaborate education plan that may prove to be complicated and challenging to continue long range because of limited staff time and patient census.

Health literacy in patient education is an emerging topic of research. There is a strong correlation between literacy levels and patient knowledge of disease self-management (Horner, Surratt, & Juliusson, 2000). Complex written patient care instructions and medication schedules are difficult for patients to comprehend. In addition, clinicians who provide verbal patient education using medical jargon may not be successful in providing quality education to patients. In this situation, patients may be too embarrassed to disclose that they do not understand the written or verbal instruction and thus be unable to comply with their treatment regime. As health care and technology used to treat patients become more complex, a future challenge will be conveying health care information to patients in a manner that is easily understood by the layperson.

There are many future opportunities and challenges in providing patient education in different formats to address varying learning styles. An evolving method for patient education delivery is interactive Web-based education programs aimed at providing plain language instructions easily understood by many populations. In addition, these programs are often provided in various languages to address the ethnic mix of different populations. Web-based programs provide a unique opportunity to allow for just-in-time training for informed consent before procedures, symptom management and instructions for care after discharge during hospital stays, and the availability to retrieve the education programs for review at home for patients who have home computers. With technology advances, this may spread to other electronic formats such as MP3 players and cell phones, allowing for more flexibility in the delivery of patient education for disease management as well as health promotion topics for the general population. The Internet allows for more access to health-related information, affording individuals the ability to easily research symptoms and disease information before seeking medical attention. The benefits when used appropriately may yield a more educated patient who may validate symptoms and seek medical attention. The challenge lies in Internet sites that may contain false or misleading information, which either provide wrong or potentially harmful information or solicit money for "miracle" products that may not be approved by the FDA, may not produce the advertised outcome, or may even be harmful.

Patient education is paramount in assisting patients to make informed decisions regarding their care, to establish healthy lifestyle behaviors, and to learn disease self-management during times of illness. Depending on the learning style of the individual, there are various ways to provide patient education through verbal, written, illustrative, and multimedia venues to enhance learning. With both health literacy and diverse ethnic mixes in population, careful attention is required to deliver information in a form that is easily understood. In addition, it is paramount to determine the level of understanding after providing patient education information. Return demonstrations for procedures reinforce immediate learning, assessing health literacy needs will determine whether written instructions are appropriate, and a mix of verbal teaching, illustrations, and multimedia may further engage the patient and his or her caregiver. The nurse as patient educator is a critical role that extends beyond the walls of an institution to the outside community and to advocate for health policy that will improve the care environment.

Alyson Blanck

PATIENT SAFETY

It has been more than a decade since the Institute of Medicine's (IOM) seminal report, *To Err Is Human*, which spotlighted the problem of patient safety and reported that tens of thousands of Americans die each year as a result of human error in the delivery of health care (IOM, 2000). In subsequent IOM reports, it was noted that care should be (1) safe, (2) effective, (3) patient centered, (4) timely, (5) efficient, and (6) equitable (IOM, 2001). Additionally, the IOM noted that nursing is inseparably linked to patient safety, emphasizing that poor working conditions for nurses and inadequate nurse staffing levels threaten patient safety and increase the risk of error (IOM, 2004). However, despite some impressive results by groups such as the Institute for Healthcare Improvement, patient safety remains a grave concern today.

Despite the slow pace of improvement, some of the lessons we have learned are incredibly powerful. The first is the concept of latent errors, which are defects in the design and organization of the system. Furthermore, to improve patient safety, we need to design systems that prevent adverse outcomes resulting from errors and near misses. The implication is that we need to standardize and simplify work systems and improve communication to eliminate errors and near misses.

There has been much research, and experts at the National Quality Forum (2004) reviewed the evidence and identified 30 evidence-based safe practices that all hospitals should follow (such as unit dosing, wrong-site protocols, deep venous thrombosis prophylaxis). Implementing them seems easy, but it is not. This has led to increased interest in evidence-based practice and dissemination and implementation science. The latter refers investigating how best to translate what we know into everyday practices.

Health care leaders and managers must strive to create nursing work environments that promote patient safety through use of evidence-based management strategies (Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996). Most clinicians are now exposed to the idea of evidence-based practice, defined as the conscientious, explicit, and judicious integration of current best evidence to inform clinical decision making, in their educational curricula. Yet, use of evidence-based practice by nurses in their daily clinical practice is limited (Estabrooks, 1998; Forsman, Rudman, Gustavsson, Ehrenberg, & Wallin, 2010; Kovner, Brewer, Yingrengreung, & Fairchild, 2010) and reflects the gap between research, clinical practice, and quality improvement. Organizational barriers such as lack of time and lack of autonomy are viewed as the main barriers to evidence-based nursing practice (Brown, Wickline, Ecoff, & Glaser, 2009). Evidence-based management implies that managers, like clinical practitioners, search for, critically appraise, and apply empirical evidence from management research in their practice. In doing so, managers send a clear message that research and practice are strongly connected and can structure work environments that promote staff confidence and skill for incorporation of an evidence-based approach as the standard for nursing clinical practice (Barnsteiner, Reeder, Palma, Preston, & Walton, 2010; Staffileno & Carlson, 2010).

In a seminal study on leadership, *transactional* leaders were differentiated from the more potent *transformational* leaders (Burns, 1978). Transactional leadership typifies most leader–follower relationships; it involves a "you scratch my back, I'll scratch yours" exchange. In contrast, transformational leadership occurs when leaders engage with their followers in jointly held goals. This leadership approach is recommended because it transforms all workers—both managers and staff—in the pursuit of the higher collective purpose of patient safety and quality care. There is increasing consensus that the organizational culture impacts patient safety and the quality of care (Gershon, Stone, Bakken, & Larson, 2004). Important aspects of safety cultures include communication, nonhierarchical decision making, constrained improvisation, training, and rewards and incentives (Committee on the Work Environment for Nurses and Patient Safety, 2004).

For more than a decade, research has documented a strong association between lower staffing levels and greater occurrence of adverse events. Inadequate nurse staffing has been associated with medication errors (Blegen & Vaughn, 1998), patient falls (Blegen & Vaughn, 1998; Krauss et al., 2005; Unruh, 2003), spread of infection (Fridkin, Pear, Williamson, Galgiani, & Jarvis, 1996; Kovner, Jones, Zhan, Gergen, & Basu, 2002; Stone, Pogorzelska, Kunches, & Hirschhorn, 2008), increased mortality (Aiken, Clarke, Sloane, Sochalski, & Silber, 2002; Estabrooks, Midodzi, Cummings, Ricker, & Giovannetti, 2005), and failure to rescue (Aiken et al., 2002; Needleman, Buerhaus, Mattke, Stewart, & Zelevinsky, 2002). A meta-analysis of 28 studies (Kane, Shamliyan, Mueller, Duval, & Wilt, 2007) that examined registered nurse (RN) staffing and patient outcomes link found significant association between RN staffing and lower odds of acute-care hospital-related mortality and adverse events, including hospital acquired pneumonia, unplanned extubation, respiratory failure, and cardiac arrest. On the basis of the studies included in the meta-analysis, patient and hospital characteristics, including hospitals' commitment to the quality of care, are likely contributors to the causal mechanism of the relationship between RN staffing and patient outcomes.

A line of research with a broader focus than staffing levels is the investigations involving Magnet hospitals (i.e., hospitals that attract nurses, hence the term Magnet). When Magnet hospitals were matched with control hospitals, controlling for case mix, Aiken, Smith, and Lake (1994) observed a Medicare mortality rate that was lower by 4.6 per 1,000 discharges (95% confidence interval, 0.9–9.4). However, besides the attainment of Magnet status, specifics were not identified. Magnet hospitals are known for higher nurse-to-patient ratios, lower staff turnover rates, and higher rates of nursing satisfaction. More recently, investigators found that nurses working in Magnet hospitals were significantly less likely to report jobs that included mandatory overtime (Trinkoff et al., 2010). Furthermore, other researchers have found the use of overtime to be adversely related to patient safety (Stone et al., 2007).

Nurses are in the position of being "at the sharp end" of health care interventions by being the patient's advocate, providing care that may result in an error, or witnessing the error(s) of other clinicians. Accidents, errors, and adverse outcomes result from a chain of events involving human decisions and actions associated with active failures and latent failures. Many of these failures are associated with individual performance that is impaired by stress, distractions/interruptions, and fatigue.

Information technology was identified by the IOM Committee on Quality of Health Care in America as critical in designing a health system that produces care that is safe, effective, patient centered, timely, efficient, and equitable (IOM, 2001). Nursing informatics defined by the American Nurses Association (2008) as the integration of nursing science, computer science, and information science to manage and communicate data, information, knowledge, and wisdom in nursing practice is critical in helping design better work environments. Nursing informatics research and practice is needed for efforts aimed at promoting patient safety in health care organizations. To this end, nursing informatics researchers and practitioners can play an important role in improving access to information (Currie et al., 2003; Newhouse, 2006), developing automated surveillance for real-time error detection and prevention (McCartney, 2006; Weir, Hoffman, Nebeker, & Hurdle, 2005), facilitating communication among members of the health care team (Kuziemsky et al., 2009), and developing clinical decision support (Anderson & Willson, 2008; Bakken, Cimino, & Hripcsak, 2004). Although the components of an informatics infrastructure are widely available to develop informatics applications that promote patient safety, today only 1.5% of U.S. hospitals have a "comprehensive electronic-records system" (Jha et al., 2009).

Organizational and individual commitment to improving patient safety requires effective leadership and proactive interventions. Patient safety improvements need to draw from qualitative and quantitative research describing work processes and responsibilities, methods to improve performance respecting human limitations, and designs of patient safety supportive communication and team approaches to health care delivery.

Patricia W. Stone
Arlene Smaldone
Robert Lucero

PATIENT SATISFACTION

Patient satisfaction is a compelling topic in the current health care environment when cost, financial viability of organizations, quality, and empowerment of consumers are major considerations. Patient satisfaction is defined as the degree to which the patient's desired goals and expectations are achieved (Fitzpatrick and Hopkins, 1983; Mahon, 1996). Eriksen (1995) defined patient satisfaction with nursing care as "the patient's subjective evaluation of the cognitive-emotional response that results from the interaction between the patient's expectations of nursing care and their perception of the actual nurse behaviors/characteristics" (p. 71). Studies indicate that nursing care is a key determinant in overall patient satisfaction in the hospital setting (Abramowitz, Cote, & Berry, 1987; Beck & Larrabee, 1996; Greeneich, 1993; Jacox, Bausell, & Mahrenholz, 1997).

Donabedian (1988) proposed a framework in evaluating the quality of health care. The quality of health care is viewed from the perspectives of structure, process, and outcome. Patient satisfaction is considered an important quality indicator (Wagner & Bear, 2009) and outcome of care (Press, 2006; Woodring et al., 2004).

The importance of patient satisfaction as a quality indicator has been mandated by regulatory and accreditation bodies in nursing and in health care. Health care organizations such as the Joint Commission and the National Committee on Quality Assurance require measurement and monitoring of patient satisfaction (Joint Commission, 2010). The Patient Protection and Affordable Care Act of 2010 have provisions to ensure the delivery of quality care, quality measurement, data collection, and public reporting. It includes the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS, 2010) among the measures to be used to calculate value-based incentive payments beginning October 2012.

The HCAHPS survey developed and tested by the Centers for Medicare and Medicaid Services in partnership with the Agency for Healthcare Research and Quality is the first national, standardized, publicly reported survey of the patients' perspectives of hospital care. The HCAHPS survey asks patients 27 questions about their recent hospital stay 48 hours to 6 weeks after discharge. The survey contains 18 core questions and eight aspects of the patients' hospital experiences such as communication with doctors, communication with nurses, responsiveness of hospital staff, pain management, communication about medicines, discharge information, cleanliness of the hospital environment, and quietness of the hospital environment. The survey also includes four screener questions and five demographic items, which are used for adjusting the mix of patients across hospitals and for analytical purposes. The survey can be administered by mail, telephone, mail with telephone follow-up, or active interactive voice recognition. Hospitals can use the HCAHPS survey alone or include additional questions to the core HCAHPS items. Hospitals are required to survey patients monthly (HCAHPS, 2010).

The American Nurses Association implemented the Nursing Care Report Card for Acute Care that includes nursing-sensitive quality indicators such as patient satisfaction with overall care, nursing care, education, and pain management (Moore, Lynn, McMillen, & Evans, 1999; Woodring et al., 2004). The Magnet Recognition Program identified 14 forces of magnetism over 5 years ago, which focused more on structure and process (American Nurses Credentialing Center, 2008). In 2007, a new model focusing on outcomes was developed. In the new model, four categories were identified. These categories were patient outcomes, empirical quality outcomes, nurse organization, and consumer outcomes. Patient overall satisfaction and patient satisfaction with nursing care, educational information, and pain management were patient outcome indicators (American Nurses Credentialing Center, 2008).

Research on patient satisfaction with nursing care included the development of patient satisfaction models and the development, refinement, and use of patient satisfaction instruments. Few studies were done on patient satisfaction before the 1970s. Abdellah and Levine (1957) interviewed patients to identify satisfying and unsatisfying events during hospitalization. An instrument was developed on the basis of these patient-identified events. Seven dimensions were identified, indicating satisfaction with care, rest and relaxation, dietary needs, elimination, personal hygiene and supportive care, reaction to therapy, and contact with nurses. Tagliacozzo (1965) found that patients were sensitive to the personality and attitudes inferred from nurse behavior. Ware, Davies-Avery, and Stewart (1978) reviewed 111 studies over a 25-year period. They developed a taxonomy of patient satisfaction that initially included the art of care, technical quality of care, accessibility/convenience, finances, physical environment, availability, efficacy, and continuity. After years of further study, these dimensions were refined to six dimensions. These dimensions are nursing and daily care, hospital environment and ancillary staff, medical care, information, admissions, and discharge and billing (Ware & Berwick, 1990).

More patient satisfaction studies were done with the advent of the quality and outcomes movement in the 1980s and the 1990s. However, few models of patient satisfaction were developed. Linder-Pelz (1982) developed a model of patient satisfaction which postulated that patient's expectations of care, health care values, sense of entitlement, and interpersonal comparisons of care were antecedents of positive evaluations of care. When tested, only 8% of the variance in patient satisfaction was explained. Greeneich (1993) proposed a model describing characteristics of the nurse, patient, and organization that influence patient satisfaction. This model has not been tested. Comley and Beard (1998) proposed a theory of patient satisfaction derived from job satisfaction models. This model has not been tested in a prospective study.

Risser (1975) created the Risser Patient Satisfaction Scale (PSS), an instrument to measure patient satisfaction. The PSS consisted of 25 questions and three subscales, namely, technical/professional, educational relationship, and trusting relationship. The PSS served as a basis for the development of other instruments (Hinshaw & Atwood, 1982; La Monica, Oberst, Madea, & Wolf, 1986; Munro, Jacobsen, & Brooten, 1994).

Patient satisfaction instruments were developed or refined to make the instrument less cumbersome, to measure a specific nursing behavior, to measure patient satisfaction in a specific setting or language, and to measure patient satisfaction to different health care providers. Larson and Ferketich (1993) developed the CARE/SAT, a 29-item instrument that measures patient satisfaction with regard to nurses' caring behavior. Marsh (2003) compared patient satisfaction with health care providers from different disciplines working in the same clinical setting using the Patient Satisfaction with Health Care Provider Scale. Eriksen (2003) revised the Patient Satisfaction with Nursing Care instrument into the Revised Patient Satisfaction with Nursing Care. The purpose of the revision was to develop a reliable and valid measure that was simpler to use. Eriksen and Witter (2003) translated the Revised Patient Satisfaction with Nursing Care instrument in Spanish in response to answers written in Spanish in the English version of the instrument and the rising number of Hispanics living in the United States. Measurement of patient satisfaction was generally limited to English literate participants. Appropriately, Centers for Medicare and Medicaid Services proactively developed the HCAHPS survey in English, Spanish, Chinese, Russian, and Vietnamese (HCAHPS, 2010).

Major challenges in the research of patient satisfaction with nursing care are related to its conceptualization and measurement. Models of patient satisfaction that reflect the structure, process, and outcomes of nursing care need to be developed and empirically tested. Majority of patient satisfaction instruments are not based on theoretical models (Laschinger & Almost, 2003).

This can be explained by the lack of theoretical models of patient satisfaction.

One issue related to measurement of patient satisfaction with nursing care is the lack of psychometrically tested, valid, and reliable instruments (Lynn & McMillen, 2004; Urden, 2003; Woodring et al., 2004; Yellen, 2003). A second issue is the lack of consideration for demographic factors such as age, educational level, and ethnic and cultural background in the development of instruments. A third issue is the development of instrument from the perspective of the provider and not the patient (Lynn & McMillen, 2004). Finally, issues related to methodology, survey design, administration techniques, and timing are of concern (Urden, 2003). These issues need to be addressed.

An issue not directly related to conceptualization and measurement of patient satisfaction is the lack of inclusion of nurses in the development of instruments and the exclusion of nurse-sensitive indicators in hospital quality reports (Yellen, 2003). There is a high correlation between patient satisfaction with nursing care and satisfaction with overall care (Beck & Larrabee, 1996; Jacox et al., 1997). For this reason, nurses need to be active participants in quality reporting and in the development of patient satisfaction instruments.

In summary, patient satisfaction is a critical outcome indicator. It impacts both the quality and financial aspects of health care organizations. Nurses are major contributors to the level of patient satisfaction. These contributions need to be measured and recognized.

Cecilia D. Alvarez

PEDIATRIC PRIMARY CARE

Pediatric primary care has existed for a long time and has been provided by family practice physicians and pediatricians. In the last 25 years, primary care has changed to include pediatric nurse associates who are now called pediatric nurse practitioners (PNPs). PNPs were the first nurse practitioners; they are advanced practice nurses who are educated to provide primary care services to children. Dr. Henry K. Silver and Dr. Loretta Ford started the PNP program in Colorado in 1964. Although the role has remained much the same from its inception, one major change is the level of education required. Originally, it was a 4-month continuing education program and now it is a 2-year educational program culminating with a master's degree. National certification is required in some states to allow PNPs to practice. There are two certifying organizations for PNPs: the American Nurses Credentialing Center and the Pediatric Nursing Certification Board.

Currently, there are differences in health care outcomes between minority and majority ethnic groups. Children in minority groups are at much greater risk for poor health care factors, and there is a lack of culturally competent health care providers. Hispanic and Black children are more likely to be uninsured and receive lower quality primary care than White children (Flores & the Committee on Pediatric Research, 2010). In 1998, President Clinton presented the Initiative to Eliminate Racial and Ethnic Disparities in Health. This proposal seeks to eliminate disparities by the year 2010 and focuses on the same goals and outcomes as Health People 2010: infant mortality, child and adult immunizations, HIV/AIDS, diabetes, cardiovascular disease and stroke, and cancer screening and management. Access to health care and quality of health care are also part of the focus.

Childhood immunizations, particularly in children less than 2 years of age, continue to be a major health concern in primary care. Health People 2010 and the President's Childhood Immunization Initiative mandated a goal of 90% immunizations for children younger than 2 years by the year 2000. In 1992, only 55% of children under the age of 2 years had received an adequate number of immunizations. By 1994, the rate had risen to 73%, and now it is above the 90% goal. Although these are excellent numbers, there still remain pockets primarily in large cities where immunizations rates are much lower. Data from the CDC National Immunization Survey suggest that minority children, primarily African American and Hispanic, children living below the poverty level, children of teen mothers, children in large families, children of parents who lack education, families with transportation problems, and children of mothers who lack social support have lower rates of receiving immunizations by age 2 years than the national average.

Obesity is another health issue commonly seen in primary care. It is a complex issue and not fully understood. The number of obese children has increased substantially in the last 20 years, putting them at risk for serious health problems as adults including cardiovascular disease and stroke, diabetes, hypertension, arthritis, and psychological problems. Obesity during infancy and childhood increases the risk of obesity in adolescence and adulthood. Children with a body mass index equal to or more than the 95th percentile are more likely to become obese adults. Obesity is considered to be multifactorial with both genetic and environmental components. Family lifestyle, stress, socioeconomic status, and maternal characteristics are some of the environmental components. Sowan and Stember (2000) studied infants until 15 months of age to identify parental characteristics and to see whether obesity was linked to any of these characteristics. Age of the mother at the time of the infant's birth was predictive of obesity in the infant at 10 months of age. The chances of obesity increased in the infant with every 5 years of age increase in the mother. For every 25 pound increase in the mother's usual weight, the chances of the infant being obese at 7 months of age increased. Maternal smoking increased the chances of infant obesity at 1 and 7 months of age. The usual stressors one might think could cause childhood obesity such as family stresses, socioeconomic status, and family life were found not to be significant predictors.

Faulkner (2002) studied 18 mothers of preschool children enrolled in a nutrition clinic for mothers and children in low-income households. Mothers were questioned in a 1-hour focus group as to how they defined overweight, how they thought their children became overweight, and what barriers existed in preventing and managing obesity. Interestingly, the mothers described their children as strong or solid and did not think that standardized growth charts reflected a healthy weight. As long as children were active, the mothers did not consider them overweight but if they were lazy or lay around then they were considered overweight. The mothers thought that heredity and the environment determined the child's weight. In their attempts to manage their children's weight, the mothers had lots of difficulty. Food was used as a reward by some, others did not want to deny their children food, and with others, family members did not want the mother restricting the child's diet. Mothers also thought that their own obesity affected their management of their child's weight.

Prevention of obesity and development of effective programs for those who are overweight are critical to reversing the devastating long term effects. Unfortunately, there are not many effective programs available for children. Dietary management, increasing physical activity, and parental behavior management are critical ingredients in any program. Primary care providers need to include appropriate eating patterns, types of foods, and amounts when talking with parents during well-child visits. Parents have a crucial role in how children's eating habits develop and how that affects their overall health and psychological well-being. Providers also need to discuss the amount of physical activity children receive. Children should receive 60 minutes of physical activity per day, but where a family lives influences where and how parents are able to ensure children receive this. Providers need to be aware of safe community resources to guide families.

Anderson and Whitaker (2010) studied preschool-aged children exposed to three household routines of eating the evening meal as a family, getting enough nighttime sleep and having limited screen time. These children had a 40% lower incidence of obesity than those who did not have these routines.

It is imperative that adequate and appropriate health services are available to children and families to help ensure positive outcomes. A variety of health care providers, including nurse practitioners with knowledge of the needs of children, is essential for changes to occur.

Virginia Richardson

PENDER'S HEALTH PROMOTION MODEL

Pender's Health Promotion Model (HPM) is a middle-range theory that explains and predicts how the complex interaction among perceptual and environmental factors influences health-related choices. Pender focused the model on high-level wellness and health promotion. The model has been used internationally as the basis for nursing research, practice, and education.

Since her first published model in 1982, Pender has made two major revisions to her model resulting in a 1987 version and a 1996 version. The revised version has shown to be a better predictor of health-related behavior change in nursing research, such as predicting physical activity in adolescents and predicting the use of hearing protection in construction workers (Ronis, Hond, & Lusk, 2006; Wu & Pender, 2005). The text based on Pender's HPM, *Health Promotion in Nursing Practice*, is currently in the sixth edition (Pender, Murdaugh, & Parsons, 2010).

The 10 major theoretical propositions of the revised HPM collectively state that individual characteristics and beliefs will influence the person's level of commitment and likelihood of demonstrating the desired health promotion behavior. These interrelated variables are represented in Pender's revised HPM conceptual map (1996); related variables are clustered and separated into three main categories: individual characteristics and experiences, behavior-specific cognitions and affect, and behavioral outcome (Pender, Murdaugh, & Parsons, 2002).

The antecedents to action are the individual characteristics and experiences, which include variables that have been determined by past experiences, genetics, or biopsychosocial influence. These variables can influence behaviors, beliefs, and outcomes. The most substantial part of the model is composed of variables based on beliefs and outside influences that are fused together under the heading "Behavior Specific Cognitions and Affect." This category includes propositions that people will be more successful if they anticipate benefit, perceive self-efficacy, and have a positive affect toward the health promotion goal. The expectations of significant others (family, peers, and health care providers), the external environment, and the competing demands (distractions) and preferences can influence attainment of the health promotion behavior. Both of these groupings are related to the last cluster of variables termed the *behavioral outcome*. The desired outcome is the health promotion behavior, which is influenced by competing demands and making a commitment to changing behavior. The level of commitment to a plan of action both influences the outcome and may predict the ability to maintain the desired health promotion behavior change over time (Pender et al., 2002).

Pender's HPM has been used in research, clinical practice, and nursing education. Hundreds of published nursing articles have used the model as a theoretical framework. Research based on the HPM covers a variety of clinical applications such as the use of hearing protection, smoking cessation, exercise, sexual behaviors and contraceptive use, dietary goals and cholesterol levels, use of seat belts, job strain/absenteeism/productivity, stress reduction, cancer risk reduction, accessing prenatal care, avoiding secondhand smoke, and diabetes prevention. Pender states that she primarily uses the model to study exercise behaviors in adolescents and young adults (Pender, 2001b). Nursing implications derived from the HPM research offer specific nursing interventions that can be readily used in clinical practice. Information about how to promote healthy choices and lasting behavior modification is valuable to both health care professionals and the public. Pender has also published an article specifically outlining health promotion recommendations for BSN, MSN, and PhD nursing curricula (Pender, Barkauskas, Hayman, Rice, & Anderson, 1992).

The HPM offers a high degree of generalizability to many diverse groups of people. Pender has consulted internationally in such countries as Japan, Korea, Dominican Republic, Jamaica, England, New Zealand, and Mexico (Pender, 2001a, Biographical sketch). The HPM is available in several languages including English, Spanish, Japanese, and Korean translations (Pender, 2001a). Research based on the model has tested both males and females at all ages from preschool children to older adults. Research participants have been from a variety of settings including inpatient, outpatient, primary care, and community dwellings. Most importantly, the research based on the HPM has not been limited to healthy subjects. Some populations that have been studied have included people diagnosed with CAD, HIV, asthma, cancer, hypertension, cognitive disorders, and chronic disease.

Strengths of the HPM include its use of concepts that are logical and basic, its generalizability, and its usefulness in research and clinical practice. Pender's model also addresses the barriers to action that are important areas to focus nursing intervention. Lastly, Pender has taken a truly holistic approach, considering sociocultural, psychological, and biological variables. The content of the HPM model is consistent with contemporary beliefs that health promotion is a national and international priority and a cost-effective alternative to sick care.

Caryn A. Sheehan

PEPLAU'S THEORETICAL MODEL

Hildegard Peplau (1909–1999) formulated her theoretical ideas about the therapeutic interpersonal process of nursing in the 1940s and published them in the now-classic 1952 book, *Interpersonal Relations in Nursing.* The foundation of Peplau's work was interpersonal relationships with patients as the significant context in which nurses facilitate patients' well-being. Peplau's theoretical model can be categorized as a middle-range theory. The theory has a specific focus on the characteristics and process of the therapeutic relationship as a nursing method to help manage anxiety and foster healthy development. Through the therapeutic relationship, the patient develops resources for healthy behaviors by actively participating with the nurse in a developmental process of change.

Through the therapeutic relationship, the nurse uses a complex set of knowledge and skills (interpersonal competencies, investigative skill, and theoretical knowledge) along with patient strengths and characteristics to assist the patient in using energy provided by the anxiety to identify and grow from a problematic situation (O'Toole & Welt, 1989; Reed, 2005). The nurse–patient relationship is fundamental to providing nursing care and derives from the human need for connectedness that is still relevant in the twenty-first century (Peplau, 1997). Through this interpersonal relationship, nurses assess and assist people (a) to achieve healthy levels of anxiety intrapersonally and (b) to facilitate healthy pattern integrations interpersonally, with the overall goal of fostering well-being, health, and development.

The structure of the interpersonal relationship was originally described in terms of four phases: orientation, identification, exploitation, and resolution (Peplau, 1952). Forchuk (1991b), with the support of Peplau, clarified the structure as consisting of three main phases: orientation, working (which incorporated identification and exploitation), and resolution. In a 1997 publication, Peplau endorsed this three-phase view and explained that the phases were overlapping, each having unique characteristics. Throughout these phases, the nurse functions cooperatively with the patient in the nursing roles of stranger, resource person, counselor, leader, surrogate, and teacher. The nurse's range of focus includes the patient in relationship with the family, other health care providers, and community (Peplau, 1952, 1997).

Peplau was explicit in promoting research-based theory. Research based on Peplau's theoretical model has addressed topics related to both nurse behaviors and patient health conditions. Nurse-focused topics include: (a) the practices of psychiatric mental-health nurses, (b) the family systems nursing, and (c) the nature of the nurse–patient relationship in reference to roles and role changes over the trajectory of a mental illness, boundary issues in pediatric nursing, and concepts such as therapeutic intimacy. Patient-focused research has addressed health conditions including depression, psychosis, sexual abuse, Alzheimer's disease, and multiple sclerosis. A particularly notable Peplau-based researcher is Forchuk (e.g., Forchuk, 1994; Forchuk et al., 1998; Forchuk, Jewell, Tweedell, & Steinnagel, 2003), who, along with colleagues, has conducted a program of research into applications of the interpersonal relationship process in psychiatric mental-health nursing care. Peden (1998) and her colleagues (e.g., Peden, Hall, Rayens, & Beebe, 2001) have conducted several studies on depression in college-age women in which they found Peplau's theory on phases of the relationship to be significant in the timing of their depression intervention.

Research has generated policy implications. The studies by McNaughton (2005) of pregnant women at risk and by Beeber et al. (2010) of Latina mothers with depressive symptoms had policy implications for increasing the standard number of visits to better facilitate positive mental and physical health outcomes of the therapeutic relationship. Although much of the research has focused on psychiatric and mental health settings, increasingly researchers are studying applications of the theory in other contexts (Nyström, 2007). Peplau's theoretical ideas continue to be significant in contemporary nursing for their relevance not only in psychiatric mental-health nursing practice but also in practice anywhere a nurse–patient relationship exists.

Pamela G. Reed
Nelma B. C. Shearer

PET THERAPY

Using animals as an adjunct to treatment has been practiced by a variety of professionals including registered nurses, nurse practitioners, physicians, physical and occupational therapists, social workers, psychologists, and licensed counselors (Delta Society, 2005; Kruger & Serpell, 2006).

Nursing, with its broad biopsychosocial framework for disease management, makes it an optimal venue for animal-assisted therapy practice. As clinicians, nurses are amenable to using nontraditional practices in an effort to heal and provide comfort for their patients. In addition, nursing research focuses on understanding the symptoms of acute and chronic illness, finding ways to prevent or delay chronicity of physical or emotional illness and finding overall approaches to achieve and maintain good physical and emotional health. In other words, nurses understand the interconnectedness between emotional, mental, and physical health and through alternative modalities can reduce or ameliorate stressors, allowing the body to do what it was designed to do—heal.

Nursing's unique role in both the psychological and the physiological dimensions of disease and stress places it in an ideal position to examine and use the role of companion animals in clinical interventions. Practitioners of animal-assisted therapy or animal-assisted activities are often involved in pet visitation and animal-facilitated therapy programs in hospitals, nursing homes, hospice, assisted living centers, and more (Spence & Kaiser, 2002). Research has demonstrated that animal-assisted interventions and therapies have been highly effective among young hospital patients, troubled adolescents, individuals with acute or chronic illnesses, dementia, Alzheimer's disease and elderly residents living in long-term care facilities.

Despite the long history of using therapeutic animals, the custom of animal-assisted therapy is still being defined today. Literature searches reveal dozens of definitions of animal-assisted therapy and at least 12 different terms for the same practice including pet therapy, pet psychotherapy, pet-facilitated therapy, pet-mediated therapy, and so forth.

The most commonly used terminology is animal-assisted therapy (AAT) and animal-assisted activities (AAA). The Delta Society, one of the largest organizations in the country responsible for certifying therapy animals (Kruger & Serpell, 2006), provides definitions that are cited consistently throughout the AAT and the AAA literature. The Delta Society defines AAT as a goal-directed intervention by a health or human services professional that uses animals to achieve specified goals and objectives through measured progress. Also used are AAA, which are more commonly used in hospitals through infrequent pet visits. The difference lies in the absence of predetermined treatment goals and inconsistent practice.

Dogs are most frequently used in AAT/AAA because of their general social nature, trainability, and size; however, horses are used extensively in a variety of remedial fields. Horses are categorized and certified by the Delta Society, but overall jurisdiction resides within the North American Riding for the Handicapped Association, its subsection the Equine-Facilitated Mental Health Association, and its affiliate partner the American Hippotherapy Association (AHA). Equine-facilitated psychotherapy is facilitated by a credentialed health professional working with a credentialed equine professional. Hippotherapy, which is often incorrectly used synonymously with equine-facilitated psychotherapy, uses neurodevelopmental treatment and sensory integration based on the movement of the horse to improve balance, coordination, fine motor skills, posture, improving articulation, and increasing cognitive skills (Kruger & Serpell, 2006).

Historically, AAT and AAA are believed to have been practiced as early as the ninth century in Gheel, Belgium, with handicapped persons (Serpell, 2000). Other research has documented the use of AAT and AAA in the late 1790s in York, England, where rabbits and chickens were used as complementary modalities to therapy with the mentally ill to teach self-control without the use of restraints or harsh medicines (Arkow, 1987; Salotto, 2001). During the 1830s, mental institutions in Britain used animals on the grounds to create a more pleasant environment (Serpell, 2000). Even Florence Nightingale used small animals in her care of wounded soldiers during the Crimean War. In her *Notes on Nursing*, she posited that a "small pet is often an excellent companion for the sick, especially for the chronic cases" (Nightingale, 1969; Serpell, 2006). In 1962, child psychiatrist Boris Levinson used his own dog, Jingles, to help him connect with hard-to-reach children and adolescents. He published his findings "The Dog as the Co-therapist" in the journal of *Mental Hygiene* (Levinson, 1962).

In 1988, at the National Institutes of Health Technology Assessment Workshop on the Health Benefits of Pets, major evidence was reported indicating that pet owners had an increase in 1-year survival rates after being discharged from a coronary care unit (Beck & Hatcher, 2003; Morrison, 2007), demonstrating that pet ownership is a significant social predictor of 1-year survival for post coronary patients studied. Ten years later, in a clinical trial ancillary study to the Coronary Arrhythmia Suppression Trial by the National Institutes of Health, researchers reported that pet owners had slightly lower systolic blood pressures, plasma cholesterol, and triglyceride values than non–pet owners (Beck & Hatcher, 2003). Combined, the study purports that because of pet ownership's influence of psychosocial risk factors, having a loved pet reduces the incidence of cardiovascular disease (Beck & Hatcher, 2003).

Benefits of AAT/AAA have demonstrated both physical and fiscal outcomes. Employing the use of animals has been shown to be a cost effective intervention in a variety of health care settings through shorter hospital stays, reduction in need for medication and an increase in food consumption resulting in a decrease in need for supplements. A study conducted in New York, Missouri, and Texas showed that in nursing homes where animals and plants are an integral part of the environment, medication costs dropped from an average of $3.80 per patient per day to just $1.18 per patient per day (Geisler, 2004).

Animals also provide the necessary social support as well as increase the frequency of this type of support to individuals who consider their pet to be a friend, a family member, and a confidant (Beck & Hatcher, 2003). For individuals with a human social support deficit, pets can moderate an intimacy with other humans. For the elderly who live alone, animals play a positive role in the improvement of life satisfaction, sense of purpose, and feelings of personal safety compared with non–pet owners (Beck & Hatcher, 2003).

In using dogs therapeutically, even one session of 30 minutes per week has been demonstrated to be clinically significant in reducing feelings of loneliness per patient self-reports. Other measured benefits include decreased blood pressure and heart rate as well as an increased peripheral skin temperature (McCabe, Baun, Speich, & Sangeeta, 2002). Patients with Alzheimer's disease who have an attachment to a companion animal have fewer mood disorders and fewer episodes of anxiety and aggression compared with those without a loved pet (McCabe et al., 2002).

From a physical health perspective, individuals with companion animals have a lower frequency of primary care visits (Siegel, 1990). Stressful life situations contribute to higher physician visitation rates because of the stressors interconnectedness with psychological distresses. The more stressors experienced, the greater attention paid and significance attributed to physiological symptoms, thus more trips to the family physician. Individuals encountering meaningful interactions with animals saw improved moods and faster recovery times (Coakley & Mahoney, 2009).

Feelings of loneliness and isolation are common in residential facilities—whether in prisons, youth detention centers, hospitals, nursing homes, or assisted living. The physical separation from loved ones (through spousal loss, loss of home) often triggers the onset of loneliness and the need for social relationships (Banks & Banks, 2002; Geisler, 2004). Residents in nursing homes who received regular pet visits had lower scores for loneliness than those with a low level or no contact

(Banks & Banks, 2002). Animal-assisted therapies distract patients from pain perception and often provide comforting thoughts of home (Coakley & Mahoney, 2009). Rather than feeling lonely, the dogs made them feel connected and cared for and provided them with a sense of purpose.

It is attachment to another being that is associated with greater physical health. Pets provide companionship and feelings of security and of being loved (Siegel, 1990). Further research has found a decrease in anxiety, systolic pulmonary pressure, and epinephrine and norepinephrine levels (Coakley & Mahoney, 2009) in individuals with pets.

Alzheimer's disease provides specific challenges for caregivers that require alternative interventions. These challenges include agitation, aggression, delusions, hallucinations, sleep problems, wandering, and vocalizations. Agitation affects more than 90% of the residents, which inhibits optimal health care (Richeson, 2003). This concern continues to escalate as the Alzheimer's Association predicts that by 2050, there will be 14 million people affected by Alzheimer's disease.

For individuals with Alzheimer's disease, sensory-based techniques have been used successfully to promote independence, to decrease medications and need for physical restraint, and to improve the quality of life (McCabe et al., 2002). Settings that are secure and comforting, featuring a myriad of sensory stimuli, are most effective for these residents. The success of using companion animals stem from those factors. McCabe et al. (2002) posited that when a dog was present on the unit from morning to evening, results showed the resident to be less violent, have fewer conflicts, need less medication, and have more acceptable behavior as well as decreased agitation and improved socialization during sundown hours, very similar to the aforementioned study at the institution where the residents cared for the injured bird.

Whether it is because of the bond with a nonjudgmental being or finding a sense of purpose or a connection to nature, almost any animal can have a therapeutic impact. Using animals other than dogs might be more acceptable in certain settings, such as fish tanks used to improve morale and eating habits. Research by Edwards and Beck (2002) has found that the presence of fish in a nursing home dining room provided a positive influence for Alzheimer's patients as residents sat at the table longer and consumed more calories, which meant a weight gain of 1.65 pounds and less need for nutritional supplements; patients felt it provided a nice distraction during prolonged hospital stay and felt less anxiety, depression, and hostility typically seen in patients awaiting a heart transplant.

Pets in nursing homes encourage an increase in the level of social interaction between people. Increase in social and verbal interaction provides a valuable adjunct to other therapy (Geisler, 2004). Residents can experience themselves as nurturer and caregiver rather than the recipient (Geisler, 2004).

At the other end of the life span, animal-assisted interventions have been successful in working with chronically ill children. Companion animals have been found to provide companionship and tactile comfort, to decrease stress, and to facilitate social interaction as well as decrease cardiovascular reactivity to stress. Companion animals serve as playmate, confidante, and friend who provide unconditional love, a direct source of social support (Spence & Kaiser, 2002). The bond children have with companion animals has been positively related to improved self-esteem, social competence, and socioemotional functioning. Pets as social facilitators based on findings that animals make a person more socially attractive and provide a topic for conversation could be important for chronically ill children who may feel different and whose social life maybe interrupted (Spence & Kaiser, 2002).

AAT is not theory specific; therefore, a variety of theories can be used. Common theories cited and often supported in AAT include but are not limited to attachment theory, attention egens, Rogerian theory, biophilia hypothesis, learning theory, social mediation theory, object relations theory, and cognitive theories. Table 5 gives a brief overview of theories that have been used in AAT literature.

Although the use of animal-assisted interventions dates back hundreds of years, the amount of empirical evidence supporting its effectiveness is minimal. There are countless articles that provide heartwarming anecdotes, but because most of the work is done by individuals outside the academic world, resources to conduct such extensive research are not sufficient (Beck & Hatcher, 2003).

Most of the studies that have been conducted were nonexperimental, and although samples were large enough, most were nonprobability, nongeneralizable samples (Wilson & Barker, 2003).

Isolating variables to show the animal as the catalyst for change is often difficult. Beck and Hatcher (2003) wrote that there are

Table 5

Overview of Theories Used in AAT Literature

John Bowlby's attachment theory	Sable (1995)	Attachment theory contends that infants develop a unique and continuous attachment to a caregiver. As they grow, they need a combination of relationships from attachments built with other individuals. Pets can be used as surrogate relationships. "Humans have an innate, biologically based need for social interaction—behaviors such as following, smiling toward, holding and touching are evident in reciprocal relationships between child and attachment figure" (Kruger & Serpell, 2006).
Attention egens	Odendaal (2000)	Humans have a basic need for attention. The bond between human and animal correlates to the animals' need for attention and sociable behavior. When animals fulfill this need for attention, success is measured.
Rogerian theory	Coakley and Mahoney (2009)	Stress interferes with recovery; thus, energy fields are dynamic and reciprocal—changes in one can change the other. Carl Rogers describes living matter as energy fields. Energy fields include body, mind, emotions, and environment. When an animal is introduced into the patient's energy field, the person experiences change.
E. O. Wilson's biophilia hypothesis	Kruger and Serpell (2006)	Developed by E.O. Wilson in 1984, the biophilia hypothesis maintains that humans possess a genetically based propensity to attend to and to be attracted by other living organisms or "an innate tendency to focus on life and lifelike processes" (Kruger & Serpell, 2006).
Bandura's learning theory	Brickel (1982)	Learning theory states that an activity that is pleasurable will be self-reinforcing and more likely to occur in the future—unpleasant or anxiety-provoking activities may result in avoidance or withdrawal of the behavior. Animals introduced in a therapeutic context may serve as a buffer and divert attention from an anxiety generating stimulus that the patient faces (Brickel, 1982).
Cognitive and social cognitive theories	Kruger and Serpell (2006)	Cognitive and social cognitive theories are continuous reciprocal relationships among a person's cognitions, behavior, and environment (i.e., if I think I'm a bad person, I will behave like a bad person and will therefore be treated like a bad person by those around me)—the goal of therapy is to bring about positive changes in person's self-perception and hence their behavior.

inconsistencies within the literature, and as a result, the magnitude of the health benefits may be over or underestimated, begging the question as to whether the populations that benefit would faire just as well enjoying other living environments like gardening or walking in green spaces, and so forth. Even rigorous experimental designs used in natural settings are subject to intervening variables that are outside of the researchers' control (Wilson & Barker, 2003). Other considerations include sample selection within specific populations (i.e., patients with Alzheimer's disease), which makes randomization meaningless (Wilson & Barker, 2003) and is not always accurate in generalizing groups from one facility to another.

With that being said, Beck and Hatcher (2003) concluded that the available data do suggest that animals play a significant role in benefiting the lives of humans, and despite the deluge of anecdotal evidence and relatively fragile empirical data, the field of AAT continues to be vibrant and alive in a variety of clinical and nonclinical settings. In an effort to make the practice more mainstream and accepted throughout the various disciplines, current practitioners conducting evidence-based research are needed to provide well-designed research studies to further scientifically demonstrate the efficacy that so many have experienced while using animal-assisted interventions.

Amy R. Johnson

PHENOMENOLOGY

Phenomenology refers to both a philosophical movement and a research method. The philosophical underpinnings of phenomenology are first summarized to provide a backdrop for what this methodology aims to accomplish. One of the philosophical tenets of phenomenology is intentionality, which refers to the inseparable connectedness of human beings to the world. Subject and object are united in being-in-the-world. One cannot describe either the subjective or objective world but only the world as experienced by the subject. The observer is not separate from the observed. One can know what one experiences only by attending to perceptions and meanings that awaken conscious awareness. Phenomenologists hold that human existence is meaningful only in the sense that persons are always conscious of something. Meaning emerges from the relationship between the person and the world as the person gives meaning to experiences. Phenomenology focuses on lived experience, that is, human involvement in the world.

In phenomenology, the process of recovering our original awareness is called reduction. Through phenomenological reduction, one refrains from preconceived notions and judgments. The layers of meaning provided by a researcher's knowledge and interpretation are preserved by being temporarily set aside—that is, bracketing. Through phenomenological reduction, the world of everyday experience becomes accessible.

Edmund Husserl is considered the father of phenomenology. His is a descriptive phenomenology. He was interested in the epistemological question, How do we know about man? The goal of his phenomenology is the description of the lived world. Husserl's student, Martin Heidegger, took phenomenology in a different direction and was more interested in the ontological question, What is being? The goal of his phenomenology, called hermeneutic phenomenology, was understanding. This understanding is achieved through interpretation. Heidegger argued that it was not possible to bracket one's being-in-the-world.

The phenomenological philosophies of Husserl and Heidegger have different methodological implications for nurse researchers. Husserlian phenomenology focuses on the analysis of the subject and object as the object appears through consciousness. Bracketing is essential in this descriptive phenomenology. In Heideggerian phenomenology, bracketing is not used because this phenomenology views people as being-in-the-world. This notion of being-in-the-world allows researchers to bring their experiences and understanding of the phenomenon under study to the research.

As a research method, phenomenology is inductive and descriptive. Phenomenology provides a closer fit conceptually with clinical nursing and with the kinds of research questions that emerge from clinical practice than does quantitative research. The goal of phenomenological research is to describe the meaning of human experience. In its focus on meaning, phenomenology differs from other types of research, which may, for example, focus on statistical relationships among variables. Phenomenology tries to discover meanings as persons live them in their everyday world. It is the study of essences, that is, the grasp of the very nature of something. Essence makes a thing what it is; without it, the thing would not be what it is. The phenomenological approach is most appropriate when little is known about a phenomenon or when a fresh look at a phenomenon is indicated.

Cheryl Tatano Beck

PHILOSOPHY OF NURSING

Generically defined, philosophy is love of wisdom. Specifically, philosophy is a disciplined method of inquiry involving critical examination and comprehensive study of the universe—its reality (metaphysics), its knowledge (epistemology), its morality (ethics), its history (history of philosophy), and its method of argumentation (logic). Audi (2006) offers the following definitions. Metaphysics is the study of the ultimate nature of reality and of being. Epistemology is the study of the scope and nature of knowledge and of the justification of knowledge claims. Ethics is the study of the moral life. History of philosophy is the study of major philosophers and of major movements in philosophy. Logic is the study of sound principles and methods of reasoning in determining valid arguments from invalid ones.

Philosophy's method of inquiry is called *philosophical inquiry*; it involves subjecting philosophical perspectives to critical examination to determine their soundness through appeals to reason (Iannone, 2001). These appeals typically include (a) critical analysis, reflection, and interpretation; (b) conceptual, linguistic, and ethical analysis; (c) logical and dialectical argumentation; and (d) historical analysis. Although philosophy has its own body of knowledge and distinctive method of inquiry, it relates to other disciplines through subfields such as philosophy of science, philosophy of art, and philosophy of medicine. Philosophy of nursing is another subfield.

Before defining philosophy of nursing, the following questions need addressing: What is the history of philosophy of nursing? Why is it important? What are its major issues?

Philosophy of nursing has existed since Florence Nightingale (1859/1946) identified the nature of nursing in *Notes on Nursing: What It Is, and What It Is Not.* Since then, substantive nursing philosophical research has been conducted; conferences and institutes have been held; and books and journals on philosophy of nursing have been published. An example is *Nursing Philosophy*, which was first published in July 2000. Between 2000 and October 2009, 205 original articles were published in this journal by 225 different authors (Sellman, 2009). These articles focused on all major aspects of nursing philosophy: nursing metaphysics, nursing epistemology, nursing ethics, history of nursing philosophy, and nursing methods of philosophical inquiry. These articles, along with past and current scholarship on nursing philosophy, comprise the core and expanding knowledge base of philosophy of nursing. This knowledge base has helped nurses to identify central philosophical concerns of nursing, the nature of and boundaries for nursing, and the values and beliefs of nurses. Yet, major issues remain. Examples of these issues include the following: (a) How does one determine *the good* in quality of life when *the good* is defined differently? (b) How does one resolve competing stances on the nature of being and of doing in nursing practice? (c) How does one identify the moral aims of nursing in a pluralistic society?

Philosophy of nursing is a disciplined method of inquiry involving critical examination and comprehensive study of the human health nursing experience—its reality (nursing metaphysics), its knowledge (nursing epistemology), its morality (nursing ethics), its history (history of nursing philosophy), and its ways of reasoning and of knowing. Nursing's disciplined method of inquiry is called *nursing philosophical inquiry*; it involves subjecting nursing philosophical perspectives to critical examination to determine their soundness through appeals to reason and through appeals to ways of knowing. These appeals typically include (a) critical analysis, reflection, and interpretation; (b) conceptual, linguistic, and ethical analysis; (c) nursing historical analysis; (d) nursing process analysis; (e) personal processes of knowing; (f) artistic processes of knowing; and (g) intuitive processes of knowing.

Philosophy is the basis of science and of research and directs the methods within them. The qualitative research method of nursing philosophical inquiry is similar to other qualitative research methods: Literature is broadly examined; conceptual meanings are explored; questions are raised; answers are suggested; and ramifications of answers are discussed. The questions raised guide the inquiry, and data collection and analysis occur together. Data analysis focuses on words and is often collaborative and cyclical (i.e., answers generate questions, questions generate analysis, analysis generates questions). Thus, the ultimate investigative method in nursing philosophical inquiry is the critically engaged and reflective mind; it searches for nursing philosophical insights through reasoning and through ways of knowing. The expression of this critically engaged and reflective mind is the written word.

In addition to the preceding philosophical inquiry research method, Burns and Grove (2009, chap. 4) also identify three categories of philosophical inquiry research. These categories, with their primary methods of inquiry, include the following:

1. Foundational inquiry. This category of philosophical inquiry research focuses on analysis of the philosophical bases, structure, and values of a science; its primary methods of inquiry are exploration and logical analysis. Two examples of foundational philosophical inquiry research include Mackey's (2009) *Towards an Ontological Theory of Wellness: A Discussion of Conceptual Foundations and Implications for Nursing* and Green's (2009) *A Comprehensive Theory of the Human Person from Philosophy and Nursing.*
2. Philosophical analysis inquiry. This category of philosophical inquiry research focuses on examination of meaning and on building theories of meaning; its primary methods of inquiry are linguistic analysis and concept analysis. Two examples of philosophical analysis inquiry research include Hage and Lorensen's (2005) *A Philosophical Analysis of the Concept Empowerment: The Fundament of an Education-Programme to the Frail Elderly* and Harper's (2006) *Ethical Multiculturalism: An Evolutionary Concept Analysis.*

3. Ethical inquiry. This category of philosophical inquiry research focuses on an analysis of the moral life and on an analysis of ethical problems; its primary methods of inquiry are critique and debate based on ethical theories, principles, and virtue ethics. Two examples of ethical inquiry research include Begley's (2008) *Guilty but Good: Defending Voluntary Active Euthanasia from a Virtue Perspective* and Holland's (2010) *Scepticism about the Virtue Ethics Approach to Nursing Ethics.*

In sum, foundational inquiry, philosophical analysis inquiry, and ethical inquiry, when focused on nursing philosophical phenomena, constitute the three categories of nursing philosophical inquiry research in qualitative nursing research. Philosophical nursing knowledge is often derived from the research method of nursing philosophical inquiry. Future directions for nursing philosophical inquiry and for philosophy of nursing include (a) increased commitment by nurses to conduct nursing philosophical inquiry research, (b) clarification of the multiple processes of inquiry that constitute philosophical inquiry in nursing, (c) analysis and synthesis of the existing literature on nursing philosophical inquiry and on philosophy of nursing with the goal of building a cohesive body of philosophy of nursing knowledge, and (d) application of the outcomes of nursing philosophical inquiry to nursing practice.

Mary Cipriano Silva

PHYSICAL RESTRAINTS

A physical restraint is any device or object attached to or adjacent to a person's body that cannot be removed easily and restricts freedom of movement. Bilateral full-length side rails, some types of furniture, and audible alarm systems are also considered restraints when used to limit movement. Although this entry focuses mainly on physical restraints, it is important to keep in mind that these devices are often used in conjunction with psychopharmacological drugs. When given for the purposes of discipline or convenience and not required to treat specific medical or psychiatric conditions, such drugs are considered chemical restraints.

The prevalence of physical restraints in nonpsychiatric settings, estimated in 1989 to affect 500,000 elderly persons daily in hospitals and nursing homes (Evans & Strumpf, 1989), led many to conclude that a restraint crisis existed. High prevalence in the United States sharply contrasted with reported lesser use in Western Europe. The historical antecedents for these differences appeared related to American beliefs that were embedded by the end of the nineteenth century: that restraint use was therapeutically sound, necessary to control troublesome behavior, and protective against tragic accidents and injuries.

For nearly 100 years, those beliefs were largely unchallenged; debate concerning the efficacy of physical restraint was limited, and interventions for preventing and responding to "unsafe" or "troublesome" behaviors were rarely considered. Over a 20-year period, the efforts of advocacy groups and committed clinicians, changes in nursing home regulations and standards for accreditation of hospitals, warnings from the Food and Drug Administration, media exposés, and research demonstrating successful restraint reduction have forced a complete reexamination of their use (Castle & Mor, 1998; Evans & Strumpf, 2010). Although average prevalence has now declined in U.S. nursing homes to approximately 3% and acute-care medical units are often restraint free, restraint use and the problems associated with it remain a global concern. Witness the upsurge since 2000 of published research on prevalence, perceptions, and outcomes of restraint, originating primarily from Europe, Asia, the Middle East, and Australia, which reflect U.S. studies from the early 1990s.

Physical restraints are applied in hospitals and nursing homes primarily for three reasons: fall risk, treatment interference, and behavioral symptoms. To date, no scientific basis of support demonstrates the efficacy of restraints in safeguarding patients from injury, protecting treatment devices, or alleviating behavioral symptoms such as "wandering," agitation, or aggression. Several studies, in fact, suggest relationships between physical restraints and falls, serious injuries, increased behavioral symptoms, or worsened cognitive function (Capezuti, Strumpf, Evans, Grisso, & Maislin, 1998; Castle & Engberg, 2009).

Nevertheless, health care professionals and other caregivers perceive few alternatives to restraint use in some situations, especially in critical care (Minnick, Mion, Johnson, Catrambone & Leipzig, 2007). Misplaced fears about legal liability, lack of interdisciplinary discussions about decisions to restrain, and staff perceptions about patients' behavior also influence restraint practices. Insufficient staffing levels and outdated models of care assignments have long been regarded as obstacles to minimal use of physical restraints. Hospital studies offer indirect support for this conclusion by demonstrating that night shifts and weekend day shifts are the most frequent times when restraints are used (Bourbonniere, Strumpf, Evans, & Maislin, 2003; Whitman, Davidson, Sereika, & Rudy, 2001). Prevalence studies that demonstrate wide variation in restraint use across facilities in one system strongly suggest that organizational culture and norms play an important role (Meyer, Kopke, Haastert, & Mühlhauser, 2008). Several reports of restraint reduction in nursing homes and two clinical trials show that prevalence of physical restraints can be significantly reduced without increasing serious injuries or hiring more staff (Evans et al., 1997; Pellfolk, Gustafson, Bucht, & Karlsson, 2010). Data show that caring for nursing home residents without restraints is less costly than caring for those who are restrained (Phillips, Hawes, & Fries, 1993).

Too often, hospitals and nursing homes lack personnel with specialized expertise in aging or with the requisite skills for assessing and treating clinical problems specific to older adults. Studies provide promising evidence that a model of care using advanced practice nurses specializing in geriatrics can reduce restraint use in nursing homes and hospitals through staff education and consultation (Evans et al., 1997; Sullivan-Marx, Strumpf, Evans, Capezuti, & Maislin, 2003).

Continued use of physical restraints is paradoxical in view of mounting knowledge about their considerable ability to do harm. Physical restraints are known to reduce functional capacity and exert physical and psychological effects (Castle & Engberg, 2009; Evans & Strumpf, 1989; Saarnio & Isola, 2009). Furthermore, restraint use can lead to accidental death by asphyxiation (Miles & Irvine, 1992). Persons who are likely to be restrained are usually those of advanced age who are physically and cognitively frail, prone to injury and confusion, and experiencing invasive treatments. The evidence is compelling that prolonged physical restraint further contributes to frailty, dysfunction, and poor quality of life.

Restraint-free care can be accomplished through implementing a range of alternative approaches to assessment, prevention, and responding to the behaviors routinely leading to restraint. For such approaches to take hold, however, changes in fundamental philosophy, culture, and attitudes within institutions and among caregivers must occur. In settings where restraints have been reduced, there is strong emphasis on individualized, person-centered care; normal risk taking; rehabilitation and choice; interprofessional team practice; environmental features that support independent, safe functioning; involvement of family and community; and administrative and caregiver sanction and support for change. The presence of professional expertise, particularly expert nurses and physicians with education and skill in geriatrics, is crucial for sustained cultural change.

Although legislation and other forms of external regulation or control do not in and of themselves change beliefs or entirely alter entrenched practice, the Nursing Home Reform Act, part of the Omnibus Budget Reconciliation Act of 1987 (enacted in 1990), helped to raise standards in nursing homes (Castle & Mor, 1998). The Food and Drug Administration, in response to the known risks of physical restraints and reports of restraint-related deaths, mandates that all devices carry a warning label concerning potential hazards.

Following a decade of emphasis on restraint reduction/elimination in nursing homes, clinicians, researchers, and regulators began to focus attention on these practices in acute-care settings. As with nursing homes, the Joint Commission on Accreditation of Healthcare Organizations and the Centers for Medicare and Medicaid Services define restraint use as both physical and chemical. Standards mandate that restraints be used only to improve well-being in cases where less restrictive measures have failed to protect the patient or others from harm. In addition, continual individualized assessment and reevaluation of the patient by clinicians and consultation with the patient's own provider must occur with restraint use. Direct care staff must also be trained in proper and safe use of restraining devices.

Current approaches to restraint reduction vary along a continuum from promotion of restraint-free care to an attitude of tolerance for restraint use under certain circumstances. Successful reduction of physical and chemical restraints in nursing homes suggests the feasibility of achieving the same changes in hospitals, where a disproportionately high incidence of iatrogenesis occurs, much of it exacerbated by immobilization from the use of physical restraints and adverse reactions to psychoactive drugs. The resulting complications—especially delirium, pressure ulcers, infections, and fall-related serious injuries—add dramatically to the cost of care, increased lengths of stay, and further loss of function.

Although professional organizations in nursing and medicine have endorsed non-use of physical restraints and appropriate use of psychoactive drugs as the standard of care in all health care settings, the debate surrounding physical restraint use in hospitals continues unabated (Jones et al., 2007). Clinicians caring for specialty populations, such as those found in critical care, trauma, and neurology, are urged to identify, test, implement, and disseminate evidence-based interventions that reduce reliance on physical restraints. A standard of least restrictive care challenges professionals to use comprehensive assessment to make sense of individual behavioral symptoms and to employ a range of interventions that enhance physical, psychological, and social function, as well as to acknowledge, affirm, and protect the uniqueness and dignity of each older person under their care.

Lois K. Evans
Meg Bourbonniere
Neville E. Strumpf

PHYSIOLOGY

Physiology is the study of the function of living organisms. Human physiology encompasses function at the molecular, cellular, tissue, organ, and system levels. Physiological investigations usually seek to explain how the human body maintains or restores homeostasis. As principle and coinvestigators, nurses are engaged in physiological research to discover biological processes that support and restore function across the life span.

Physiological research is linked to the metaparadigm of nursing through the concepts of person and health (Meleis, 2007). Although some might argue that a physiological approach to understanding human health is reductionist, physiology provides important understanding about components, pathways, and processes of homeostasis, building knowledge about the relationships between health and human experiences. Humans use physiological mechanisms to maintain and restore health. Holism implies that all aspects of human experience—physiological, psychosocial, spiritual, behavioral, and environmental—are valuable and interactive.

Nurses commonly deal with the physiological needs of patients and this aspect of nursing care is accepted by society (Meleis, 2007). A physiological perspective is connected directly and consistently with nursing education and practice (Ignatavicius & Workman, 2009; McCance, Huether, Brashers, & Rote, 2010). Since its establishment as a unique institute at the National Institutes of Health, the National Institute of Nursing Research has championed physiological research under initiatives to explore and build biobehavioral knowledge for practice (Rudy & Grady, 2005). Further, articles about physiological research are used by nurses as well as other disciplines (Burns, Yucha, & Wiss, 2004). Knowledge from investigations into physiological phenomena is valued by agencies that fund nursing research, professional nursing societies, and the individuals that receive nursing care. The preparation and support of nurses who engage in physiological inquiry continues to be somewhat controversial as does the acceptance of researchers who engage in laboratory and basic science that is not directly linked to nursing practice.

Understanding the physiology of health and disease has the potential to affect the economics of health care, particularly in managing complications from acute illness and preventing or slowing progression of dysfunction from chronic illness. Aggregated physiological data can be useful in identifying groups who may respond to specific interventions. To illustrate, many nurse researchers have contributed to management of hypertension and diabetes. Preventing and managing complications from these two common, chronic, and potentially debilitating conditions has the potential to significantly impact the economics of health care.

The explosion of information about molecular influences in physiology since completion of the genome project has provided new insights into homeostasis at the microscopic level. Nurses need to access and use this information in education, research, and practice (www.nursingworld.org/MainMenuCategories/EthicsStandards/Genetics_1/EssentialNursingCompetenciesandCurriculaGuidelinesforGeneticsandGenomics.aspx; Competencies and Curricula Guidelines Established by Consesnsus Panel, 2009). To illustrate, tests to identify infecting organisms using polymerase chain reactions or protein-based assays provide results in less than 24 hours compared with 48 to 72 hours for traditional microbiology culture techniques. Appreciating the biological science that developed these diagnostic strategies contributes to effective test selection and interpretation by bedside and advanced practice nurses.

Physiologic nursing research embraces multi- and interdisciplinary research. Research in a collaborative research team environment is recognized as beneficial across a variety of disciplines (Kher, 2010). Identifying and testing biomarkers for rapid diagnosis and evaluation of interventions appears to be a trend among funding organizations. Early diagnosis and targeted, effective interventions that cross disciplines can mitigate suffering, prevent complications and save lives. Physiological homeostasis is complex and the incorporation of many perspectives in health care has the greatest potential to develop comprehensive care.

Incorporated into a wide range of both grand and middle range theories, physiological investigations build understanding about human responses to health and disease. Some models of nursing that explicitly use physiological concepts in the theoretical framework include the Neuman Health Systems Model (e.g., bodily structure and internal function are assessed and supported; Neuman & Fawcett, 2002, pp. 16 and 17); the Human Response to Illness Model (e.g., the interaction of physiological processes with psychosocial factors; Mitchell, Gallucci, & Fought, 1991); The Roy Adaptation Model (e.g., physiological regulator systems are used to promote adaptation; Meleis, 2007, p. 293), the Orem Self-Care (e.g., meeting biologic needs is a goal of nursing care; Edwards, 2000), and Johnson's Behavioral Systems (e.g., nursing intervenes to reduce stress to the ingestive, eliminative, and sexual subsystems for recovery/goal achievement; Meleis, 2007, pp. 280 and 281). Midlevel theories that incorporate physiology into nursing research and practice include acute pain management (Good, 1998) and biobehavioral approaches to stress management (Kang, Rice, Park, Turner-Henson, & Downs, 2010).

Physiologic research in nursing embraces basic, clinical, and translational science. For example, nurse researchers are using an animal model to investigate chronobiolological contributions to chronic critical illness (Hanneman, McKay, Costas, & Rosenstrauch, 2005; McCarley, Hanneman, Padhye, & Smolensky, 2007). Other nurse researchers use basic research techniques to determine genetic and proteomic associations with transplant rejections (Cashion et al., 2010; Driscoll et al., 2006), tobacco cessation (Ahijevych, 2009; Ashford et al., 2010), and psychoimmunology, stress, and inflammation relationships (Thompson & Voss, 2009; Winkelman, 2010). Technology and funding trends support the use of biomarkers in national research initiatives (www.researchamerica.org/uploads/healthdollar08.pdf; Frazier, Sparks, Sanner, & Henderson, 2008). The use of biomarkers will likely expand with the development of biobanks or other large repositories of genetic material (Williams, Schepp, McGrathe, & Mitchell, 2010).

Leaders in clinical research have investigated physiology related to cardiac monitoring (Drew et al., 2010), neonatal development (Brown, 2009; Lyon et al., 2010), gender (Heitkemper, Landis, & Woods, 2010), mood (Woods & Mitchell, 2005), and caregiving (Berg & Woods, 2009; Douglas, Daly, Kelley, O'Toole, & Montenegro, 2005). These topics have helped develop insight into homeostasis across the life span and the interaction between physiology and human experiences in health and disease. Clinical research is also linking physiology with patient safety, such as identifying vital signs or heart rate variability with patient risk for adverse events and applying lessons learned to nursing education (Rathbun & Ruth-Sahd, 2009).

Exemplars of translational physiological research are investigations into the identification and management of chronic, debilitating disease. Nurses have been leaders and collaborators in funding projects related to acute and chronic pain. Other exemplars of translational research are illustrated with investigations using physiological factors to prevent pressure ulcers, to promote urinary continence, and to manage fatigue. A large body of nursing research has contributed to the assessment of pain in nonverbal patients and evaluated of the effects of nonpharmacological management of acute and chronic pain (Page, Fennelly, Littleton-Kearney, & Ben-Eliyahu, 2008; National Institute of Nursing Research, 2010).

Physiology is incorporated into nursing research, education, and practice. Emerging trends in physiological nursing research include the use of molecular biomarkers and cellular models. Genomic science holds great promise for identifying restoration of health. The complexity and interactive processes of physiology are ideally suited to multidisciplinary research teams. Biobanks will provide new and unique opportunities for physiological nursing research. Physiologic research continues to build nursing science and, ultimately, improve nursing care.

Chris Winkelman

PILOT STUDY

A pilot study is a smaller version of a proposed or planned study that is conducted to refine the methodology for a larger study. A pilot study uses subjects, settings, and methods of data collection and data analysis similar to those of a larger study.

It is recommended that all large-scale studies have either pilot work or other preliminary work as evidence of feasibility of the project and to demonstrate the competence of the investigator with the area of study. Feasibility issues that might be addressed in a pilot study include the availability of subjects and estimating the time required for recruitment of subjects, the conduct of the investigation, and the cost of the study. Particularly when planning studies with populations that may not be easily available or accessible, a pilot study is an opportunity to develop or refine sampling methods and to evaluate the representativeness of a sample.

Preliminary work in the form of a pilot study provides an opportunity to identify problems with many aspects of study design. One important design issue that can be evaluated during the pilot work is determining the number of data collection points and the optimal time between phases of data collection. Pilot work can be used to develop, to test, or to refine a study protocol, including the treatment or intervention to be used in an experimental or quasi-experimental study. Sufficient pilot work is necessary to support the efficacy of an intervention prior to proposal submission for a large-scale intervention study. During a pilot study, extraneous variables that had not been considered in the design may become apparent, and methods to control for them can be introduced when the larger study is designed.

Pilot work also allows the development or refinement of data collection instruments, including questionnaires and equipment. The performance of instruments with a particular sample under specific conditions also can be evaluated in the pilot project. When collecting quantitative data, the reliability and validity of instruments and the ease of operation and administration can be evaluated prior to data collection in a large-scale study. This is an important step whether the data collection instruments are interview schedules, questionnaires, computers databases, or equipment to gather biophysical data. For example, during pilot work, questionnaires can be evaluated for clarity of instructions, wording of questions, reading level, and time required for completion. For qualitative studies, pilot work may be important for gaining experience in interacting with the sample and with aspects of data collection, coding, and analysis.

The results of a pilot study are likely to be significant for the larger proposed study. If the pilot study is of sufficient size, estimates about the relationships between variables and of effect sizes can be made. This is essential not only for statistical power analysis but for a better understanding of the phenomena under study. Pilot studies often provide important insights into the problem being investigated and may lead to reconceptualization of the problem or refinement of the research questions.

Carol M. Musil

POPULATION HEALTH

The term population health is fairly new. Although the current emphasis on improving health outcomes, eliminating health disparities, and reducing health care costs amplifies the importance of population health, a single accepted definition has yet to emerge. Furthermore, the debate about whether population health refers to a "concept of health" or "the study of determinants of health" is unresolved (Hartley, 2004; Kindig, 2007; Kindig & Stoddart, 2003; Mechanic, 2007; Raphael & Bryant, 2002). Nevertheless, the origin of the concept of population health can be traced back to a historic eighteenth-century debate over the relationship between economic growth and human health (Szreter, 2003). Expectedly, across the years, the health of populations has been inextrinsically linked to concepts of both epidemiology and economics.

In an article titled "Producing Health, Consuming Health Care," Evans and Stoddart (1990) merged concepts and principles from economics and epidemiology to support that health is determined by multiple factors. In a book titled *Purchasing Population Health: Paying for Results*, Kindig (1997) defined population health as "the aggregate health outcome of health adjusted life expectancy (quantity and quality) of a group of individuals, in an economic framework that balances the relative marginal returns from multiple determinants of health" (p. 47). Kindig's definition proposed a unit of measure for population health and underscored a relationship between economics and health. In an article titled "What Is Population Health?" Kindig and Stoddart (2003) attempted to distinguish population health from public health, health promotion, and social epidemiology. Following a critique of existing definitions and understandings of population health dating back to the early 1990s, these authors concluded that population health is concerned with both the definition and measurement of health outcomes and the roles of determinants. Kindig and Stoddart (2003) defined population health as the health outcomes of a group, including the distribution of the outcomes within the group, and argued that the field of population health included health outcomes, patterns of determinants of health and interventions, and policies that link outcomes with determinants. In 1998, Young published a book titled *Population Health Concepts and Methods*. Now in its second edition, this textbook provides a comprehensive overview of factors that influence health along with the identification of basic methods for assessing population health. Young (2004) defined population health as a "conceptual framework for thinking about why some people are healthier than others and the policy development, research agenda, and resource allocation that flow from this" (p. 4). Young (2004) lays out a trajectory for population health studies based on description, explanation, prediction, and control. Specifically, Young (2004) supports that the state of the health of a population should be first described to identify prevalent health problems. Once problems are identified, explanations should be sought in relation to "why the state of health is what it is" and "why certain problems occur" (p. 6). Then, according to Young, results of studies of disease patterns and their determinants should be used to predict health effects and strategies for risk avoidance. In the end, knowledge from these population health studies can be translated into health policy to prevent disease and promote health.

In the study of determinants of population health, population is defined demographically, politically, and/or geographically. Health is most often defined as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (World Health Organization, 1948, p. 100), and determinants are defined as factors (events, characteristics) that affect health (Department of Health and Human Services, 2000; Evans & Stoddart, 1990; Kindig, 2007). "A clear conceptual framework for the selection and use of indicators may help point to the dimensions of population health of import, and lead to more balanced discussions about what indicators should be targeted . . . to impact population health" (Etches, Frank, Di Ruggiero, & Manuel, 2006, p. 44). Ideal indicators are as follows: built on consensus, based on a conceptual framework, valid, sensitive, specific, feasible, reliable, sustainable, understandable, timely, comparable, and flexible (Etches et al., 2006).

Evans and Stoddart (1990) proposed a framework for the study of determinants of population health, incorporating this premise of ideal indicators and depicting the complex casual relationships between health and function, disease, well-being, health care, individual behavior and biology, social environment, physical environment, and genetic environment. Purposed to promote understanding of the determinants of population health and the discussion and formulation of policy, the Evans and Stoddart framework has been foundational to shaping national health goals. In the United States, *Healthy People 2010* outlines a systematic approach for improving the health of the nation based on two broad goals, increasing the quality and years of healthy life, and eliminating health disparities (Department of Health and Human Services, 2000). Incorporating both ideal indicators and determinants of health into a plan for population health improvement, *Healthy People 2010* underscores the necessity of monitoring and evaluating determinants (biology, behavior, social and physical environment, policies and interventions, and access to quality care) in understanding a population's health status. Leading health indicators are identified to facilitate understanding of the importance of health promotion and disease prevention and encourage participation in developing strategies to improve population health. Built on consensus and rooted in an operational framework, these leading health indicators are identified as (1) physical activity, (2) overweight and obesity, (3) tobacco use, (4) substance use, (5) responsible sexual behavior, (6) mental health, (7) injury and violence, (8) environmental quality, (9) immunization, and (10) access to care.

In Canada, the document titled "The Population Health Template: Key Elements and Actions that Define a Population Health Approach" consolidates current understandings of population health and outlines procedures and processes for implementing a population health approach. In the Health Canada (2001) template, population health is defined as "the health of a population as measured by health status indicators and as influenced by social, economic, and physical environments, personal health practices, individual capacity and coping skills, human biology, early childhood development, and health services" (p. 2). Addressing the notion that population health is both a concept of health and the study of determinants of health, the population health template is a framework in which eight key elements of a population health approach are identified: (1) focusing on the health of populations, (2) addressing the determinants of health and their interactions, (3) basing decisions on evidence, (4) increasing upstream investments, (5) applying multiple strategies, (6) collaborating across sectors and levels, (7) using mechanisms for public involvement, and (8) demonstrating accountability for health outcomes (Health Canada, 2001).

Population health is focused on improving the health status of populations, enhancing health care quality and access, and decreasing costs. A population health approach targets entire populations; intervenes with families, communities, systems, and individuals; recognizes and emphasizes multiple determinants of health; incorporates primary, secondary, and tertiary prevention; and includes ongoing assessment, monitoring, and improvement. Population health research can be used to describe, to explain, to predict, and to control. Keys for effective study of the determinants of health include a conceptual framework and health indicators that are valid, sensitive, specific, feasible, reliable, sustainable, understandable, timely, comparable, and flexible. These keys are essential to accomplishing the ultimate goal of population health research, which is to translate knowledge gained from the results of population health studies into policy that can be used to prevent disease and promote health.

Sandra C. Garmon Bibb

POPULATIONS AND AGGREGATES

The term *population* has come into the language of nursing by way of public health specialists and statisticians. It has importance because of its meaning to both researchers and practitioners. In a very broad sense, the term *population* refers to a collection of entities that have one or more characteristics in common. The characteristic may be defined in many ways, in terms of place, time, or a personal characteristic. According to Kendall and Buckland (1960), "in statistical usage the term 'population' is applied to any infinite collection of individuals. It has displaced the older term 'universe'…it is practically synonymous with 'aggregate' and does not necessarily refer to a collection of living organisms" (p. 223). The conception of a population is basic to an understanding of inductive or inferential statistics. Stated succinctly by Blalock (1960), "the purpose of statistical generalizations is to say something about various characteristics of the populations studied on the basis of known facts about a sample drawn from that population or universe" (p. 89). In statistics, population characteristics are called parameters and are denoted by Greek letters, and sample characteristics, called statistics, are denoted by Roman letters. According to Blalock, in inductive statistics "it is the population, rather than any particular sample, in which we are really interested." As a matter of convenience, a sample is selected but the goal is "practically always to make inferences about various population parameters on the basis of known, but intrinsically unimportant sample statistics" (p. 90). The underlying foundation for making inferences from samples to the population is the mathematical theory of probability.

Within the health field, particularly in public health and the disciplines of epidemiology and biostatistics, and the nursing specialization of public health nursing, the term *population* usually refers to biological entities such as people, animals, or microorganisms that hold characteristics in common. Population has a very prominent position in epidemiology. In discussing the classical understanding of epidemiology, J. N. Morris (1964) referred to it as "the study of the health and disease of populations" (p. 4). More recently, Mausner and Kramer (1985) defined epidemiology as "the study of the distribution and determinants of diseases and injuries in human populations" (p. 1).

Historically, public health specialists such as health officers focused on populations and subpopulations as the target for planning, service programming, and evaluation efforts. Although public health nurses provided clinical services in public health programs directed to target populations such as children younger than 6 years or prenatal clients, their predominant focus was clinical, at the level of the patient or the family. The idea of taking a population approach to the practice of public health nursing began to appear in public health nursing discussions and literature in the 1970s. In a 1977 paper, Williams pointed out the conceptual and sematic muddle that surrounded what was then referred to as either community health nursing or public health nursing, terms which were used interchangeably. Williams suggested that community and public health nursing were defined primarily in terms of where care was provided and that the majority of the efforts of nurses who were identified as public health nurses or community health nurses were actually individualistic in focus, directed to specific individuals or families. Williams recommended that to increase effectiveness, public health nurses needed to adopt a population perspective in defining problems and merge the population focus with their understanding of the needs of individuals and families in proposing and implementing interventions (Williams, 1977).

In discussing what population-focused nursing meant, Williams (1977) introduced the term *aggregate* to the public health nursing literature to broaden the idea of a population to denote groups of people who had one or more characteristic in common but might not be part of a defined *community*, geographically or sociologically. In other words, it was meant to expand the idea of a population to be more flexible in grouping individuals to see patterns that would be missed if one looked only at the individual and not a meaningful groupings (aggregates) of individuals. Williams also reflected on the importance of preparing nurses with other areas of specialization in aggregate-level skills and in developing practice models, which clearly demonstrate effective integration of clinical approaches and strategies for dealing with aggregate-level data.

What happened to the term *aggregate*? Although it is still used by some, particularly in the international health literature (see Mackenbach, Bouvier-Colle, & Jougla, 1990), the term *population* has emerged as the term most frequently used in the United States.

The conceptual shift from a focus on individual patients, the thrust in the clinical preparation of nurses, to a focus on populations, which is the concern of public health, can be difficult. The basic idea in population-focused practice, the essence of public health practice, is that problems are defined at the population level using a variety of assessment strategies and solutions (interventions) such as policy development and/or the implementation of particular services or programs for a defined population or subpopulation as opposed to diagnoses or interventions at the level of the individual client or patient (Williams, 1996, 2005). Since the 1970s, public health nursing has incorporated a strong population perspective as evidenced by the Scope and Standards of Public Health Nursing published by the American Nurses Association (2007) and supported by public health specialty organizations.

Numerous changes have taken place in health care in the last 30 years, particularly in financing and in the science underlying practice. One of the most significant drivers of change has been what Starr (1982) described as the industrialization of health care, the massive introduction of private capital to finance health care provider organizations, and the development of various technologies used in health care. Other drivers have been of federal-level decision about the use of the public dollar in paying for health care for those with Medicare and Medicaid coverage and decisions by health insurance companies, which led to the adoption and spread of various prospective payment schemes. Such schemes have brought the *population* perspective front and center in health care decision making. This is so because so many decisions are made using aggregate or population-level data. Such decisions include the following: what services will be provided to whom, for what types of problem, in what setting (e.g., in hospital, home, primary care office), by whom (which provider groups), and who will pay (private payers, government payers, self-pay). From a purely economic perspective, a population perspective is essential. However, there is a more important reason for nurses and other professionals to adopt a population perspective and become proficient in it. A population perspective is essential for research utilization, and it is important in the pathway to improving health care and patient/client outcomes.

Today there is much attention to evidence-based decision making in care delivery and in the preparation of health professionals. Taking an evidence-based approach to decision making in nursing entails being able to integrate information from the literature (body of knowledge) and apply it to problems in practice. Researchers study samples of populations with specific characteristics. The extent to which a finding in a sample from a particular population can be predicted in another can be assessed primarily by determining the comparability between the populations. If the individuals in a clinical or community-based program were identified as a population or subpopulation, with key characteristics in common, rather than unique individuals, the program population could be compared with another studied population. For example, nurses working with older adults hospitalized with heart failure can obtain data on their population and compare their population to the sample which Naylor et al. (2004) studied in their randomized controlled trial of transitional care for heart failure patients. If they determine that the two populations are similar in important ways, they are in a good position to infer that the intervention used by Naylor et al. might work for their population. However, if the intervention is implemented, it would be important to monitor what happens in their population.

Although a population-focused approach has traditionally been central to public health practice, it is not recognized by many that a population perspective is essential to decision making in all areas of health care practice and at various levels of analysis, microsystem, mesosystem, and macrosystem. The importance of a population perspective for those who wish to assume leadership roles in nursing and health care led the faculty at the University of Kentucky to emphasize a population perspective in their doctor of nursing practice (DNP) program and make it one of the four foundational concepts of the DNP curriculum. The other three were research utilization/evidence-based decision making, processes of change in organizational settings, and leadership (Williams, Stanhope, & Sebastian, 2001; Chism, 2010). As the national dialogue about a practice doctoral degree for nursing unfolded in 2004 and the essential content for DNP programs was identified, it is clear that the nursing community saw the benefit of a population perspective and embedded it in the Essentials of Doctoral Education for Advanced Nursing Practice (American Association of Colleges of Nursing, 2006), a document guiding the development of curricula for DNP programs nationwide and the accreditation of DNP program by the Council of Collegiate Nursing Education.

Carolyn A. Williams

POSTPARTUM DEPRESSION

Postpartum depression (PPD) is an important public health problem because of its prevalence worldwide and substantial associated risks. PPD is believed to affect more than 14% of women following delivery according to the U.S. Agency of Health Care Research and Quality (Gaynes et al., 2005). However, when self-report depression measures are used to identify women with milder symptom levels, including women from countries other than the United States, higher percentages have been reported. According to the *Diagnostic* *and Statistical Manual of Mental Disorders*, fourth edition, text revision (American Psychiatric Association, 2000), diagnostic criteria specify onset within 4 weeks postpartum. The most frequent symptoms are feelings of inadequacy, sadness, fatigue, anxiety, worry, compulsive thoughts, and diminished functioning that can occur from within 2 weeks postpartum to beyond 1 year. Women experiencing PPD can experience symptoms severe enough to require a combination of pharmacological interventions and either short- or long-term counseling and therapy and even hospitalization. Concerns about the risks of medication used to treat PPD have included the effects on breast milk and the developing infant, although a recent systematic review of relevant studies to date has indicated that this problem is dependent on the type of drug used (DiScalea & Wisner, 2009).

PPD is distinguished from commonly experienced "postpartum or maternity blues" and postpartum psychosis. Postpartum blues is characterized by onset during the first 2 weeks after delivery, presence of mild depressed symptoms with typically rapid resolution, and prevalence as high as 80% in the United States. In addition, postpartum blues wane without need for intervention. Postpartum psychosis, in contrast, is a rare (1–2 per 1,000) and severe disorder. Symptoms may emerge as early as 1 month before delivery, and rapid postpartum onset within 4 weeks postpartum is characteristic. Hallucinations, delusions, and paranoia are hallmarks and can be associated with suicidal and homicidal ideation. Therefore, risk of harm to the infant is a major concern with psychosis and with severe PPD when cognitive distortions are present (American Psychiatric Association, 2000).

During the last two decades, a major shift in research has occurred from an emphasis on treatment of PPD by psychiatrists and psychologists, to a multidisciplinary approach, to research and treatments. Researchers have aimed specifically at determining the major risk factors associated with the development of PPD. A range of risk factors have been identified with the development of PPD, including a history of depression, difficult infant temperament, marital or partner relationship problems, child care stress, low self-esteem, and poor social support. Depressive symptoms in mothers of prematurely born infants were associated with the stress of their infants' hospitalizations and maternal role issues in postpartum (Miles, Holditch-Davis, Schwartz, & Scher, 2007). Results from a national U.S. survey of 1,359 women conducted in 2002 ("Listening to Mothers") showed that younger women with less education had the highest rates of moderate–severe depression symptoms as measured by the Edinburgh Postnatal Depression Scale (EPDS; Mayberry, Horowitz, & Declercq, 2007). Results from a recent large-scale PPD screening initiative of more than 5,000 women showed that race/ethnicity identification other than Caucasian and having less than a high school education were associated with higher PPD scores (Horowitz, Murphy, Gregory, & Wojcik, 2009). Results from these two recent studies with large samples suggest that previous mixed results concerning demographic risk factors may have due to small samples and limited diversity among samples. Thus, race/ethnicity identification other than Caucasian, very young age, and low education may in fact increase the PPD risk.

The EPDS is the most widely used screening instrument in research conducted worldwide (Gaynes et al., 2005), and many single sample studies have been published by nurse researchers from countries all over the world. One example of an international multisite study involved 892 women from nine countries, which was designed to compare differences in postpartum depressive symptomatology across samples at 4 to 6 and 10 to 12 weeks postpartum (Affonso, De, Horowitz, & Mayberry, 2000). Average depression scores for women from countries in which postpartum cultural traditions are practiced were significantly higher than depression scores for women from Europe, Australia, and the United States—"Western" industrialized countries without such widespread rituals. In focus groups conducted in each of the countries, similar patterns of symptoms were described (Horowitz, Chang, Das, & Hayes, 2001). Fatigue and pain were common physical symptoms, with irritability, anxiety, loneliness, worrying, indecisiveness, and poor concentration being emotional and cognitive symptoms. Role and relationship conflicts were described within the context of cultural variations. These findings demonstrate that additional research is needed to explore postpartum cross-cultural adjustment problems and to test strategies for relieving distressing symptoms. In addition, a gap in PPD research for immigrant women in North America has been identified (Fung & Dennis, 2010).

Convincing research findings indicate that a major problem associated with PPD is disturbances in maternal–infant interactions. Intrusive or withdrawn patterns of behavior have been linked to delays in infant cognitive and emotional development (Field, 2010). Dunst and Kassow (2008) concluded that efforts to modify caregiver sensitivity to their children's behavior using behaviorally based interventions that focused on changes in caregiver contingent social responsiveness were most effective. In response to this growing evidence, nurse investigators have studied the efficacy of an interactive coaching approach delivered by a trained home visiting nurse that produced promising findings in terms of a positive effect on maternal infant responsiveness (Horowitz et al., 2001). Until PPD screening is a universal practice, identification of mothers at risk for PPD remains a major challenge to this work. Many mothers decline to participate in follow-up services (Horowitz et al., 2001, 2009). Moreover, delivery of personalized mother–infant coaching interventions is labor intensive, for example, via home visits (Horowitz et al., 2001). Testing ways to deliver personalized behaviorally targeted interventions to promote sensitive, responsive maternal–infant interaction is challenging but is supported by the current research (Horowitz et al., 2009). Thus, researchers are challenged to test additional interventions and cost-effective approaches to delivering behaviorally based maternal–infant interventions,

Nurse investigators are also involved in developing and testing alternative screening tools for early detection of depression symptoms as one step toward preventing illness severity. The Postpartum Depression Screening Scale (PDSS) (Beck & Gable, 2001) is the most promising, 35-item self-report instrument to identify women who are at high risk for PPD. However, although both the PDSS and EPDS are well-tested and available, a major hurdle has been the provision of universal depression symptom screening of women postdelivery. In the "Listening to Mothers II" U.S. national survey, only 58% of 1573 postpartum mothers interviewed by telephone or Internet, were asked by their caregiver if they had experienced feelings of depression in the weeks following childbirth (DeClercq, Sakala, Corry, & Applebaum, 2006). In a nurse researcher-led study of 674 mothers who actually screened positively for depression symptoms with the EPDS, 26% were not asked about their emotional state by clinicians (Horowitz, Murphy, Gregory, & Wojcik, 2009). Because one of the interferences with adopting screening protocols is the lack of adequate information, Best practice guidelines and Internet education programs have recently been developed for both health professionals and women (Neiman, Carter, Van Sell, & Kindred, 2010; Wisner, Logsdon, & Shanahan, 2008),

Recommendations for the conduct of future research include studies to examine: (a) short- and long-term effects of both in-person and Internet-based early PPD symptom screening procedures and programs; (b) RCT designs to test the efficacy of nonpharmacological treatments and counseling approaches for PPD in multiethnic and multilingual women including interventions to enhance the quality of mother–child interaction; (c) longitudinal studies to examine the course of maternal depression over time using various combinations of counseling and follow-up, that is, home visits, pediatric encounters, and virtual Internet settings; (d) family research to explore consequences of PPD on family health and test family-oriented interventions; and (e) cross-cultural studies and inclusion of diverse samples to document prevalence rates, discern both risk and protective factors, and test innovative culturally relevant interventions.

Linda J. Mayberry
June Andrews Horowitz

PREGNANCY

Nurse researchers continue to be active in conducting research related to pregnancy and its effects on the mother, newborn, family, and society at large. Some of the most recent "hot topics" in pregnancy research include vaginal birth after cesarean section (VBAC), elective induction of labor and cesarean section "on demand," pain management, outcomes, pregnancy after previous loss, mental health during the childbearing cycle, and effects of obesity epidemic on pregnancy weight gain, postpartum weight loss, and outcomes for mothers and infants.

Nurse researchers have investigated women's experiences with VBAC, hospital policies related to VBAC, and cost analyses of the different delivery methods. Nurses have also examined maternal and neonatal outcomes after VBAC when compared with repeat cesarean section and how to best prepare women for the experience.

Gatward, Simpson, Woodhart, and Stainton (2010) studied women's perception of having labor induced for postdate pregnancy and found two dimensions to their experience. The first was a sense that time is up and the second was a shift in expectations from the original birth plan. Women varied from welcoming the end of pregnancy to feeling that their body or baby was not ready for birth (Gatward et al., 2010). Women in this study also identified a lack of meaningful information related to the process of labor induction. Induction-related worries included concern for both the baby's and mother's health and the loss of a natural birth.

McGrath and Ray-Barruel (2009) examined mothers' experience with the decision-making process regarding subsequent birth choice when the previous birth was a cesarean section. The mothers in the study who opted for another (elective) cesarean chose it because of fear and the desire to retain some control over the birth process. Women made this decision before or very early in their pregnancy and did not present themselves as being open to considering other options.

Stark and Miller (2009) investigated barriers nurses face to using hydrotherapy for women experiencing labor pain. Nurses perceived institutional factors as significant barriers. Individual characteristics of the nurse (e.g., age, education, and role) were not found to be barriers. Nurses in the study who reported higher rates of epidural anesthesia and cesarean births at their facility also reported more barriers. The perception of institutional barriers was seen across different types of facilities that provided different levels of maternity services. Nurses reported fewer barriers in facilities where nurse midwives did the majority of deliveries.

Outcomes of pregnancy have been addressed by nurse researchers in many formats. Lefebvre et al. (2010) examined women's perceptions of an integrated model of substance abuse treatment during pregnancy. Women described feeling more comfortable with treatment teams that shared a consistent nonjudgmental attitude. Themes that emerged from these focus groups included judgment, physician patient communication, team communication, support groups, and self-responsibility (Lefebvre et al., 2010).

Nurse researchers have also addressed women's experiences during a subsequent pregnancy after a pregnancy loss. Woods-Giscombé, Lobel, and Crandell (2010) examined the impact of miscarriage and parity on patterns of maternal distress in pregnancy and found that state anxiety and pregnancy-specific distress were high during the first trimester and decreased as pregnancy progressed. However, women with a history of a prior loss tended to have higher levels of state anxiety in the second and third trimesters when compared with women who had not experienced a loss (Woods-Giscombé et al., 2010).

Depression during the childbearing cycle has received increased attention in recent years. Studies have focused on antenatal depression and postpartum depression. A recent pilot study (Jesse et al., 2010) found that an exercise intervention helped low-income women who were at risk for antenatal depression. Dennis (2010) found that peer support in the form of a volunteer who made phone calls to women during the postpartum period contributed to prevention of postpartum depression.

Beck and Watson (2010) examined the experience of pregnant women who gave birth to a second child after a traumatic first birth. Women in the study met the criteria for posttraumatic stress disorder. Women who experience a traumatic first birth tend to have fewer total children and wait a longer length of time before becoming pregnant again. Childbirth-related posttraumatic stress disorder impacted women's relationships with their partner, communication, conflict, emotions, and bonding with their infants (Beck & Watson, 2010). Four themes emerged from these interviews: riding the turbulent wave of panic during pregnancy; strategizing: attempts to reclaim their body and complete the journey to motherhood; bringing reverence to the birthing process and empowering women; and still elusive: the longed-for healing birth experience. Subsequent births after a traumatic birth are an opportunity to heal or present the potential to further traumatize women.

Obesity during pregnancy has gained increasing attention over the past decade. Groth and Kearney (2009) interviewed a diverse sample of low-income women who delivered an infant in the last year regarding their perceptions of gestational weight gain. Women in the study were concerned about weight gain during pregnancy, but most of them focused on the effects of insufficient gain on the developing fetus, without concern for the risks of excessive gain. Inaccurate information regarding appropriate gestational weight gain and the difficulty of return to prepregnancy weight was common.

Nurse researchers have also investigated weight gain behaviors during pregnancy, interventions to improve weight loss after pregnancy, and maternal eating behaviors. Obesity and its effects on pregnancy and pregnancy outcomes have also been addressed by nurse researchers. The idea that fetal genes can be influenced both positively and negatively by the in utero environment is a newer concept that is gaining momentum in nursing research, particularly in the area of maternal obesity and later affects on the offspring.

Various health-promoting behaviors during pregnancy have been examined by nurse researchers. Yeo, Cisewski, Lock, and Marron (2010) examined exercise adherence in pregnant women and found that adherence decreased as gestation increased and that "top adherers" maintained their level of adherence whereas those with lower levels of adherence decreased their participation (Yeo et al., 2010). Adherence was also influenced by exercise type and sedentary pregnant women were found to adopt exercise habits differently than other sedentary populations (Yeo et al., 2010).

Weiss, Fawcett, and Aber (2009) investigated adaptation, postpartum concerns, and learning needs in the first 2 weeks after birth of women who experienced cesarean section. Women with unplanned cesarean sections and those experiencing birth for the first time reported less favorable adaptation than women who had a scheduled (planned) cesarean birth or already had a child. Black women reported lower social adaptation and Hispanic women had more role concerns. Both Black women and Hispanic women reported more learning needs than White women.

Nurse researchers have also investigated maternal pushing during delivery. Kelly et al. (2010) reported a study of delayed pushing versus immediate pushing in the second stage of labor among nulliparous women with continuous epidural anesthesia. Women in the delayed pushing group had shorter durations of pushing, and maternal fatigue scores, perineal injury, and fetal heart rate decelerations (the secondary outcome measures) were similar for both groups. Delayed pushing resulted in a significant decrease in time spent pushing but did not increase the total time in second stage labor (Kelly et al., 2010).

On a related note, considerable amounts of nursing research efforts have been devoted to the prevention of pregnancy and unintended pregnancy. Much of the prevention work has addressed adolescent pregnancy and interventions for both primary prevention and prevention of a second pregnancy during adolescence. Noone and Young (2010) found that characteristics and behaviors of adolescent daughters and mothers were barriers and facilitators to adolescent pregnancy prevention. Over half of all pregnancies that occur in the United States are unplanned; therefore, many women experience unplanned pregnancy and need resources to cope with decision making regarding the pregnancy and how to manage the pregnancy. In addition, nurse researchers have examined outcomes for women and infants related to unplanned pregnancy.

An emerging new topic in nursing research is the concept of reproductive coercion. Reproductive coercion is when a male partner tries to force a female partner to become pregnant. Coercion can take many forms, including sabotaging contraception. Research in this area is in its infancy but is expected to increase among nurses.

In summary, nurse researchers have been instrumental in improving care to pregnant women through their dedicated research efforts.

Kristen S. Montgomery

PREVENTION OF PRETERM BIRTH, PRETERM LABOR, AND LOW BIRTH WEIGHT

Prevention of preterm birth is the major maternal–child health issue across developed countries and the leading cause of perinatal mortality and long-term morbidity in the United States (Ashton, Lawrence, Adams, & Fleishman, 2009; Institute of Medicine, 2007; Williamson et al., 2008). Despite a recent slight decrease, preterm births in the United States have increased 36% since 1984 (Macdorman & Mathews, 2009; Martin, Osterman, & Sutton, 2010). In 2007, 12.7% of U.S. births were preterm compared with 5% to 7% in most developed countries (Ashton et al., 2009; Domingues, Matijasevich, & Barros, 2009; Hamilton, Martin, & Ventura, 2009). As a result, the United States ranks 30th in the world for infant mortality. The reasons for the increase are unclear (Institute of Medicine, 2007; Macdorman & Mathews, 2009; Takayama & Matsuo, 2010).

Preterm birth, that is, birth occurring at less than 37 weeks of completed gestation, is associated with significantly increased perinatal mortality and morbidity, including low birth weight (<2,500 g). Both neonatal death and morbidity increase as birth weight and gestational age decrease. Improvements in and availability of neonatal intensive care have decreased infant deaths and stillbirths across time (Goldenberg, 2002; Institute of Medicine, 2007). This improvement, however, has resulted in more low-birth-weight infants being born at the lower limits of viability and exceptionally high mortality rates (Institute of Medicine, 2007). Preterm neonates who survive experience serious immediate and long-term neurological and developmental morbidities that affect the family and society (Ashton et al., 2009; Crowther, Hiller, & Doyle, 2009; Honest et al., 2009; Institute of Medicine, 2007). The annual cost of preterm birth to American society is more than $26 billion (Institute of Medicine, 2007).

Reducing preterm labor and preterm birth has been stymied by the lack of understanding of the factors that initiate labor and the causes of preterm birth (Ashton et al., 2009; Institute of Medicine, 2007; Muglia & Katz, 2010). Causes of preterm birth are believed to be due to complex multiple etiologies of medical complications, biological and genetic factors, behavioral and psychosocial issues, exposure to environmental teratogens, and infertility treatments (Ashton et al., 2009; Institute of Medicine, 2007; Muglia & Katz, 2010). Preterm birth is categorized as either spontaneous or elective. The cause of spontaneous preterm birth, which occurs in 60% to 70% of pregnancies, is unknown and includes diagnoses such as spontaneous preterm labor or rupture of membranes and cervical weakness, placental abruption, and infection (DiRenzo et al., 2006; Honest et al., 2009; Muglia & Katz, 2010). Between 30% and 50% of these births are caused by infection of the fetal membranes and maternal systemic system, including periodontal disease (Crowther, Thomas, Middleton, Chua, & Esposito, 2009; Goldenberg, 2002). Elective preterm birth, which occurs in 30% to 40% of women, results from medical intervention for maternal or fetal complications such as sepsis, fetal distress, or fulminating preeclampsia (Allen, Joseph, Murphy, Magee & Ohlsson, 2004; Honest et al., 2009; Zhang, Neikle, & Trumble, 2003).

Prevention of preterm birth focuses on identifying and reducing risk using perinatal monitoring systems and risk screening tools so that health care providers can intensively monitor women and initiate interventions to reduce adverse outcomes (Andolesk & Kelton, 2000; Institute of Medicine, 2007; Honest et al., 2009; Jordan & Murphy, 2009; Lyerly et al., 2009). Factors indicative of increased risk for preterm birth can be physiological, psychosocial, behavioral, and sociodemographic in nature (Institute of Medicine, 2007). Major physiological risk factors include a history of previous preterm birth, multiple gestation, vaginal bleeding from a placenta previa or abruption, second trimester bleeding, and disease states such as hypertension or diabetes (Goldenberg, 2002; Institute of Medicine, 2007; Society of Obstetricians and Gynaecologists of Canada, 2008). Psychosocial risk factors include problems such as stress, which is associated with preterm birth, lower birth weight, small for gestational age, fetal birth defects, and developmental delay (Anhalt, Telzrow, & Brown, 2007; Giscombe & Lobel, 2005; Krabbendam et al., 2005; Nkansah-Amankra, Luchok, Hussey, Watkins, & Liu, 2010; Wadhwa et al., 2002). Behavioral risk factors include substance use, particularly smoking, which is associated with increased risk of preterm birth, low birth weight, and small for gestational age (Agrawal et al., 2010; Institute of Medicine, 2007; Raatikainen, Huurrinainen, & Heinonen, 2007).

Sociodemographic risk factors for preterm birth include the extremes of maternal age, low education, socioeconomic status, and maternal race/ethnicity (Institute of Medicine, 2007; Osterman, Martin, & Menacker2009; Whitehead, Callaghan, Johnson, & Williams, 2009; Wise, Heffner, & Rosenberg, 2010). Racial disparities in preterm birth exist (Institute of Medicine, 2007). The rate of preterm birth is 17.8% for African American women compared with 10% to 11.5% for White, Hispanic, Asian, and Pacific Islander women (Ashton et al., 2009; Institute of Medicine, 2007; Osterman et al., 2009; Muglia & Katz, 2010; Whitehead et al., 2009). The causes of disparity are unclear (Institute of Medicine, 2007; Fry-Johnson & Rowley, 2010; Muglia & Katz, 2010; Paul, Boutain, Manhart, & Hitti, 2008; Whitehead et al., 2009). The use of risk assessment tools, however, has not been successful in predicting preterm birth. Between 10% and 30% of women designated as high risk have normal outcomes, and 20% and 50% of those designated as low risk have a preterm birth or low-birth-weight infant (Andolsek & Kelton, 2000). Others report, however, that conceptualization of pregnancy as at risk leads to unnecessary interventions (Jordan & Murphy, 2009; Lyerly et al., 2009).

The goals of treatment to prevent preterm birth are to reduce uterine contractions in order to delay time to delivery and to optimize fetal status (Goldenberg, 2002). Delay of birth allows time for fetal development to offset the effects of extreme low birth weight and prematurity and for administration of a single course of antenatal corticosteroids that stimulate fetal lung development and reduce neonatal respiratory distress syndrome (Crowther & Harding, 2009; National Institutes of Health, 1994). Delay also allows transfer to a tertiary medical center, as birth near a neonatal intensive care unit is a major predictor of neonatal survival (DiRenzo et al., 2006; Goldenberg, 2002; Institute of Medicine, 2007).

There is considerable variation in the management of preterm labor and preterm birth prevention (Goldenberg, 2002; Institute of Medicine, 2007). Therapeutic treatments include tocolytic drugs, antibiotics, cervical cerclage, bed rest/activity restriction, hydration, sedation, home uterine monitoring, nurse home visitation, and psychosocial support, but the majority are ineffective (Goldenberg, 2002; Institute of Medicine, 2007). Some tocolytic drugs temporarily delay preterm birth, allowing for corticosteroid treatment, but there is no evidence that tocolysis prevents preterm birth (Anotayanonth, Subhedar, Neilson, & Harigopal, 2010; Crowther, Hiller, et al., 2009; Goldenberg, 2002; Institute of Medicine, 2007). Antibiotics are used for treating suspected maternal infections, especially Group B streptococcus, which is a cause of significant neonatal morbidity and mortality, but are not effective for the single purpose of preventing preterm birth. Cervical cerclage is also ineffective, but further research is needed to differentiate the various causes of a shortened cervix. Lastly, there is also no evidence for the efficacy of maternal hydration, sedation, home uterine monitoring, and bed rest (Institute of Medicine, 2007; Maloni, 2010; Meher, Abalos, & Caroli, 2010; Say, Gulmezoglu, & Hofmeyer, 2010; Sosa, Althabe, Belizán, & Bergel, 2010).

Some interventions are associated with adverse effects and are of concern. Tocolytic drugs are associated with maternal pulmonary edema and cardiac arrhythmia, and magnesium sulfate is associated with increased fetal and neonatal death (Anotayanonth et al., 2010; Crowther et al., 2009; Goldenberg, 2002; Institute of Medicine, 2007). Antepartum bed rest is associated with an array of physiological and psychological side effects, including muscle atrophy, cardiovascular deconditioning, maternal weight loss, and decreased infant birth weight, depression, and major family problems (Maloni, 2010). In contrast, leisure physical activity is associated with a reduction in preterm birth (Domingues et al., 2009; Evenson, Siega-Riz, Savitz, Leiferman, & Thorp, 2002; Institute of Medicine, 2007). The repeated use of ineffective interventions, especially those with major side effects, suggests lack of attention to research evidence and also suggests that evidence-based practice has not been well integrated into obstetric clinical practice (Fox, Gelber, Kalish, &

Chasen, 2009, Goldenberg, 2002; Maloni, 2010; Muglia & Katz, 2010; Sprague, O'Brien, Newburn-Cook, Heaman, & Nimrod, 2008).

It is unclear whether preterm birth is preventable (Ashton et al., 2009; Institute of Medicine, 2007; Muglia & Katz, 2010). Both the Institute of Medicine and the Surgeon General call for increased multidisciplinary research efforts into biomedical and epidemiological factors and psychosocial and behavioral issues (Ashton et al., 2009; Fry-Johnson & Rowley, 2010; Honest et al., 2009; Institute of Medicine, 2007; Muglia & Katz, 2010). Increased understanding of the process of parturition, the multiple causes of preterm birth ,predictive biomarkers, risk factors, and the factors influencing the rise in preterm births is needed before effective interventions can be created (Ashton et al., 2009; Institute of Medicine, 2007). Future efforts to prevent preterm birth include implementation of evidence-based practice assisted by professional education and training, and a return to doing what works, such as regionalization of perinatal care rather than interhospital competition driven by reimbursement (Braillon & Bewley, 2010; Goldenberg, 2002; Institute of Medicine, 2007). Further, reconceptualization of prenatal care is needed as the current model does not meet the needs of women at risk for preterm birth, particularly when intensive monitoring occurs during the last weeks of pregnancy and not when early signs of complications emerge (Goldenberg, 2002; Lu, Tache, Alexander, Kotelchuck, & Halfon, 2003; Maloni, 2010). Prenatal care for high-risk pregnancies also needs to include intrapregnancy care for continued follow-up between pregnancies to improve maternal preconception health (Ashton et al., 2009). Ultimately, increased access to insurance and provision of quality woman's health care across the life span, beginning at birth, may be most effective in promoting both maternal and fetal/neonatal health (Ashton et al., 2009; Maloni, 2010).

Judith A. Maloni

PRIMARY NURSING

Primary nursing is a delivery system for nursing care. A delivery system is a set of organizing principles that is used to deliver a product or service. It generally consists of four elements: decision making, work allocation, communication, and management. There are four prototypical delivery systems used in hospital nursing: functional nursing, team nursing, total patient care, and primary nursing. Each of these systems defines the four organizing elements differently.

Primary nursing clearly allocates decision-making responsibility for care delivery and care management to a specific RN. This individual establishes the responsibility relationship by explaining it to the patient and his or her family. Commensurate with this responsibility, the RN has the authority to decide, in partnership with the patient whenever possible, how nursing care will be given to this patient. This plan of care is to be followed by others caring for the patient when the primary nurse is not there, unless the patient's condition changes. The primary nurse role includes giving direct care as well as comprehensive patient care planning and coordination. Full implementation of the primary nursing system has a major impact on all roles and relationships among the staff and among other health professionals.

Primary nursing is the only nursing care delivery system that clearly establishes the role autonomy characteristic of a true profession. Successful implementation requires a transformational change process. On the basis of the theory of decentralized decision making, the system requires the staff to become empowered, which in turn mandates a workplace culture that includes good teamwork and effective leadership.

Primary nursing was developed by a staff of nurses on a 23-bed medical unit at the University of Minnesota Hospitals in 1968. The overall project goal was to improve the delivery of support services to nursing units, and Station 32 was the pilot unit. In the course of multiple changes in a wide variety of services, frustration with team nursing led the staff to innovate in organizing their own work. As their practice changed, it became apparent that a new delivery system was being created. The result of that innovation became primary nursing. It is important to note that this development was initiated by the nursing staff of an operating unit.

The year l970 saw the first seminar presenting primary nursing to the nursing community and the first published article about it, *Primary Nursing: A Return to the Concept of "My Nurse" and "My Patient"* (1). Throughout the 1970s, interest in primary nursing was steady but had not yet led to an organized movement. Several hospitals quickly realized the benefits to patients and nurses. The nursing departments at Boston Beth Israel Hospital, led by Joyce Clifford, and Evanston Hospital, led by June Werner, were early adaptors and were recognized as outstanding models of full implementation of a professional practice model.

The concept continued to spread gradually across the United States and then to other countries. *The Practice of Primary Nursing* (1) was published in 1980. Articles on the subject appeared in American nursing journals throughout the 1970s and 1980s.

There was a continuous call for research to prove the benefits of primary nursing. The challenge of conducting well-designed research projects within the context of operating patient care units has consistently been recognized. Despite these difficulties, hundreds of studies and articles have been published globally.

A misconception that has plagued primary nursing is the myth that more RNs and/or more staff in general are required for its implementation, making it more expensive than other care delivery systems. Although an all-RN staff has never been part of the formal definition, many leaders in both education and practice have assumed that to be a requirement. In the first wave of implementation of primary nursing in the United States in the 1970s and 1980s, some nurse leaders used it as a way to increase the RN ratios in their skill mix, thus perpetuating the myth of the all-RN staff. However, by the 1990s, staff reductions across the United States forced reintroduction of larger numbers of support staff, with the result that many nurse managers felt they had to give up primary nursing. To this day, these misconceptions about resource requirements for primary nursing are believed by many health care industry leaders.

Abbreviated lengths of stay, 12-hour shifts and part-time positions have all contributed to a commonly held belief that primary nursing does not work in short-term, high-acuity situations. However, recent innovations in implementing the fundamental delivery system principles have resulted in changes in both role expectations and role management. The simple notion of short-term goals for short-term patients has freed nurses to achieve implementation that is pragmatically appropriate for the fast pace of today's hospitals. The understanding that a responsibility relationship enhances patient care and creates a more professional role for RNs is reemerging in today's practice settings.

The wide variety of settings in which nurses practice today has also resulted in recognition that primary nursing works in any setting. It is about establishing a responsibility relationship between a nurse and a patient—whether in the patient's home, a long-term care setting, an ambulatory center, or an acute-care setting. Primary nursing is a responsibility relationship that enhances patient care and the profession of nursing.

Although changes in the health care system seem to frequently negatively impact primary nursing, the experience of more than 40 years demonstrates that after a period of initial adjustment, interest in primary nursing returns, and nurses again apply the organization principles to the new reality to return to relationship based care. The application of these principles throughout a hospital system, often called Relationship-Based Care, results in positive changes to the hospital culture. When this level of system wide change is successful, patients will experience, in addition to a primary nurse, a primary physical therapist, primary pharmacist, and so forth.

Marie Manthey

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Qualitative Research

Qualitative research includes all modes of inquiry that do not rely on numbers or statistical methods. However, the terms *qualitative* and *quantitative* research are misnomers, albeit commonly used. The terms *qualitative* and *quantitative* actually refer to the forms of the data, not to specific research designs. It is more accurate to discuss naturalistic and positivistic designs during which qualitative or quantitative data may be collected. For this reason, the subject usually considered under the topic of qualitative research will be called *naturalistic inquiry* here.

Naturalistic approaches comprise a wide array of research traditions, most often in the categories of ethnography, grounded theory, and phenomenology, but they also include ethnology, ethnomethodology, hermeneutics, oral and life histories, discourse analysis, case study methods, and critical, philosophical, and historical approaches to inquiry. Each tradition has a distinct set of undergirding philosophical or theoretical orientations, strategies for data collection and analysis, and forms of research products.

The ultimate purpose of all research is the generation of new knowledge. However, different modes of inquiry produce different kinds of knowledge. Knowledge developed from naturalistic methods is at the level of rich description or in-depth understanding. Naturalistic inquiry tends to be exploratory in nature and is particularly useful in identifying important contextual features of the phenomenon. Naturalistic approaches are called for when the purpose of the research is to obtain in-depth information about a phenomenon, when little is known about a topic, or when new perspectives are needed. Secondary purposes for naturalistic approaches include generating hypothesis, obtaining the range of possible items for instrument development, providing illustrative examples or cases, and delineating the context from which other data may be better interpreted.

There are several features that are common to most naturalistic studies. A basic tenet is that reality is socially constructed; as such, there are multiple realities for any phenomenon, given the multiple lenses through which different individuals perceive and experience a situation. Naturalistic approaches favor conducting research in the field setting (vs. an artificial laboratory) to observe phenomena as they are lived and to preserve the contextual elements of the phenomena. In contrast to positivist approaches, which use established instruments, in naturalistic inquiry, the investigator is the instrument. However, investigators are aware that their own experiences, biases, and perceptual sets particularize both the data that they elicit from informants and ultimately the data analysis and interpretation. There are generally accepted standards for rigor in naturalistic approaches. These include the degree of intimacy of the investigator to the informants, the auditing of interviews and coding structures, trustworthiness, dependability, conformability, meaning in context, and saturation/redundancy.

Naturalistic approaches (also known as *constructivist or inductive inquiry*, *Paradigm II*, or *field approaches*) are often contrasted with positivist approaches (also called *empiricism*, *Paradigm I*, or *experimental approaches*). Naturalistic and positivistic modes of inquiry provide different types of data. However, these data sets are most fruitfully viewed as complementary rather than in opposition. Together, they provide a more complete understanding than can be obtained by using either approach singly. Sometimes the methods can be employed simultaneously (methodological triangulation); at other times, the methods must be applied sequentially to satisfy the requirements of each. The reciprocal interweaving of naturalistic and positivist research builds nursing knowledge as each contributes different but important information.

Specific approaches to naturalistic inquiry were developed primarily in the social sciences and philosophy. For example, phenomenology as a method derived from phenomenological and existentialist philosophy, ethnography from anthropologists' study of culture, grounded theory, and ethnomethodology from sociology (specifically the school of symbolic interactionism).

In the discipline of nursing, there were several early reports of qualitative data without a specified naturalistic approach. In 1952, the first issues of the first volume of *Nursing Research* articles report the qualitative results of unstructured interviews.

In 1962, nurse scientist graduate training programs were initiated through the division of nursing for the purpose of increasing the number of nurse research scientists with doctorates in basic physiological or social sciences. As a result, many nurses completed programs that trained them in the qualitative methods developed in the social sciences. Many nurse anthropologists were trained during this period.

Over the decade of the 1960s, the number and methodological specificity of naturalistic inquiry increased. By the end of the 1960s, *Nursing Research* had published articles specifically using grounded theory methods, ethnographic methods, and other naturalistic approaches. *Image: The Journal of Nursing Scholarship* was initiated in 1966 and also published research using naturalistic methods (although positivist approaches predominated in both journals). With the advent of the *Western Journal of Nursing Research* in 1978, edited by Brink, there emerged an outlet with a balanced representation of qualitative research. In 1976, Paterson and Zderad published a book based on phenomenological observations, and Brink's (1976) book contained a series of methodological articles on conducting qualitative (largely ethnographic) research. Nearly a decade later, two broad-based books on qualitative research were published (Field & Morse, 1985; Leininger, 1985b). With the advent of the journal *Qualitative Health Research* in 1991, also edited by a nurse anthropologist, Morse, an entire journal was fully dedicated to reporting naturalistic research. The Transcultural Nursing Care series organized by Leininger from 1977 to the present offered an opportunity for the presentation of naturalistic research.

The selection of a particular naturalistic approach depends on the purpose of the research. For example, phenomenology is the method of choice when the purpose is to understand the meaning of the lived experience of a given phenomenon for informants, grounded theory is selected to uncover or understand basic social processes, and ethnography is selected to understand patterns and processes grounded in culture.

Although most qualitative approaches do not employ formal theoretical frameworks, they do rest on established philosophical assumptions. However, some naturalistic inquiry (particularly ethnography) is conducted in the context of theoretical orientations that reflect the training of the investigator and may focus attention on particular phenomena, relationships, data collection techniques, or research products.

In most forms of naturalistic inquiry, investigators typically use participant observation, informant interviews, and document analysis. However, the extent to which the investigator relies on any one strategy will vary. For example, phenomenology relies primarily on informant interviews, ethnography, and grounded theory and generally has a more even reliance on participant observation and interviewing, whereas ethnology relies primarily on observations.

Methods for data manipulation include strategies for taking notes, making memos, and coding and indexing systems. More recently, computerized software programs such as ETHNOGRAPH, NUD*IST, and MARTIN have been fruitfully employed to aid in the management of data. Methods used in data analysis are inductive and include matrix, thematic, and domain analysis. Finally, the form of the final product may vary. In grounded theory, a substantive theory with a process model is common; in ethnoscience (a form of ethnography), a taxonomic structure is the product.

In summary, naturalistic inquiry most commonly occurs in field settings, with investigators collecting data through participant observation and unstructured interviews and analyzing data through thematic content analysis. It developed initially in the social sciences and began to be incorporated in nursing research in the 1960s and 1970s. Today, it is an accepted scientific approach that complements knowledge derived from positivist inquiry.

Toni Tripp-Reimer
Lisa Skemp Kelley

QUALITY OF CARE

Health care quality is commonly assessed through measurement of patient safety indicators in hospitals, that is, analyzing hospital administrative data and conducting nurse and physician retrospective chart reviews to identify adverse events or medical errors (Agency for Healthcare Research and Quality, 2010b; Health and Human Services [HHS], 2010). Research findings show that medical error mortality and morbidity have been a continuing epidemic in the United States over the past three decades (Brennan et al., 1991; HealthGrades, 2010; HHS, 2010). Recent studies indicate that patient mortality associated with medical errors and suboptimal or substandard medical care in hospitals ranks as the third leading cause of death in the United States (Heron, 2010; HHS, 2010; Landrigan et al., 2010). Annually, an estimated 180,000 Medicare patients die as a result of harm from the medical care they received during hospitalization, and 27% (3,216,000) of Medicare patients are harmed by medical care received during hospitalization (HHS, 2010). The study findings of HHS (2010), HealthGrades (2010), and Landrigan et al. (2010) indicate that while there has been no overall statistically significant improvement in medical error morbidity or mortality rates over the past three decades, there have been significant increases in some categories of hospital medical error harm.

Attempts to measure the concept of quality date back to the 1970s and have more recently taken center stage. Since the release of the landmark Institute of Medicine (IOM, 1999) report that estimated up to 98,000 patients die annually as a result of hospital medical errors, measuring quality and reducing health care costs and patient harm associated with medical care have garnered renewed emphasis and funding. Efforts have been made to harmonize common medical error, patient safety, and quality lexicon and taxonomy across government and nongovernmental enterprises (National Quality Forum, 2009), although fragmentation still exists.

Care providers today are expected to provide evidence-based, high-quality, accountable, and patient-centered care at a reasonable cost while attending to the increasing expectations by consumers for more information about care choices and quality outcome data. Gallagher and Rowell (2003) suggested that the provision of outcome-oriented, cost-effective health care is no longer a goal but a mandate. Part of the issue in health care today, according to the assumptions presented by these authors, is that the costs, processes, and outcomes of care are so interrelated and reciprocal that changes in one of these areas may have significant effects on the other components. On October 1, 2008, the Centers for Medicare and Medicaid Services (2007) implemented a policy that began a paradigm shift in the established model for quality measurement and reimbursement, that is, hospitals will no longer be paid for preventable medical errors defined as hospital-acquired conditions (HACs).

Recommendations included in the IOM (1999) report on the quality of health care in hospitals remain a focal point of national efforts to improve the quality of health care in the United States. The IOM stated that "Health care today harms too frequently and routinely fails to deliver its potential benefits" (IOM, 1999). This report further states that all health care should be "safe, effective, patient-centered, timely, efficient, and equitable" (IOM, 1999, p. 6). The IOM adopted a definition that states that "quality is the degree to which health services for individuals and populations increase the likelihood of desired outcomes and are consistent with current professional knowledge" (IOM, 1999, p. 244). Patients receive quality care when the services provided are technically competent, provide good communication, share decision making with the patient and family, and are culturally sensitive.

Donabedian's (1980) model of quality measurement based on structure, process, and outcome has become the foundation of most current strategies to measure quality of care in health care systems. Using Donabedian's model, quality can be evaluated based on the three components of structure, process, and outcomes (IOM, 1999). Using this framework, *structural quality* evaluates the capacity of the health care structure to provide high-quality care. In nursing, this requires LPNs, RNs, nurse practitioners, and other advanced practice nurses to evaluate how the unit's structure and that of the larger organization affect quality of care for the patients under their care. Measures of structure have primarily included cost and financial resources required to provide care, as well as human resources such as skill mix, staff characteristics, patient severity of illness factors, and environmental factors of the hospital or care agency. During the 1970s and 1980s, patient classification systems were developed but were never extensively implemented. More recently, diagnosis related groups and nursing diagnoses are frequently used separately or together to describe patient characteristics in research and care effectiveness evaluations.

A second component of quality is *process quality*, which focuses on the interactions of nurses with their clients. In nursing, a very process-focused discipline, we see the historical contribution of care plans as an important process tool, and more recently, critical paths and care maps have added to this process focus. The best process measures are based on research evidence that the process leads to better outcomes for patients. In today's health care system, most attempts to measure quality focus on process evaluation by assessing the appropriateness of care and the adherence to professional standards. Discharge planning and case management are nursing interventions included in the Nursing Interventions Classification that focus on achieving quality care through a process format (Dochterman & Bulechek, 2004).

A third component of quality is *outcomes*, which provides evidence of the effectiveness of the interventions nurses provide for the health problems and concerns of patients. The IOM (1999) report states that the best measures of outcomes are those tied to the process of care. Attempts by nurses to enhance quality strategies, such as *critical paths* and *care maps*, have challenged the sacred care plan in nursing and have shifted nurses' thinking from goals to outcomes. Some of these paths and maps have included standardized nursing languages as content areas for nursing. The Nursing Outcomes Classification (NOC; Moorhead, Johnson, & Maas, 2004) was developed to measure the effectiveness of nursing interventions. Used with the Nursing Interventions Classification and diagnoses from the North American Nursing Diagnosis Association international, the outcomes are designed to measure the effectiveness of the nursing process. Linkage of these three classifications through a recent publication assists nurses and students to use these languages more effectively (Johnson et al., 2001). The NOC has 330 outcomes that measure along a continuum an individual, family, or community state, behavior, or perception in response to a nursing intervention. Each outcome has an associated set of indicators that are measured to determine the patient, family, or community status in relation to the outcome. Examples of some of the outcomes relevant to a discussion of quality are pain control, symptom control, quality of life, participation in health care decisions, asthma self-management, cardiac disease self-management, risk control, and knowledge disease process. Use of this classification in practice settings with an evaluation of the outcomes achieved provides needed knowledge to nurses related to the effectiveness of the interventions provided and the care planning process. This evaluation of real patient data on outcomes allows for a continual review of the structure, process, and outcomes of nursing care.

The current environment also is challenged to meet patient expectations. Because of this, NOC has added 14 client satisfaction outcomes to measure patient perceptions of their care. Private nonprofit organizations such as the National Committee for Quality Assurance have been created to improve health care. This organization evaluates health plans in the areas of patient safety, confidentiality, consumer protection, access, and continuous improvements. They have both accreditation and performance measurement programs that provide information to consumers.

The public health imperative and challenges to measure quality and improve patient outcomes are not new issues in the health care system. There is evidence that the genesis of a paradigm shift in the health care quality and safety movement is underway. What can be viewed as a fourth component has recently been added to Donabedian's three-component quality evaluation model: The fourth component is an economic incentive to improve patient outcomes, that is, hospitals will no longer be paid for additional costs associated with certain preventable hospital medical errors, HACs. Attention must remain on these key four factors as nurses and other health care providers develop better structures, processes, outcome measures, and awareness of HACs to evaluate and improve the effectiveness of the care we provide. This desire and support for providing safe, high quality of care is central to nursing practice.

Patti Hart O'Regan

QUALITY OF LIFE

Although quality of life (QOL) holds inherent meaning to most people and has been studied extensively in a broad range of contexts and from various research perspectives, the precise definition and measurement of QOL remains elusive. Differences in how QOL is operationalized have made comparisons between studies difficult (Garratt, Schmidt, McIntosh, & Fitzpatrick, 2002). QOL is composed of broad concepts of life satisfaction and welfare, including adequate social, educational, environmental, political, and economic conditions, including accessibility; family safety and well-being; leisure pursuits; and physical, emotional, and spiritual health (Anderson & Burckhardt, 1999; Bergner, 1989; Frank-Stromberg & Olsen, 2004). However, these (and other) global QOL concepts may be too broad and inclusive to be meaningfully operationalized in research (Bard, 1984).

Thus, interest in the systematic assessment of specific dimensions of QOL, such as health-related quality of life (HRQOL) has emerged in research and clinical practice (Bergner, 1989). One formal definition of HRQOL is, "the extent to which one's usual or expected physical, emotional, and social well-being are affected by a medical condition or its treatment" (Cella, 1995). This definition encompasses both the subjectivity and multidimensionality of the concept of HRQOL, two important aspects of QOL (Aaronson, 1988). The following paragraphs describe QOL in a health-related context for use in nursing research and practice; thus, the term *QOL* is used interchangeably with *HRQOL* (Varricchio & Ferrans, 2010).

Nursing and other health care researchers are most often interested in determining how disease or injury or the treatment of disease or injury affects QOL. Similarly, health promotion researchers may use specific QOL constructs to ascertain the effectiveness of measures taken to enhance or improve mental, physical, social, or spiritual health. Health care policy makers and third-party payers may use HRQOL information in public policy and reimbursement decision making.

The importance of QOL research is evident through federal funding of health research. For example, strategic areas of research emphasis of the National Institute of Nursing Research (NINR) include many opportunities for research that will improve QOL by enhancing individuals' role in managing disease, relieving symptoms of disease and disability, and improving outcomes (NINR, 2006). Included in the NINR emphasis on QOL are self-management, symptom management, and caregiving. The Centers for Disease Control and Prevention also have a division for HRQOL that provides measures and data for tracking various aspects of population health (www.cdc.gov/hrqol/index.htm).

QOL phenomena amenable to nursing studies have enjoyed a long history of published research. Using the key terms *quality of life* and limiting the search to *research* publication type and *nursing journals*, a recent Cumulative Index to Nursing and Allied Health Literature search yielded 5,147 articles published between 1977 and August 2010, with 2,675 or 52% published since 2005. Similarly, an identical Cumulative Index to Nursing and Allied Health Literature search for *health-related quality of life* yielded 518 articles published between 1993 and August 2010, with over half (n = 282) published since 2006. These data-based research publications demonstrate the prolific nature of HRQOL research in nursing.

QOL research is vital to individual- and population-level clinical and policy decision making and implementation and comparative effectiveness research (Gatsonis, 2010; Guyatt, Feeny, & Patrick, 1993; Kaplan and Bush, 1981; Lauer & Collins, 2010). The American Recovery and Reinvestment Act of 2009 brought comparative effectiveness research to the forefront in an era of health care reform by appropriating $1.1 billion solely to comparative effectiveness research, $400 million to the National Institutes of Health, and the remainder to the Agency for Healthcare Research and Quality (Lauer & Collins, 2010). Within this new and evolving research context, it will be important for QOL phenomena to remain cogent determinants of clinical decision making. One of the major challenges for nurse scientists in this new research infrastructure will be to deliver meaningful, multifaceted, yet granular QOL information for evidence-based clinical decision making.

In a recent concept analysis, Plummer and Molzahn (2009) used critical appraisal of the literature to enhance conceptual clarity of QOL from a nursing perspective with five nursing theorists (Peplau, Rogers, King, Leininger, and Parse). A provisional definition was proposed based on the synthesis of the theorists' definitions of QOL as "an intangible, subjective perception of one's lived experience" (Plummer and Molzahn, 2009). Although the theoretical paradigms analyzed by Plummer and Molzahn (2009) encompass the holistic perspective of the lived experience in QOL, researchable middle-range theories can provide the substructures needed to build unique nursing knowledge on QOL and make comparisons between studies that will sufficiently translate into clinical practice and improved outcomes.

Ferrans and Powers (1985, 1992) developed and empirically verified the Quality of Life Index (QLI), which has moved the science forward in aspects of QOL where nurses can intervene. Weighted satisfaction responses based on subjective (i.e., patient) importance ratings are used in the QLI, such that scores reflect satisfaction with patient-valued aspects of life. The QLI produces five scores, including overall QOL, in four domains, health and functioning, psychological/spiritual domain, social and economic domain, and family. Although a generic form of the QLI is composed of common items, individual versions of the questionnaire consist of additional items pertinent to specific illnesses and disorders.

Methodological and logistic challenges in QOL measurement can be daunting. Thorough knowledge of conceptual and psychometric aspects of a QOL measure is essential in research. Instruments must adequately capture the conceptualization of QOL and must be sensitive to changes over time. Other considerations needed when selecting instruments is the level of measurement (e.g., individuals or populations), the study design (e.g., cross-sectional vs. longitudinal, quantitative vs. qualitative), and whether objective, subjective, or a combination of both objective and subjective measures are needed (e.g., QOL relative to a particular disease or illness, where objective assessments are included). Many studies employ multiple instruments, which allow flexibility in the conceptualization of QOL while permitting comparability of specific dimensions across studies (Frank-Stromberg & Olsen, 2004).

Limitations of QOL research include (a) lack of meaningful findings that can be used to base clinical and treatment decisions upon, (b) heterogeneity of treatment effects across similar or identical patient populations, (c) varying levels of perceived QOL and health across time, (d) multicultural and linguistic translation of QOL instruments, (e) the amount and complexity of factors influencing QOL, and (f) use of surrogate measures for QOL, such as health, symptoms, or functional status, alone for measuring HRQOL (Guyatt, 1997; Plummer and Molzahn, 2009). In addition, some of the questionnaires are lengthy and complex, rendering them clinically unusable due to the added measurement burden they would impose on patients and clinicians. Thus, little continues to be known about dimensions of QOL most amenable to nursing intervention. This lack of knowledge is a critical problem because, without this understanding, delivery of effective interventions aimed at improving QOL is unlikely. However, efforts are being made to address these issues.

Using the example of heart failure, the Kansas City Cardiomyopathy Questionnaire (KCCQ), designed to collect subjective measures of QOL and other health status measures, has been empirically verified in numerous domestic and international studies. The KCCQ is a self-administered 23-item questionnaire that quantifies heart-failure-specific domains, including physical limitation, symptoms (frequency, severity, and recent change over time), self-efficacy, social interference, and QOL (Green et al., 2000). The KCCQ was found to be reliable, responsive, and valid in study comparisons with the 6-minute walk test, New York Heart Association functional status classification, the medical outcomes Short Form-36, and Minnesota Living with Heart Failure questionnaire. The KCCQ captures multiple dimensions of QOL and health status and may replace the need for using multiple QOL instruments in research and practice. Applications of the KCCQ have been made in research, quality assessment, and clinical practice (Heidenreich et al., 2006; Hertzog, Pozehl, & Duncan, 2010; Soto, Jones, Weintraub, Krumholz, & Spertus, 2004). The emphasis for future nursing research must include measures that can be used to support clinical decision making in improving patients' QOL in health and illness and to provide the underpinnings for health care policy and reimbursement decisions in an era of health care reform and economic uncertainty.

K. M. Reeder

QUANTITATIVE RESEARCH

Quantitative research consists of the collection, tabulation, summarization, and analysis of numerical data for the purpose of answering research questions or hypotheses. The term *quantitative research* is of recent origin and is distinguished from qualitative research in design, process, and the use of quantification techniques to measure and analyze the data. The vast majority of all nursing studies can be classified as quantitative.

Quantitative research uses statistical methodology at every stage in the research process. At the inception of a research project, when the research questions are formulated, thought must be given to how the research variables are to be quantified, defined, measured, and analyzed. Study subjects are often selected for a research project through the statistical method of random sampling, which promotes an unbiased representation of the target population among the sample from whom generalizations will be made. Statistical methods are used to summarize study data, to determine sampling error, and in studies in which hypotheses are tested, to analyze whether results obtained exceed those that could be attributed to sampling error (chance) alone. The important role of statistical methodology in quantitative research should not obscure the fact that other methodologies and scientific disciplines play important roles in nursing research. These methods are used in the delineation of research questions and hypotheses, exposition of conceptual frameworks and hypotheses, design of data collection instruments and tools, and interpretation of study data, particularly determination of the clinical significance of the data and dissemination of findings.

Much of the history of nursing research involves quantitative research. Florence Nightingale, who was a skilled statistician, used quantitative measures to describe and evaluate hospital performance (Nightingale, 1858). Studies of nursing in the United States, beginning in the 1940s, used quantitative techniques to survey and analyze nursing education and supply and distribution of nurses. In the 1960s, with support from the federal government, research in nursing began to use advanced research designs, such as controlled experiments, which made extensive use of quantitative tools, techniques, and processes.

Quantitative data collected in quantitative research are obtained by the use of measurement scales. There are three distinct types of scales: nominal, ordinal, and continuous. Nominal scales consist of two or more ungraded or unranked categories of variables, such as eye color (green, blue, brown) or political affiliation (Republican, Democrat). Ordinal scales possess categories that are ranked or graded from high to low, small to large, near to far. Graded scales, such as the Likert and Guttman scales, are commonly used in nursing research to measure intensity of opinions, attitudes, and other psychological variables. When nominal and ordinal scales are used, quantitative summaries of the data collected consist of aggregating the number of responses in each scale category, converting them to relative frequencies such as percentages, and if hypotheses are being tested in the research, applying one of many nonparametric techniques available to test the statistical significance of the data.

Continuous scales have continuous quantitative values rather than verbal categories, as in nominal and ordinal scales. These include the scientific measuring instruments widely used in nursing to measure variables such as temperature, weight, height, and blood pressure. Continuous measurement scales have certain advantages over other scales because they yield more precise and sensitive data. Also, the statistical significance of continuous data can be analyzed by the more powerful parametric techniques.

Quantitative research is concerned with making generalizations from a study sample to a target population, a process called *statistical inference*. There are two categories of generalizations in quantitative research: (a) estimates of the quantitative value of selected characteristics of a target population and (b) results of tests of statistical hypotheses concerning relationships among variables in the target population. Studies in the first category are called *descriptive studies*; those in the second category are called *analytical or explanatory studies*. The focus of many early nursing studies was to describe nurses and nursing practice using questionnaire or interview techniques to collect data from large samples of respondents. Recent studies using conceptual frameworks from emerging nursing theories and models have tested hypotheses in controlled or semicontrolled settings.

Statistical techniques are used extensively in descriptive studies to compute summary measures, such as means, standard deviations, and coefficients of correlation, and to determine the sampling error of the measures. In explanatory studies, statistical techniques are used to test whether there are significant relationships among study variables that are delineated in the hypotheses, meaning relationships that cannot be explained by random sampling error (chance). Widely used statistical techniques to test hypotheses include parametric tests such as the *t* test and analysis of variance and nonparametric tests such as chi-square test and rank–order correlation.

Quantification in nursing research has helped advance nursing as a scientific discipline. Quantification offers many advantages to nursing research. There is a rich set of statistical tools available for data analysis that can be applied to practically every research question to assist in summarizing the data and evaluating their statistical significance. The internal and external validity of the data of quantitative research can be readily verified by other researchers. Results of similar quantitative studies can be synthesized and analyzed by the meta-analysis technique to shed new light on the research questions. Dissemination of the results of quantitative research is facilitated by the clarity and objectivity possessed by quantitative data.

Some studies in nursing tend to overquantify. Reports of these studies are dominated by statistical data and tests, with a minimum of narrative discussion, providing little interpretation of the clinical significance of results. Sometimes, too little time is spent on evaluation of the quality of data used or on the appropriateness of the statistical tests. Qualitative research, with its focus on meaning and interpretation of data, can help to enrich the results of quantitative studies in nursing. The approach called *triangulation*, which utilizes and integrates methodology from quantitative and qualitative research in a single study, can help achieve the best of both worlds of research methodology.

The history of nursing research reveals a trend from purely descriptive studies of nurses and nursing to the evaluation of the effects of nursing care. Properly applied quantitative research can advance the scientific basis of nursing and provide a potent tool for defining and evaluating the outcomes of nursing care. In the future, quantitative research will play an increasingly valuable role in nursing effectiveness studies. The randomized clinical trial method, perhaps the most quantitative of all research methods, will find increasing application in nursing as attempts are made to determine the efficacy of nursing interventions. Clinically oriented research using methods such as randomized clinical trials requires development of quantitative outcome measures of variables such as quality of care and quality of life. This will stimulate quantitative research to provide the needed measures and indicators. As more replications of quantitative nursing research become available, the research synthesis techniques of meta-analysis will be increasingly applied to expand nursing's knowledge base.

Eugene Levine

QUASI-EXPERIMENTAL RESEARCH

Under *Experimental Research* in this encyclopedia, the definition of Cook and Campell (1979) that experiments are characterized by manipulation, control, and randomization was cited. However, when conducting research in field settings, it is not always possible to implement a study design that meets these three criteria. Quasi-experimental research is similar to experimental research in that there is manipulation of an independent variable. It differs from experimental research because either there is no control group, no random selection, no random assignment, and/or no active manipulation.

Quasi-experimental research is a useful way to test causality in settings when it is impossible or unethical to randomly assign subjects to treatment and control groups or to withhold treatment from some subjects. The main disadvantage of quasi-experimental research is the increased threat to internal validity (see *Experimental Research* for a review of types of design validity). Within quasi-experimental designs, a distinction is made between preexperimental, nonequivalent control group designs and interrupted time series designs. Note also that the boundaries between experimental and quasi-experimental research have blurred. Often, investigators like to define their study as experimental when in fact it is quasi-experimental.

Preexperimental designs are the weakest of the quasi-experimental designs. They may lack a control or comparison group, observation before the intervention (commonly known as *pretests*), or both. Their use is strongly discouraged because they do not permit even remote inferences about the direction and dynamics of change and causality.

Nonequivalent control group designs refer to situations in which naturally occurring groups of subjects are used as a control or comparison group or situations in which it is impossible or unethical to withhold treatment from a given group. Despite the absence of randomization, nonequivalent control group designs can be considered relatively strong designs. The use of a control group and a pretest significantly increase the strength of nonequivalent control group designs. Good pretest data will enable the researcher to improve the level of analysis. When subjects from different settings are used, a nonequivalent control group design may control some threats to internal validity, such as compensatory rivalry and demoralization of controls. When subjects in each group are naturally kept separate, it is less likely that they will have contact with each other, and it is often useful to minimize contact between treatment and control groups.

In time series designs, the researcher does not always use a control group and does not use randomization. An interrupted time series study uses several observations of subjects over time with a treatment given at a specified point (or longitudinally over time, with start and end time points). A time series study can be designed to study the same individuals at specified intervals or to study different individuals at some common point in time. When the researcher studies one group of subjects, the subjects act as their own controls, which provides the researcher with equivalent control groups. Time series designs are used when a control group population is not available. When only one group is available to the researcher, the time series design significantly increases the strength of the research.

Ivo Abraham
Karen MacDonald

R

RELIABILITY

Reliability refers to the consistency of responses on self-report, norm-referenced measures of attitudes and behavior. Reliability arises from classical measurement theory, which holds that any score obtained from an instrument will be a composite of the individual's true pattern and error variability. The error is made up of random and systematic components. Maximizing the instrument's reliability helps to reduce the random error associated with the scores, although the validity of the instrument helps to minimize systematic error (see *Validity*). The "true" score or variance in measurement relies on the consistency of the instrument as reflected by form and content, the stability of the responses over time, and the freedom from response bias or differences that could contribute to error. Error related to content results from the way questions are asked and the mode of instrument administration. Time can contribute to error by the frequency of measurement and the time frame imposed by the questions asked. Error due to response differences results from the state or mood of the respondent, wording of questions that may lead to a response bias, and the testing or conceptual experience of the subject.

There are generally two forms of reliability assessment designed to deal with random error: stability and equivalence. Stability is the reproducibility of responses over time. Equivalence is the consistency of responses across a set of items so that there is evidence of a systematic pattern. Both of these forms apply to self-report and to observations made by a rater. For self-report measures, stability is examined through test–retest procedures; equivalence is assessed through alternative forms and internal consistency techniques. For observational measurement, intrarater and interrater techniques assess the two forms of reliability, respectively.

Stability reliability is considered by some to be the only true way to measure the consistency of responses on an instrument. In fact, stability was the primary manner in which early instruments were examined for reliability. Stability is measured primarily through test–retest procedures in which the same instrument is given to the same subjects at two different points in time, commonly 2 weeks apart. The scores are then compared for consistency, using some form of agreement testing that depends on the level of measurement. Typically, data are continuous; thus, interclass or bivariate correlation coefficients and difference between mean scores are usually assessed. An interclass correlation (ICC) is different than a bivariate correlation as it is computing the relationship among multiple observations of the same variable. Specifically, the ICC as an assessment of stability is determining the consistency of measurements made at different times by the same group of individuals. The ICC is calculated based on mean squares obtained from analysis of variance (ANOVA) models. The ICC examines the individual's "error" (consistency) over time as it relates to "error" inherent in the questionnaire and results in a ratio. The values obtained can range from 0 to 1, with 1 indicating perfect consistency and no measurement error. There are no absolute cutoffs for what level the ICC should be, but a good general rule is that a score below .50 should be carefully scrutinized. An ICC is considered superior to a bivariate correlation as it accounts for more of the error variance inherent in any measure. A bivariate correlation tells the investigator whether individuals who scored high on the first administration also scored high on the second, but it does not provide information on whether the scores are the same.

The problem with stability is that it is not always reasonable to assume that the concept will remain unchanged over time. If the person's true score on a concept changes within 2 weeks, instability and high random error will be assumed—when, in effect, it is possible that the instrument is consistently measuring change across time. Reliance on a 2-week interval for measuring stability may be faulty and must be directly related to the theoretical understanding of the concept being measured.

A special case of stability occurs with instruments that are completed by raters on the basis of their observations. Intrarater reliability refers to the need for ratings to remain stable across the course of data collection and not change due to increased familiarity and practice with the instrument. The ICC assessment procedures can be used for intrarater reliability as for test–retest reliability but will utilize slightly different formula looking at absolute agreement versus consistency. A kappa statistic also can be calculated when dealing with agreement among observers. However, the ICC is adequate to deal with most of these situations, and the kappa statistic has no clear advantage over the ICC.

Equivalence is evaluated in two major ways. The first of these predated the availability of high-speed computers and easily accessed statistical packages. This set of techniques deals with the comparison of scores on alternate or parallel forms of the instrument to which the subject responds at the same point in time. Parallelism means that an item on one form has a comparable item on the second form, indexing the same aspect of the concept, and that the means and variances of these items are equal. These scores are compared through correlation or mean differences in a similar manner to stability. Consistency is assumed if the scores are equivalent. Assessment with alternative/parallel forms is not comparison with two different measures of the concept. It is comparison of two essentially identical tests that were developed at the same time through the same procedures. Therefore, a difficulty with this approach to equivalent reliability is obtaining a true parallel or alternative form of an instrument.

A more common way to look at equivalence is through internal consistency procedures. The assumption underlying internal consistency is that the response to a set of scale items should be equivalent. All internal consistency approaches are based in correlational procedures. An earlier form of internal consistency is split-half reliability, in which responses to half the items' on a scale are randomly selected and compared with responses on the other half.

Currently Cronbach's (1951) alpha reliability coefficient is the most prevalent technique for assessing internal consistency. Developed in the 1950s, the formula basically computes the ratio of variability between individual responses to the total variability in responses, with total variability being a composite of the individual variability and the measurement error. As with the ICC, Cronbach's alpha is a ratio ranging from 0 to 1, with the values closer to 1 indicating less measurement error. The ratio reflects the proportion of the total variance in the response that is due to real differences between subjects. A general guideline for use of Cronbach's alpha to assess an instrument is that well-established instruments must demonstrate a coefficient value above .80, whereas newly developed instruments should reach values of .70 or greater. This should not be taken to indicate that the higher the coefficient, the better the instrument. Excessively high coefficients indicate redundancy and unnecessary items. A special case of alpha is the Kuder–Richardson 20, which is essentially alpha for dichotomous data.

Cronbach's alpha is based on correlational analysis, which is highly influenced by the number of items and sample size. It is possible to increase the reliability coefficient of a scale by increasing the number of items. A small sample size can result in a reduced reliability coefficient that is a biased estimate. A limitation of alpha is that items are considered to be parallel, which means that they have identical true scores; When this is not the case, alpha is a lower bound to reliability; other coefficients for internal consistency, based within models of principal components and common factor analysis (e.g., theta and omega), are more appropriate. Obtaining an adequate alpha does not mean that examination of internal consistency is complete. Item analysis must be accomplished and focused on the fit of individual items with the other items and the total instrument.

Again, observational measures are a special case and require different formulas for the determination of equivalence. Interrater reliability refers to the need for ratings to be essentially equivalent across data collectors and not to differ due to individual rater variability. The ICC is the most appropriate procedure in most situations, although kappa based on percent agreement and controlling for chance may also be acceptable.

Any discussion of reliability as approached through classical test theory should note more recent approaches for test consistency. Of these, generalizability theory (G theory) has received the most attention. Unlike classical test theory reliability, G theory can estimate several sources of random error in one analysis; in the process, a generalizability coefficient is computed. Proponents of G theory believe that its concentration on dependability rather than reliability offers a more global and flexible approach to estimating measurement error.

Another approach to dependability is item response theory that also is not based in classical test theory. While classical test theory is generally more focused on the pattern of response to the test, item response as the name suggests is focused on the response to individual items. Item response theory requires two critical assumptions be made: (a) the scale is unidimensional and (b) the probability of responding to any item is not related to the response to any other item. These two assumptions allow for determining the response characteristics of each item, which then allows for prediction of how any particular subject will respond given a set of factors. Item response theory takes a next step beyond reliability and dependability to predictability. Consequently, item response theory can be considered an approach that bridges reliability and validity through predictability.

Paula M. Meek
Joyce A. Verran

REMINISCENCE

Butler (1963) described reminiscence and life review as naturally occurring universal processes characterized by the progressive return to consciousness of past experiences and unresolved conflicts. Today reminiscence serves as an umbrella term under which all forms of recalling the past are subsumed and particular ways of remembering are often referred to as reminiscence work. Life review is a particular form of reminiscence work and differs from other forms of reminiscing in that it is more structured, deliberate, and evaluative. Nurses use reminiscence work for a variety of purposes: to promote enjoyment, to encourage communication, to learn about their clients, to further well-being and to help their clients come to term with their lives. Though most reminiscence procedures are verbal, they can also be written as in guided autobiography, or silent, within oneself. The goal of using reminiscence in a purposeful way for therapeutic means differentiates therapeutic ways of recall from others such as oral history where the purpose is to hear a life story for history's sake rather than to hear the story to benefit the individual telling the story.

Reminiscence work was first recognized and described by Butler (1963) in a seminal article that caused other health care providers to look more closely at the phenomena of reminiscence, particularly in older people. Since Butler, many articles have been written by clinicians who happened on reminiscence quite by chance and thus wanted to share their experiences and techniques with others. Though interesting, these first manuscripts did not demonstrate knowledge of the literature or awareness of the work that was going on around them, giving the manuscripts less impact than they would have had as informed reports. Nurses who have used life review and reminiscence can understand this situation because often, when they used reminiscence themselves, they were impressed with the outcomes and improvement in their clients and wanted to share their new knowledge with others.

The early research was often poorly designed. Very few studies had a theoretical basis. Authors that published clinical reports often did not describe their interventions fully so that the reader was not sure what was responsible for what outcomes. One study might examine a 1-hour reminiscence session, whereas another might look at a 6-week approach to remembering the past and then try to compare them as the same intervention. The interventions were often carried out singly or in groups without differentiating one from another. The outcome measures were often unsophisticated and had little reliability and validity, again making it hard to compare one outcome with another. It was also said that recalling the past might cause depression, making many clinicians and researchers wary of using reminiscence as a therapeutic tool and also making it difficult to get a reminiscence study approved by an institutional review board. As a matter of fact, one board refused to approve such a study for a graduate nursing student stating she was not as skilled as a psychiatrist.

The lack of pertinent theories has also affected the work in life review. But as other disciplines became involved in reminiscence work, most notably psychology and social work, there have been definitive gains in the growth and sophistication of the research. For example, many researchers see a relationship between therapeutic recall and the writings of Erickson (1950) and so have used Erikson's work as a theoretical frame. They see life review, particularly, as a means of achieving Erikson's eighth stage of integrity. For nurses, Martha Rogers can provide a framework. The important thing is that theory is beginning to guide the research.

Over time, researchers began to define and describe their interventions so others could replicate their work. To bring some clarity to the field, Webster (2003) created a reminiscence function scale to describe ways of reminiscing. Presently there is a great deal of interest in how these reminiscence functions work within the person and in how they become therapeutic. A group from the Netherlands has conducted studies looking at the intervention of reminiscence as a search for new meaning in life. They have gone on to publish even more work, describing their intervention clearly and differentiating it from others, making the process of replication clearer and easier for those who follow. Their greatest contribution is a meta-analysis of the effects of reminiscence on psychological well-being and depression in older people (Bohlmeijer, Roemer, Cuijpers, & Smit, 2007). We are at a point where we can say that a certain type of reminiscence is effective in reducing depression and we are closer to figuring out how the positive effect happens.

Although the research concerning reminiscence and life review is still in its adolescence, not in its infancy, nurse clinicians continue to encounter reminiscence by chance and adopt it as an intervention, without benefit of knowing the research and what has gone before. Encountering the joys of reminiscence is often an "aha" moment for nursing clinicians, and thus they continue to publish stories of their surprising success with reminiscence and with their clients because it is a discovery they wish to share. Thus, the nursing work in reminiscence this past decade is a mixture of research and clinical reporting that essentially falls into four categories: education, dementia, end of life, and psychological well-being. Nurses use a variety of methodologies to include both quantitative and qualitative methods, case studies, and clinical reports. Nursing research would improve in this area if more editors refused publications that do not include at least some of the research basis in this field. Nursing knowledge should really be beyond publishing what an individual nurse believes to be a new discovery rather than a work based on a previous database and the extant literature.

Nurses have discovered that reminiscence can be an effective tool for educating their students. One educator used a reminiscence education program to help students appreciate other cultures, thus preparing more caring and knowledgeable students. While doing this, Shellman (2006) created a tool to examine student nurse's confidence in caring for ethnically diverse elders. She used a large sample of 248 students from seven schools of nursing. Principal factor analysis revealed a four-factor structure accounting for 61% of the variance that provided a useful tool for nurse educators. Shellman (2007) then reported on the effectiveness of the tool used with her students after they participated in an integrative reminiscence program with older people during their community health practicum. Those that received the reminiscence program were significantly higher in cultural self-efficacy than those who did not. There is more in the literature about nursing educators using life review and reminiscence than there was prior to this decade, but most of what is there is still observational reporting. However Shellman's (2007) work in creating a tool to examine nursing student's attitudes was well done with a large enough sample size and good analyses. I encourage other nurses to use and reaffirm the tool when they wish to look at and use reminiscence with their nursing students.

Caring and communicating with patients who have dementia has been an important area of interest for nurses over the last decade. Reminiscing and life review have been tested as tools and interventions for reaching such patients. Lai, Chi, and Kayser-Jones (2004) conducted a randomized controlled trial to see if a specific reminiscence program led to higher levels of psychosocial well-being in nursing home residents who have dementia. They found a significant improvement in well-being for those in the intervention group. Moos and Bjorn (2006) reviewed 28 intervention studies using the life story as intervention for nursing home residents with dementia but reported that the studies were too diverse in methodologies to be able to make a positive blanket statement regarding their efficacy. They recommended more rigorous designs that measured a few precociously defined quantitative outcomes. Recently, Haight, Gibson, and Michele (2006) conducted a study in Northern Ireland using a structured form of life review with people who have dementia living in care settings. A multivariate analysis of covariance determined significant change by group, particularly on depression ($p = .015$), communication ($p = .005$), and cognition ($p = .0005$).

End-of-life care provides a natural laboratory for testing reminiscence and life review. Using life review is almost a natural segue for people who are dying when they wish to put the past in order before they leave their present life. When life review is used in terminal care, it must be suited to the needs of the patient who may be very weak and tired. Time for the sessions can be shorter, and the sessions themselves can be more frequent while the dying person still has strength. Often at this stage of life, the dying patient will initiate the life review themselves and the nurse just needs to tap into the ongoing dialogue. Ando (2003) used a shortened life review of only 1 week with 68 terminally ill cancer patients after testing both short- and long-term life review with young adults and found that they both promoted young adults' immediate psychological well-being. With terminally ill cancer patients, a short-term life review was effective in improving spiritual well-being and promoting a good death (Ando, Morita, Akechi, & Okamoto, 2010). Ando's research is thoughtful and builds on itself supporting the use of a shortened life review with terminally ill patients in Japan. Jenko, Gonzalez, and Alley (2010) added to the literature in this area by describing the use of life review in a critical care setting. They saw life review as having a distinct purpose in end-of-life care by upholding the value of the person no matter the shortness of the time left to the individual. They encouraged the use of life review as an integral part of clinical practice but added no further research.

Finally, the bulk of nursing research in this area focuses on improving well-being, particularly depression, in older people. Wang, Hsu, and Cheng (2005) conducted a longitudinal study with two equivalent groups and 94 subjects. The experimental group showed a statistically significant difference on depression from pretest to posttest after a 4-month intervention of reminiscing. Another group of nurse researchers conducted a qualitative study looking at the feasibility of nurses delivering the intervention of life review to home-dwelling older women and found that a 3-hour intervention was a cost-effective method for enhancing mood in these women at home (Symes et al., 2007). Gunther (2008) described a phenomenological study on deferred empathy and discovered that the process of reflecting on the past resulted in an understanding of others as well as an understanding of one's self and therefore a greater acceptance of one's self, suggesting an important use in helping people adjust to their circumstances. In a randomized controlled trial, Hanaoka and Okamura (2004) looked at the effect of life review activities on the quality of life in 80 older persons. Repeated measures showed direct effects on scores of depression and hopelessness 3 months after completing a group life review intervention.

In summary, there has been growth in nursing research on reminiscence work. Now, 10 years later, the research is clearer, the definitions made, more work is replicated, and the field is moving ahead with more authority and organization. Nonetheless, one notices a greater acceptance of reminiscence work in foreign countries and related disciplines than those in the United States and in nursing. Researchers in the Netherlands, Canada, China, and Japan have been far more active in their research pursuits and are producing more definitive studies. Perhaps this is because alternative interventions are more accepted in foreign countries or because Americans are more focused on interventions that are billable in the U.S. health care system.

One ongoing problem for everyone is that reminiscing is a soft intervention and the outcomes are measured by paper and pencil. To really prove its worth as a mental health intervention, physical measurements are called for. We should be using MRIs to observe the brain while reminiscing. We should be testing changes in the immune function and generally examining body chemistry as a direct result of what we are doing. When those studies are done, we can then accept the intervention more fully. Because nursing has been in the forefront of qualitative research for many years, nurses should apply their expertise to the stories that are a product of reminiscing. Reminiscence work provides much data for qualitative studies in understanding various phenomena and for understanding individual people and their issues. Lastly, researchers need to increase their sample sizes to provide enough power to make the work relevant to health care. To do this, more funding is needed because the interventions are time consuming, and therefore, research is costly.

Barbara K. Haight

REPLICATION STUDIES

Replication involves repeating or reproducing a research study to investigate whether similar findings will be obtained in different settings and with different samples. Replication is needed not only to establish the credibility of research findings but also to extend generalizability. Blomquist (1986) listed five reasons replication studies should be encouraged in nursing: (a) scientific merit is established, (b) Type I and Type II errors are decreased, (c) construct validity is increased, (d) support for theory development is provided, and (e) acceptance of erroneous results is prevented. Replication studies are essential for developing a scientific knowledge base in nursing. Incorporating research findings into nursing practice has been seriously hampered by the limited number of replication studies. Clarification of replication terminology can assist in advancing replication research.

There are three methods of replication: literal, operational, and constructive. Literal replication is an exact duplication of the original researcher's sampling, procedure, experimental treatment, data collection techniques, and data analysis. Operational replication involves an exact duplication of only the sampling and experimental procedures in the original research to check whether the original design when used by another leads to the same results. In constructive replication, duplicate methods are purposely avoided.

Four replication strategies have been described: identical, virtual, systematic, and pseudo. Identical replication involves a one-to-one duplication of the original study's procedures and conditions. In virtual replication, the methods of the original study are recreated in varying degrees. In systematic replication, neither the methods nor the substance of the original study are duplicated. Pseudoreplication is similar to identical and virtual replication; however, data for pseudoreplication are collected at the same time as those for the original study. The simultaneous confirmation of the study is built into the original design.

Types of replication include retest, internal, independent, and theoretical replication. Retest replication involves repeating an original study with few, if any, significant changes in the research design. Internal replication is incorporated into the original study. Data for both the original study and its replicated study are collected simultaneously to provide a cross-check for the reliability of the original results. In independent replication, significant modifications in the design of the original study are made to verify the empirical generalization. In theoretical replication, the inductive process is used to examine the feasibility of fitting the empirical findings into a general theoretical framework. The purpose of choosing this type of replication is to determine if the original findings can be confirmed when modest changes in the research conditions have been made. When original findings are replicated, confidence in the reliability of these results is enhanced. All classifications include an approach to increase empirical generalization by significantly modifying the original design.

Replication studies conducted in nursing have addressed topics such as nursing education, nurses' characteristics, perioperative nursing, body image during pregnancy, cardiac care, fetal monitoring, and time perception. When publishing replicated studies, nurse researchers should include the following information: (a) identification of the specific type of replication that is conducted, (b) provision of specific information on how a replicated study is the same as and different from the original study, and (c) explanation of what is replicated and how. This information will help readers to more clearly understand how the researchers methodically revised previous studies in a progressive manner. When publishing original studies, researchers also should explicitly detail the important points of their sampling and data collection techniques and their research design to aid replication of their work. Authors must be more diligent in identifying the minimum essential conditions and controls necessary for producing findings because replication is crucial for the further development of nursing knowledge.

Cheryl Tatano Beck

RESEARCH DISSEMINATION

Research dissemination is the purposeful communication of research, particularly, the findings and implications of those findings to members of society who can utilize them. Dissemination is sometimes differentiated from diffusion when the latter term is reserved for spontaneous spread and use of research. Most writers on dissemination and diffusion talk about a purposeful process aimed at spread and use of research. Utilization is another related term. Utilization is specifically focused on application and is more likely to be initiated at the user end, whereas dissemination is focused on knowledge acquisition and more likely is initiated at the researcher end. The two are obviously linked with overlapping phases in their processes. A principal writer/researcher whose work has directed research dissemination is Rogers, who wrote on the “diffusion of innovations.” Rogers (1995) noted that in 1962, at the time of his first book, 405 publications were found on innovation diffusion, whereas by 1995, the number approached 4,000. Recently, dissemination/diffusion is seen as a less linear process where the potential users of research have a responsibility to contribute to the dialogue so that the movement from innovation to application can occur (Rogers, 1995).

Explicit dissemination occurs as researchers present their findings, implications, and recommendations in articles, papers, and posters. Usually, these communications include details of the research process that facilitates a scholarly critique. The criticism is that too often these communications occur between researchers and that the nurse caregiver is not linked into the research communication networks. Fortunately, some practitioners do attend research conferences, and some practice-focused conferences devote programming to research.

A model for dissemination reported by Funk, Tornquist, and Champagne (1989) included practice-oriented research conferences, edited (specifically for practice) monographs of presentations, and an information center. The evaluation of the conference found the general responses extremely positive, but still major communication problems existed in both oral and written reporting. These problems persisted even with a great deal of support to the research communicators. This communication deficit leaves a practitioner, who is unsure, responsible for deciding about practice utility (persuasion). Because the “old way” is usually comfortable, the innovation may not move from knowledge awareness to the more advanced how-to or principles knowledge. Consequently, the nurse prepared at the graduate level has an important role in dissemination in a clinical agency. This nurse is usually the reader of research, can interpret the findings, and sees the application possibilities. Through means like continuing education and journal clubs, the nurse from a graduate program can assist in filtering the research literature to match closely the practicing nurses’ concerns and interests.

Implicit dissemination also occurs. This dissemination occurs when educators (academe, staff development, and continuing education) incorporate relevant research into their offerings. Audiences frequently trust that presenters have carefully critiqued the research they cite. Although this assumption usually is well founded, the scholarly practitioner will seek references and do a personal review.

As more nurses are university educated, including nurse administrators, familiarity with the relevant research has become a standard of practice in some organizations. Although this practice is not yet the norm, practice policies, standards, and procedures should be written, with a literature review that includes applicable research from nursing and other relevant disciplines. With a policy or procedure focusing on the "need to know" for the practitioner, the review of relevant research can be productive in practical dissemination by providing a context for considering whether to move into the application/utilization phases of knowledge diffusion.

An additional means of dissemination is currently evolving, and that is via the Internet. Universities, professional organizations, and individuals have home pages that more and more are including research information. Online journals also are available. Some of the home pages include only researcher names and topics; others include abstracts and findings.

Patricia A. Martin

RESEARCH IN NURSING ETHICS

Ethics in nursing research, also referred to as scientific integrity, is concerned with the principles and practices of good science that aim to promote the generation of sound and ethically defensible knowledge. The principles are developed within the framework of the scientific community and derived from the field of ethics, a branch of philosophy. A number of practices are subsumed under this general heading; together, they address the duties and obligations of scientists toward science and society, fellow scientists, and their students.

Many codes of ethics state or imply that nurses have a responsibility to conduct research to expand the profession's knowledge base; yet, few provide guidance on the ethics of research. An increasing number of nursing organizations are now turning their attention to this very task to provide specific guidance to their members on sound practices in their research and for the training of the new generation of nurse researchers (Ketefian, 2010).

Until recently, many nurse scientists had a limited conception of ethical conduct in science, identifying human subject protection as the main concern in their practices and in the instruction of their students. Further, they displayed a lack of consensus on research and publication practices and in their views on the roles of professional organizations, institutions sponsoring research, journal editors, among other important matters (Lenz & Ketefian, 1995; Ketefian & Lenz, 1995). A major change has come about more recently, perhaps occasioned by heightened public awareness of scientific misconduct by a few scientists. Government funding agencies, institutions, and professional organizations alike have recognized the need for greater rigor, and guidelines and policies have been put in place.

Why do we want science to be ethical? Several reasons can be cited: to serve the public good and promote public trust in science, we want to have confidence in the validity of knowledge; to demonstrate good stewardship of public funds; and last, because it is the right thing to do. Several ethical principles underlying science aim to assure that science and scholarly knowledge are accurate and valid, and they protect intellectual property rights of all concerned (Midwest Nursing Research Society [MNRS], 2002).

Research is considered ethical when it has scientific value; has scientific validity, that is, it is soundly conceived and designed; incorporates fair treatment and selection of subjects; has favorable risk–benefit ratio; protects the rights, dignity, autonomy, privacy, and confidentiality of research participants; has undergone independent review, such as by an institutional review board; incorporates the voluntary and informed consent of subjects; and protects subjects from harm (Burns & Grove, 2005).

Several ethical principles undergird integrity in science. *Autonomy* refers to freedom and capacity for intentional action and self-governance. The concepts of *privacy*, *confidentiality*, and *giving voluntary informed consent* are based on this principle. *Nonmaleficence and beneficence* together refer to three hierarchically arranged edicts: we ought to prevent harm, we ought to remove harm, and we ought to promote good. Protecting research subjects from harm and weighing the risks and benefits of a study reflect these principles. *Justice*, in this context, refers to the notion of fairness, equitableness, and appropriateness, with respect to how benefits and resources are distributed. In research, considering the question of who will benefit from research and how the risks and benefits are to be weighed refers to this principle.

The most frequently used scientific integrity guidelines by nurse scientists are those promulgated by the MNRS (2002). The topics covered in that document, along with the guidance provided, are briefly presented below.

The principal investigator has overall responsibility for the project, while research teams participate in developing procedures regarding data collection, storage, use, and access. Data belong to the institution in the case of a grant and to the funding agency in the case of a contract. Team members have access to the data and assume responsibility for safeguarding it and for preserving subject confidentiality; steps are taken to assure data of high quality; data are reported accurately, avoiding intentional withholding or selective reporting. Data are kept for periods of 5–7 years. Results are shared with qualified scientists, typically following publication (MNRS, 2002).

Publication practices include authorship, peer review, and journal editor responsibilities. *Authors* are those who contribute substantively to the work and can assume public responsibility and can defend it publicly. Substantive contribution involves two or more of the following: conception and design, execution of the study, analysis and interpretation of data, and preparation and revision of manuscripts. Teams should discuss and determine, in advance, responsibilities of members in the research, authorship, and ordering of authors. *Peer reviewers* use the best known standards in the field in their reviews, maintain confidentiality, avoid conflict of interest, and provide constructive and collegial comments. *Journal editors* frame policies that assure high-quality reviews and provide prompt and fair feedback to authors; they have the responsibility for determining which manuscripts, letters, corrections, or retractions are published (MNRS, 2002).

Open access publication is a recent phenomenon facilitated by the Internet, and it might take several forms. In *self-archiving*, individual scientists post their work online prior to publication. As this is done prior to peer review, revision, and editing, an article is likely to undergo many revisions before it is published. Thus, the use of such material in its early form can be misleading. *Open-access publishing* is when journals make all or parts of a journal available (JAMA and Archives Journals, 2007, p. 184). Those who access and use such material need to be meticulous in referencing authorship, its source, publisher, and especially the Web site and exact date when it was accessed so readers can be aware of which version they are reading.

Several features which some guidelines do not specifically discuss, perhaps assuming that they have become fundamental in science and our educational process for novices, pertain to *protection of the rights of human subjects*, including protection from harm.

As there are strict government guidelines regarding this matter, institutions are careful to enforce these. Another such area pertains to the need for *attribution* when either ideas or words from others are used, either by paraphrasing or by quoting.

It is important to note that within the United States we assume many of the above principles and practices to be universal; yet, this is not the case. In reality, there are many variations across nations and cultures with regard to these matters. Thus, we need to be especially mindful of the training our international students may have received in their education prior to coming to the United States. Careful attention to the socialization and mentoring of this group of students is merited.

Truthfulness and honesty are basic tenets in science. Scientific knowledge is a cumulative process to which generations of scientists contribute insights over time. A quote attributed to Sir Isaac Newton expresses this best: "If I have seen further, it is by standing upon the shoulders of giants."

Shaké Ketefian

RESEARCH INTERVIEWS (QUALITATIVE)

The interview is a major data collection strategy in qualitative research that aims to obtain textual, qualitative data reflecting the personal perspective of the interviewee. The interview creates an interactional situation in a face-to-face encounter between researchers and participants. In the study, the interviewer acts as the instrument and through carefully designed questions, attempts to elicit the other person's opinions, attitudes, or knowledge about a given topic. Research interviews have historically provided the foundation for sociological and anthropological studies that attempted to understand other societies and cultures. As nurse scientists were trained in these methods in the late 1960s and the 1970s, they began using research interviews in nursing studies. Some researchers who seek quantitative data from questionnaires may refer to the structured, standardized survey that is administered face-to-face to large groups of people. The present definition, however, refers to the in-depth and generally less structured interview used in qualitative research.

The research method (e.g., grounded theory, phenomenology, and ethnography) suggests the style and purpose of the interview questions. The research objectives are fundamental to the interview questions to maintain the integrity of the research. Grounded theory research intended to discover contexts, phases, and processes of a given phenomenon requires questions designed to acquire knowledge, such as, what is the context of death in a nursing home or at home or what are the phases of dying? Phenomenological research that aims to capture what is referred to as "the lived experience" may use only one general question: Please tell me all that you can about dying. Ethnographic research that is focused on culture may ask about which family members are involved in decisions concerning death and what their roles are.

Interviews are structured in phases—the introduction, the working phase, and termination. In the introduction, the researcher gives a personal introduction, states the anticipated length of time of the interview, and makes some initial comments to relax the participant and to assist with the transition from social conversation to research interview. In the working phase, the themes of the research are introduced, and the researcher and participant work toward generating a shared understanding. In the termination phase, the interview draws to a close, and often, brief social conversation occurs again.

The interview demands careful thought about the nature, wording, and sequence of questions. Generally, questions move from general to specific, becoming more focused as themes emerge and as data from other participants suggest additional leads. Questions should be unambiguous, meaningful, and successful in involving the interviewee in the process. The participants in the research are often helpful in critiquing the usefulness and appropriateness of the questions and suggesting others that may be more relevant or successful in obtaining the desired data.

Interviews are of two types: formal and informal. Formal interviews are scheduled as to time and place and generally occur over a period of 1 to 2 hours. Informal interviews are those used in participant observation, when the interviewer spends time in a specific environment and interviews participants as they appear on the scene or around a significant event. Although effective interviews, especially informal ones, may appear simple and comfortable, an expert interviewer is always both in and out of the interview. The interviewer listens carefully to the interviewee and anticipates how to direct the interview to accomplish the aims of the research.

Interviews are characterized as structured and focused when all questions are given in the same order to participants. Interviews in qualitative research studies are generally semifocused ones in which information about a certain subject is desired from all participants, but the phrasing and sequence of the questions may be varied to reflect the characteristics of the participants in the context. Time is permitted to encourage participants to introduce other subjects that they believe are relevant and to elaborate, often with the help of the interviewer's probes, on earlier comments. Participants' interpretations of meanings and definitions are valued. Such information is obtained only through open-ended questions and free-flowing conversation that follow the thinking of the interviewee. In a sense, the interviewee teaches the researcher about a particular experience or event.

Interviews are generally tape-recorded, and the researcher takes handwritten notes that jog his or her memory during the interview to return to a topic, to ask a hypothetical question, or to request new, related information. These taped interviews are transcribed as soon as possible by the researcher or a transcriptionist and cross-checked against the audiotape for accuracy.

Interviewing establishes the foundation for data analysis. The researcher's interview questions and responses to the interviewee must be analyzed in a reflexive manner to ascertain the quality of the interview. Is the interviewer cutting off the interviewee? Is the interviewer asking closed instead of open-ended questions? Is the interviewer asking relevant questions in a sensitive way? Is the interviewer giving the interviewee time to reflect and to complete his or her comments? Unfocused, insensitive interviewing yields poor data. Quality data result from the expression of affective responses and detailed personal information.

The complexity of interviewing becomes apparent in varied contexts. Interviewing individuals from a culture different from that of the interviewer presents other issues; likewise, interviewing the extremely poor or the extremely rich has its own sets of problems. In the past, nurses have relied on sociological and anthropological researchers for guidance. Nurse methodologists agree that it is now time to identify and address issues in interviewing that are especially relevant to nursing topics and populations.

Good interviews provide access to the heart. Such personal information, essential to qualitative research that aims to access human meaning, is a gift. The researcher reciprocates by listening carefully and attempting to render or interpret the experience of the other as accurately as possible. An insensitive interviewer can harm the interviewee, leaving the person psychologically depleted or even wounded. Good interviewers leave interviewees feeling that they gained from the interview.

Sally A. Hutchinson
Holly Skodol Wilson

RESEARCH UTILIZATION

Research utilization is a process in which knowledge generated from research is translated into practice. It is a term that was used before the introduction of the term evidence-based practice. The goals of research utilization and evidence-based practice are the same: improving patient care and advancing the discipline of nursing. The importance of using research findings in clinical practice has been discussed for at least 45 years. The first research utilization models were developed in the 1970s, beginning with the Western Interstate Commission for Higher Education in Nursing (WCHEN) Regional Program for Nursing Research Development (Krueger, 1978). Other models included the Conduct and Utilization of Research in Nursing (CURN) project (Horsley, Crane, Crabtree, & Wood, 1983), the Stetler/Marram model (Stetler, 1994), the Iowa model of research in practice (Titler et al., 1994), and the Retrieval and Application of Research in Nursing (RARIN) model (Bostrom & Wise, 1994). This list is not exhaustive; rather, it is a representation of several well-known and referenced models found in the literature.

The WCHEN model was focused on cross-organizational planning and enhancing the value for research utilization. Nurses from a variety of clinical agencies were provided with 3 days of research training. Each clinician would identify a clinical problem, review the research in that area, and develop a plan for implementing and evaluating the outcomes of the practice change. The annual Communicating Nursing Research conferences also resulted from the initial WCHEN work group, with emphasis on dissemination of research results across academic and nursing service settings. There have been 30 conferences prior to 1997.

The CURN project was a federally funded initiative that focused on the use of a team approach for reviewing research results related to specific patient care problems, developing clinical protocols, and then testing the protocol in an acute care clinical setting. A key component of research utilization in this model was the replication of previous studies. The focus of the Iowa model was similar to that of the CURN project, with particular attention to developing support for research utilization strategies at the organizational level. Both models were developed specifically to bridge the gap between research and practice. Both recommended that organizational resources, such as personnel, equipment, time, and money, be available to support the nursing staff. Policy, procedures, committee structures, and role expectations must exist in relation to staff involvement in research utilization activities. Both models also supported a fundamental belief that research can and must be applied to practice if patient care is to improve.

The Stetler/Marram model was developed primarily for use at the individual level and specifically outlined the role clinical specialists have in facilitating the application of research findings to clinical practice. The model includes specific steps related to the need for a sound foundation in the conduct of research, and what is more important, it demonstrates how to interpret and validate findings that can be used to change the practice.

The RARIN model, funded by a National Library of Medicine grant, was developed at Stanford University Hospital in Palo Alto, CA. Distinct from the other models, which focused on providing nurse education, skill building, and organization support strategies, the RARIN model focused on improving staff access to research findings through the use of computerized linkages to established research databases. Training a small set of nurses from each unit on the use of the computer network and the basics of the research critique was the other major component. The computer technology provided direct access to the MEDLINE citation system (including CINAHL) as well as databases of research abstracts that were written by experts. Hence, nurses could access almost any database via the use of the developed tools and technologies while working in a patient care unit. The model assumption was based on a belief that if access to research findings was improved and the findings were represented in an easily understood, yet clinically sound framework, then practicing nurses would be able to improve patient care.

Outcome results from these and other models have been limited. Numerous barriers to transferring research-based knowledge into nursing practice persist. Staff nurses reported the following as barriers to research utilization: (a) insufficient skills and knowledge about evaluating research, (b) lack of awareness or access to research, (c) minimal value of research for practice, (d) insufficient authority to actually change practice, (e) insufficient time to read research and to learn research skills and how to implement changes when necessary, (f) lack of cooperation and support from administration and other staff, (g) little personal benefit, (h) unclear and unhelpful statistical representation of results, (i) few replication studies to determine if sufficient evidence exists to change practice, and (j) lack of access to databases and research literature. Nurse administrators also reported barriers, such as (a) isolation from research colleagues, (b) lack of time because of heavy workloads, (c) difficulty in reading and interpreting research findings and statistics, (d) insufficient skills in research critique, (e) lack of replication studies to determine if practice requires change, and (f) lack of access to databases and research literature.

Facilitators for the research utilization process have also been identified. They include (a) creating practice environments that require research-based clinical standards, (b) providing expert consultation and activities such as research committees to increase the adequacy of research skills, (c) improving access to computerized databases and research literature, (d) allotting time and money to support conference attendance and participation, (e) developing performance standards that include behavioral expectations to support research-based practice, and (f) obtaining grants to support research projects.

The literature related to research utilization is almost exclusively focused on nursing practice environments, with little attention to how research utilization is introduced into the nursing curricula at all levels. Research utilization is a critical professional accountability issue to resolve if the discipline of nursing is to advance. Therefore, it is essential for nursing educators to socialize students at all levels to the value of research utilization and to model the required skills. For example, most teaching about the research process at the baccalaureate level is isolated from discussions about actual caregiving and how that care might be improved by applying research findings. Graduate students are not adequately prepared for the integration of research into the care of specific patient populations and have little preparation in areas of quality improvement and outcomes-evaluation methodologies. Doctoral education continues to be focused on the conduct of research, with minimal emphasis on how to report results in ways that are understandable to practicing clinicians. Although learning a thesis format of writing is important, it is equally important to learn how to convert research jargon into useful, specific, and direct reports for clinicians. In addition, more value and attention should be given to replication research that would advance results that are more generalizable and easily applied to clinical practice.

The health care environment is changing rapidly, with increased attention to outcomes-based practice, evaluating patient outcomes, and demonstrating cost-efficiency and effectiveness. Technology is now available to provide much access to research and relevant databases; however, there is still need for timely and readable reports of completed research.

Carol A. Ashton

RESOURCEFULNESS

Resourcefulness is a collection of cognitive and behavioral skills that are used to attain, maintain, or regain health. Resourcefulness involves the ability to maintain independence in daily tasks despite potentially adverse situations (i.e., personal resourcefulness; Rosenbaum, 1990) and to seek help from others when unable to function independently (i.e., social resourcefulness; Nadler, 1990). Thus, two forms of resourcefulness exist, and the skills comprising the two are complementary and equally important for health promotion (Zauszniewski, Lai, & Tithiphontumrong, 2006). Both the self-help and help-seeking skills constituting personal and social resourcefulness, respectively, are believed to be learned through either formal or informal instruction (Rosenbaum, 1990) and can therefore be taught (Zauszniewski, Bekhet, Lai, McDonald, & Musil, 2007). Numerous studies since the early 1980s have suggested that teaching personal and social resourcefulness skills is beneficial in promoting and maintaining healthy physical, psychological, and social functioning across the life span.

Over nearly three decades, theoretical notions about resourcefulness have been developed whereas numerous studies of resourcefulness have been conducted. Resourcefulness research has expanded from healthy college students, to adults with various psychological and physical conditions, to community-dwelling and chronically ill elders. In addition, research methods used in studies of resourcefulness have evolved from standard psychometric studies to designs that characterize individuals with high or low resourcefulness and investigation of predictive models, to testing of interventions that teach resourcefulness to elders. However, studies of resourcefulness in children and adolescents remain few and many opportunities exist in this area.

The synthesis of theoretical notions and empirical findings has facilitated the creation of a middle range theory of resourcefulness (Zauszniewski, 2006) for nursing and health care research. This theory of resourcefulness is based on the conceptualization of the two forms of resourcefulness: personal (self-help) and social (help-seeking) resourcefulness. Other major constructs of the theory of resourcefulness include antecedents or contextual factors (intrinsic and extrinsic), intervening variables or process regulators (i.e., perceptions, cognitions, affect, and motivation), and quality of life outcomes (i.e., physical, psychological, and social functioning).

Contextual factors affecting resourcefulness are both intrinsic and extrinsic. Intrinsic factors that have been identified from empirical research include demographic characteristics (e.g., age, gender, and race/ethnicity), chronic conditions or health status (Huang, Perng, Chen, & Lai, 2008; Huang et al., 2007; Huang, Sousa, Tu, & Hwang, 2005; Zauszniewski, Bekhet, & Suresky, 2009; Zauszniewski & Chung, 2001; Zauszniewski, Chung, & Krafcik, 2001; Zauszniewski, Eggenschwiler, Preechawong, Roberts, & Morris, 2006; Zauszniewski et al., 2005), and perceived caregiver burden (Musil, Warner, Zauszniewski, Wykle, & Standing, 2009; Wang, Rong, Chen, Wei, & Lin, 2007; Zauszniewski, Bekhet, & Suresky, 2008; Zauszniewski et al., 2005). Extrinsic factors include social network size, social support, and environmental/milieu characteristics (Bekhet, Zauszniewski, & Wykle, 2008; Dirksen, 2000; Huang & Guo, 2009; Kreulen & Braden, 2004; Ngai, Chan, & Ip, 2010; Zauszniewski et al., 2005).

Depressive cognitions and negative emotions associated with lower personal and social resourcefulness have been found in elders with chronic conditions (Zauszniewski et al., 2007) and family members of persons with serious mental illness (Zauszniewski et al., 2009). Self-esteem has also been reported to be significantly associated with personal resourcefulness and well-being in women survivors of breast cancer (Dirksen, 2000; Dirksen & Erickson, 2002). Health self-determinism was found to be a significant predictor of personal and social resourcefulness in chronically ill elders (Zauszniewski et al., 2001). Studies have also identified uncertainty as an antecedent of personal resourcefulness (Dirksen, 2000; Dirksen & Erickson, 2002; Kreulen & Braden, 2004). The specific roles played by various process regulators, including cognition, affect, perception, and motivation, in affecting personal and social resourcefulness need examination that is more systematic.

Positive health outcomes of personal and social resourcefulness have been well-documented through empirical research. These outcomes, including adaptive functioning in school-aged children (Chang, Zauszniewski, Heinzer, Musil, & Tsai, 2007), adjustment to relocation in elders (Bekhet et al., 2008), maternal role competence and satisfaction in first-time pregnant women (Ngai et al., 2010), perceived health in diabetic women (Zauszniewski et al., 2001), psychological well-being in women survivors of breast cancer (Dirksen, 2000; Huang et al., 2010) and in elders (Zauszniewski et al., 2001), health practices in women with type 2 diabetes (Zauszniewski & Chung, 2001), prenatal self-care of pregnant women with HIV (Boonpongmanee, Zauszniewski, & Morris, 2003), and mental health of family members of adults with mental illness (Zauszniewski et al., 2009) fall under the "umbrella" concept called quality of life.

Personal resourcefulness, also termed learned resourcefulness, has been measured using Rosenbaum's (1990) 36-item Self-Control Schedule in which respondents indicate the degree to which each item describes their behavior, ranging from extremely descriptive to extremely nondescriptive. Internal consistency estimates have ranged from .78 to .85 in adults, including elders (Rosenbaum, 1990). The SCS is moderately correlated with locus of control, religious orientation, anxiety, and depressive symptoms, supporting its construct validity (Rosenbaum, 1990). A 20-item Social Resourcefulness Scale was developed by Rapp, Schumaker, Schmidt, Naughton, and Anderson (1998). Respondents indicate the frequency of use of behaviors to obtain and maintain help from others, ranging from never to always. Acceptable internal consistency has been reported and construct validity was supported by significant correlations with social support and self-control (Rapp et al., 1998).

Although these reliable and valid individual measures of personal and social resourcefulness exist, Zauszniewski, Lai, et al. (2006) developed the 28-item Resourcefulness Scale, which contains items reflecting both personal and social resourcefulness. The Resourcefulness Scale has acceptable internal consistency ($\alpha = .85$) and two correlated subscales reflecting personal and social resourcefulness ($r = .41$) were confirmed through factor analysis (Zauszniewski, Lai, et al., 2006).

Fostering the development and maintenance of both personal and social resourcefulness is well within the purview of nursing interventions. Clinical trials are currently examining various methods for teaching personal and social resourcefulness skills to elders with chronic conditions, grandmothers raising grandchildren, caregivers of elders with dementia, and family members of persons with mental illness. Additional research with children, adolescents, and ethnically diverse populations is needed.

Jaclene A. Zauszniewski

RIGHTS OF HUMAN SUBJECTS

Rights are just claims that are due to someone. Legal rights are valid claims recognized by a legal system. Moral rights are valid claims derived from customs, traditions, or ideals which may be upheld or protected by the law. Human rights are valid claims that are due to members of the human species and may be legal, moral, or both.

The rights of human subjects in research include the right to informed consent, the right to privacy, the right to refuse to participate in research, and the right to withdraw from a research study, without penalty, at any time. These four rights are all derived from a general right to liberty and are both moral and legal. They are supported by moral principles of the social community, professional codes of research ethics, and by legal protections. They become relevant in nursing research because all nurses have a responsibility to protect, and sometimes defend, the basic rights of patients within the health care system. When the nurse is also a researcher, the nurse has the added responsibility to make sure that these particular rights are not violated by the research process.

Informed consent is a process that protects research subjects' autonomy, protects research subjects from harm, and assists the researcher to avoid fraud and coercion in the role of researcher. It is also a process that encourages researcher responsibility for how information is communicated in research, promotes rational decision making by human subjects, and involves the public in promoting self-determination as a social value. Informed consent has information elements and consent elements.

For adequate disclosure of information, the research subject must be informed of the procedures to be used throughout the study. Information about available alternative treatment procedures, a discussion of risks and benefits of these procedures, and the opportunity for questions about or withdrawal from the project after treatment has begun, should all be provided to the research subject.

For adequate comprehension of information, the research subject must have time to consider the information and to ask questions. This means that when the ability to comprehend information is limited (such as when a subject's mental competence is limited), the researcher must allow the research subject additional opportunity to consider whether or not to participate in the study.

Voluntary consent to participate in research means that the research subject has exercised choice, free of coercion and other forms of controlling influence by other persons. A research subject's consent is valid only if it is voluntarily given. Voluntariness protects the patient's right to choose goals and to choose among several goals when offered options. However, consent cannot be given unless the research subject is "competent," or can make decisions based on rational reasons. Both competence and voluntariness are required for a subject's consent to be truly informed.

Nursing research on the informed consent of human subjects has focused on the comprehension of information by research subjects, subjects' competency for informed consent (i.e., adolescents and mentally retarded minors), and the factors that influence the informed consent of adolescents and adults. The study designs have been exploratory and quasi-experimental and have included relatively small sample sizes.

The right to privacy includes the right to keep personal information about oneself private, undisclosed, and away from public scrutiny. It also includes the right to bodily integrity, or freedom from unwanted intrusions on body parts. One way that the research subject's right to privacy is protected is by following rules of confidentiality. For example, information about the research subject may not be disclosed without the subject's permission and then only under certain conditions. In a similar manner, research data is not publicly connected to the research subject, thereby assuring the subjects' privacy.

Another way that the research subjects' right to privacy is protected is by obtaining an informed consent and signed permission for invasive procedures used during the research process. For example, informed consent must be obtained before passing a Levine tube to obtain gastric contents for analysis. Nursing research on the privacy of human subjects is not yet documented. Potential areas for nursing research are identifying how research studies protect or do not protect the privacy of human subjects, describing research subjects' perceptions of how their privacy was protected or not protected during a study, identifying researchers' attitudes toward rules of confidentiality under different research conditions, and identifying institutional review board members' knowledge of and attitudes toward protection of human subject privacy in research studies.

The right to refuse to participate in research protects the subject from being coerced to participate in research and assures that research subjects are truly voluntary. Nursing research on the right to refuse to participate in research is not yet documented. Potential areas for nursing research are identifying the conditions under which research subjects refuse to participate in a study and describing why subjects have refused to participate in particular types of research studies.

Human subjects have the right to withdraw from a research study without any untoward treatment of them. Even though they had previously consented to participate in a research study, subjects have the right to change their minds and withdraw from the study at any time.

Nursing research on the right to withdraw from a research study is not yet documented. Potential areas for nursing research are identifying the conditions under which research subjects withdraw from a study and describing the course of treatment for subjects who do and do not withdraw from studies involving particular diseases.

The protection of human rights in research studies is important to the moral integrity of nursing research. International and professional codes of research ethics strongly support the morality of research, and the American Nurses Association's *Ethical Guidelines in the Conduct, Dissemination, and Implementation of Nursing Research* (Silva, 1995) supports the morality of nursing research. However, nursing research on the protection of human rights in research is at an early stage of development. As the 21st century approaches, nursing research should include studies of how human rights are protected in research and the factors that inhibit or promote their protection in various kinds of research designs.

Sara T. Fry

ROGERS'S SCIENCE OF UNITARY PERSONS

In 1970, Martha Rogers initially published *The Science of Irreducible Unitary Human Beings* (1990). The model is derived from many disciplines and results in an integrated whole, unique to nursing. Within this framework, Rogers describes the natural process of change, the *inherent* quality of human beings' right to choose, and the *infinite* nature of the relationship between man and the universe. Her description of nursing as a *learned profession*, resulting from a strong academic preparation and based in knowledge unique to nursing, was equally stunning and controversial. Through 1994, she revised and refined her theory. She makes several assumptions to be tested so that further nursing knowledge can be formulated: *the human being is greater than the sum of his parts; there is constant, progressive interaction between* *the human being and environment; the environment is infinite—it extends to the universe and beyond; reality is as it appears—it is constructed; energy is matter is energy; the human being can choose to engage in change.* Rogers defined four postulates as the basis of her theory: *energy fields*—in Rogers's world we *are* energy fields, as is everything around us. She uses the term "unitary" to describe the indivisible and irreducible nature of the human being–environment interaction. *Openness*—an attribute of all energy fields—a constant mutual interaction and flow, as *opposed* to a cause and effect relationship. *Pattern*—the manifestation of energy fields experienced and known by all senses. *Pandimensionality*—the boundlessness of the universe, without spatial or linear limits. Furthermore, Rogers proposed three principles of homeodynamics: *helicy*—continuous, nonrepetitive, and innovative patterning (moving forward/diversifying). *Resonancy*—patterning which changes from lower to higher frequency (responsiveness—increasing vibration). *Integrality*—the continuous mutual process between person and environment (feeling "at one" with the universe). Martha Rogers epitomized her theory: open, constantly changing, diverse, thinking without boundaries, and resonating to her world, her profession, and the future.

John Phillips
Updated by Elaine K. Shimono

ROY ADAPTATION MODEL

The Roy adaptation model for nursing defines a person as a holistic adaptive system that is in constant interaction with the environment (Roy & Andrews, 1999). As a holistic adaptive system, the person can be described as a set of interrelated arts with inputs, control and feedback processes, and outputs functioning as a whole for some purpose. Inputs for the system are stimuli received externally from the environment (external stimuli) and internally from within the self (internal stimuli). These stimuli are classified as focal, contextual, or residual. The stimuli immediately confronting the person are called focal stimuli. All other stimuli in the situation that contribute to the effect of the focal stimuli are called contextual stimuli. Stimuli whose effects on the given situation are unclear are called residual stimuli (Roy & Andrews, 1999).

The goal of nursing is "the promotion of adaptation in each of the four modes, thereby contributing to the person's health, quality of life, and dying with dignity" (Roy & Andrews, 1999, p. 55). Roy defines health as "a state and a process of being and becoming an integrated and whole person" (Roy & Andrews, 1999, p. 54). In essence, health reflects the adaptation of the individual's adaptive systems in an ever-changing environment. Within the Roy adaptation model, nursing interventions are conceptualized as the management or manipulation of stimuli (Roy & Andrews, 1999).

The elements and assumptions of the Roy adaptation model provide a perspective for nursing research by suggesting what phenomena to study, identifying the research questions, and identifying appropriate methods of inquiry. The distinctive nature of the research question is related to basic life processes and patterns, coping with health and illness, and enhancing adaptive coping. Multiple methods are appropriate when conducting research based on the Roy adaptation model (Roy & Andrews, 1999).

Numerous researchers have used the Roy adaptation model as the conceptual framework for research. Some studies used the model in the development of data collection instruments within the four adaptive models, whereas other studies used the four adaptive modes as a framework for data analysis. Chiou (2000) conducted a meta-analysis of nine empirical studies based on Roy's Adaptation Model to determine the magnitude of the interrelationships of the four modes. Additional studies identified specific concepts from the model, such as interdependence mode or physical self, and used them as the basis for the research. A number of studies identified specific links, conceptually and operationally, between the Roy adaptation model and the research variables. In these studies, specific concepts were linked to various aspects of the model, including focal, contextual, and residual stimuli control processes and adaptive modes. Yeh (2003) used this approach in research examining the relationships among social support, parenting stress, coping style, and psychological distress in parents caring for children with cancer. Zhan (2000) examined the relationship between cognitive adaptation processes and self-consistency in hearing-impaired elderly. Chen, Chang, Chyun, and McCorkle (2005) evaluated the dynamics of nutritional health in community elders using the Roy adaptation model. In one study, a secondary analysis of the meaning of living with a spinal cord injury was conducted using the Roy adaptation model as a guiding framework (De Santo-Madeya, 2006). Several studies identified nursing interventions as the management or manipulation of stimuli, and some specifically tested propositions derived from the model (e.g., Jirovec, Jenkins, Isenberg, & Baiardi, 1999).

Among the studies, there were differences in methodologies, designs, data collection procedures, and data analysis techniques. Barone, Roy, Keville and Frederickson (2008) identified and critiqued the instruments most frequently used to measure the concepts of the Roy adaptation model. Shyu (2000) illustrated the role function mode in Roy's Adaptation Model using constant comparison to analyze the data. Yeh (2001) used a qualitative approach to establish a framework for the adaptation process of Taiwanese children with cancer. The studies reviewed revealed that the Roy adaptation model was appropriate for guiding research in a variety of settings and populations. Villareal (2003) demonstrated the use of the Roy adaptation model in young women contemplating smoking cessation. The Roy adaptation model has also been applied in practice when caring for menopausal women (Cunningham, 2002). Rogers and Keller (2009) applied the Roy adaptation model to promote physical exercise among sedentary older adults. The intervention used was mind-body-spiritual physical exercise impacting the physiological, psychological, and self-concept modes of the model with the main focus on adaptation to aging. Isbir and Mete (2010) applied the Roy model to the care of women with nausea and vomiting in pregnancy. Nayback (2009) identified the Roy adaptation model as a suitable framework to help understand posttraumatic stress disorder in combat veterans.

Among those who have built a program of research using the Roy adaptation model are Fawcett, Pollock, and Tulman. Fawcett and Tulman (1990) conducted methodological instrument development and substantive research related to childbearing families. Retrospective and longitudinal studies examined factors associated with functional status during the postpartum period, and one study (Fawcett, 1990), tested an intervention derived from the Roy adaptation model. Fawcett et al. (2005) have expanded the initial research (Fawcett, 1990) to a large international multisite research program focused on adaptation to cesarean birth. Pollock (1993) and colleagues conducted a series of five longitudinal studies to examine human responses to chronic illness by identifying predictors of adaptation to chronic illness and determining whether adaptive responses differed by diagnostic group. A number of middle range theories have been developed from the Roy model. These include middle range theory of chronic pain (Dunn, 2005) and one on adaptation to diabetes (Whittmore & Roy, 2002). These studies demonstrate the usefulness of the Roy adaptation model as a guide for nursing research and support the credibility of the model. In 2009, De Santo-Madeya and Fawcett (2006) observed that Roy's concept of adaptation was seldom used research guided by the Roy adaptation model. This prompted them to translate Roy's concept of adaptation into a congruent middle range theory concept of adjustment (De Santo-Madeya & Fawcett, 2006). In addition, they developed a single-item scale to measure this new concept (De Santo-Madeya & Fawcett, 2006). Using the Roy adaptation model to guide nursing research has contributed to both the basic and clinical sciences of nursing. Studies have provided some confirmation for the model, demonstrated its ability to generate new information, and contributed to clinical practice.

The Roy adaptation model is being used by nurses throughout the world. Researchers and scholars as far afield as Japan, Columbia, Mexico, and Puerto Rico are testing and applying the model in a variety of settings (Roy, Whetsell, & Frederickson, 2009). Many of these countries have set up chapters of the Roy adaptation association, and held conferences and workshops related to the model (Roy et al., 2009). This global expansion provides new horizons and different cultural perspectives for the application and testing of the Roy adaptation model. Overall, the Roy adaptation model is a very useful model in practice and as a guide to research. The Roy adaptation model continues to make a significant contribution to nursing science as it continues to evolve.

Updated by Mary T. Quinn Griffin

RURAL HEALTH

It is estimated that about 20% of the U.S. population lives in the 75% of the U.S. land mass considered rural (Institute of Medicine [IOM], 2005, 2006c). However, there is no single definition for what constitutes rural. There are more than 15 definitions of rural used in federal programs in the United States (Coburn, MacKinney, McBride, Slifkin, & Wakefield 2007). No matter the definition, the number of rural dwellers varies greatly by state, for example, using the U.S. census definition, Maine, Mississippi, Vermont, and West Virginia have more than 50% of their residents in rural areas, and states like California and Nevada have less than 10% (U.S. Census Bureau, 2000). Looking beyond the numbers, the term rural brings to mind landmasses between urban areas with farmland, mountains, forests, and open ranges with sparsely populated remote areas and small towns. For some rural residents, it is the place where, for generations, they have engaged in farming, ranching, mining, or logging; and for others, it is an escape from urban tensions—a place to recreate and to relax. For those providing health care, there are unique challenges and opportunities in the rural setting.

One of the greatest challenges is the high rates of poverty in rural areas. The last decade's bouts of recessions have hit rural areas harder than the surrounding urban areas (Economic Research Services, 2009). The national poverty rate was 12.5% in 2007, but in rural areas, it was 15.4%. Concurrently, rural areas also saw a sharper increase in unemployment rates and, subsequently, the uninsured. Although rural areas in general have higher rates of unemployment, decreases in employment were seen in both traditional rural jobs, for example, the timber industry, and jobs in employment sectors that cover both rural and urban areas, such as manufacturing, construction, transportation and utilities, wholesale and retail trade, and professional business services. The higher unemployment rate is partly because rural residents are less likely to have completed high school and even fewer have a college degree (IOM, 2006). The problem is not necessarily the lack of educational opportunities but rather that young people often move to metropolitan areas after graduation. Rural America is still the site of our food production, but only 1.1% of the U.S. population lives on farms (IOM, 2006). Even fewer people live off the farm. About 70% of either the farmer or the spouse works off the farm for their income. A major employer in many rural communities is the hospital, which thus plays an essential part in the economic and social identity of a community (Moscovice & Stensland, 2002).

Rural areas have a high percentage of older adults and people with chronic diseases (IOM, 2006). Rural residents have higher rates of chronic conditions caused by unhealthy lifestyles such as smoking, lack of exercise, and obesity (IOM, 2005). Depression and substance abuse are more common among rural residents compared with urban residents (Kessler, Chiu, Demler, Merikangas, & Walters, 2005). With 41% of rural women reporting symptoms of depression compared with 13% to 20% of urban women, suicide rates are as much as three times higher for rural women (American Psychological Association, 2005). The aging of rural residents, along with the higher likelihood of having chronic health problems and poorer health status, are factors when planning and providing health care in rural areas.

Other health care concerns include the high rates of farm injuries, especially among the youth. According to the National Institute of Occupational Safety and Health (2008), it was estimated that 23,100 children and adolescents were injured on farms in 2006. Rural health care providers also need to be prepared to care for recreational visitors in areas with a high influx of tourists during certain times of the year. Both general services and specialized services, such as those needed to treat people involved in accidents, are higher demands during these seasonal peaks (IOM, 2006).

It is not only the characteristics of rural populations that challenge the delivery of rural health care, but also whether health care services are available. The major barriers for rural residents to have access to health care are shortages of clinicians, facilities, and specialized services as well as geographical and climatic conditions that affect travel conditions to health care providers and facilities (IOM, 2005). There are 53 primary care physicians per 100,000 rural residents compared with 78 per 100,000 urban residents. The gap between rural and urban is even wider for specialists, with 54 and 134 specialists per 100,000 residents, respectively (Reschovsky & Staiti, 2005). For nurses, the issues are a bit different. From 1980 to 2004, the proportion of registered nurses who lived in rural areas grew from 14.9% to 18%, but so did the number of nurses who resided in rural areas but commuted to work to an urban area (Skillman, Palazzo, Hart, & Butterfield, 2007). In 1980, 86.1% of registered nurses lived and worked in rural areas, and by 2004, the number was 62.9%; leaving rural areas with fewer nurses and vacancies that are hard to fill.

With the burden of chronic diseases and disability for rural populations, the resource-poor rural care system is experiencing great demands. For these reasons, rural residents are considered an underserved population that needs special attention. In recent years, many approaches have been developed to close the health care gap between rural and urban areas. One example is the approximately 1400 critical access hospitals (CAHs) in rural areas. Recognizing the vital role of (especially the small) rural hospitals prompted Congress in 1997 to create the Medicare Rural Hospital Flexibility program (Flex Program). This initiative allows small hospitals to be licensed as CAHs and offers grants to states to help implement initiatives to strengthen the rural health care infrastructure. To be a CAH requires certification as such before January 1, 2006 or rural location, and to be more than 35 miles (or 15 miles in areas with mountainous terrain or only secondary roads available) from another hospital (Gale, Coburn, Gregg, Slifkin, & Freeman, 2007). In return for CAH status, hospitals provide 24-hour emergency care services availability, have a maximum of 25 acute care and swing beds (a bed used for either acute or skilled nursing facility care), and maintain an annual average length of stay of 96 hours or less for their acute care patients.

The problems and disadvantages that rural areas experience may contribute to the often strong sense of a unique rural culture and community connectedness among rural residents. The value and beliefs in a rural culture play key roles in how rural people define health and from whom they seek advice, treatment, and care. The culture combined with realities of rural living, such as weather, distance, and isolation, affects the practice of nursing in rural areas. Knowledge of the rural culture is a basic requirement if a nurse wants to work effectively in a rural community, but also a strong influence on the individual's health (Baernholdt, Jennings, Merwin, & Thornlow, 2010; Leipert & George, 2008). The community connectedness where nurses and patients know one another outside the health care setting can create boundary-related ethical conflicts (Nelson, Pomerantz, Howard, & Bushy, 2007). Such situations are challenging because they bring into play competing roles of values, duties, and community expectations to the classic ethical understanding of the nurse–patient relationship. However, the community connectedness can also translate into the nurses' commitment to give quality care and attempts to break unhealthy family histories of obesity-related diabetes or teen pregnancy (Baernholdt et al., 2010). Rural nurses also have to be a "Jack-of-all trades." They have to take on nonnursing roles, such as transporting patients, cleaning, and secretarial duties in hospitals when nobody else is available on the off-hours. Their nursing practice also has to be very broad (Scharff, 2010). They are advanced generalist nurses who are able to care for a great variety of patients beyond a regular nurse's scope of practice. In addition, they often have to do so with limited resources and support systems. Yet the rural nurses face challenges keeping up with their professional knowledge and skills because of limited educational opportunities (Newhouse, 2005). Despite these shortcomings, rural nurses are not less satisfied with their jobs compared with their urban counterparts (Baernholdt & Mark, 2009).

Knowledge generation and acquisition are needed for rural nursing practice. Although the knowledge base is growing, there continues to be a limited number of data-based articles in the rural nursing literature. Continuing shortfalls in the literature include small sample sizes, lack of random sampling, cross-sectional designs, problems with operationalization and measurement of rurality, and small specific populations. Studies lack clear descriptions of comparison groups and often fail to adequately account for key variables (Merwin, 2008).

Positive signs of the growth of rural nursing science are appearing. Among these are more articles about rural nursing in journals of rural health, the creation of the *Online Journal of Rural Nursing and Health Care*, a whole issue of the *Annual Review of Nursing Research* focused on rural health, programs of rural nursing research (including multisite projects), National Institute of Nursing Research (NINR)–funded research centers focused on rural health, new graduate programs (including at the doctoral level for preparation in rural health), and use of new technologies for education and in nursing research.

The *Online Journal of Rural Nursing and Health Care*, which focuses on dissemination of rural nursing research and health care information, is a sign of progress. In the first decade of the journal, there have been a cluster of projects published addressing some of the pressing health issues, such as women's health, children and adolescents, the elderly, caregiving, and issues associated with managing cancer, stroke, Alzheimer's disease, and end-of-life care in the rural setting. Programs of rural nursing research are developing: Fahs and colleagues at Binghamton University, on cardiovascular disease and rural women; Hauenstein and colleagues at University of Virginia, on rural women's mental health; Magilvy and colleagues, at the University of Colorado, on the community health needs of elderly rural populations; Utz and colleagues at the

University of Virginia, using community participation to increase diabetes self-care in rural areas; Weinert and colleagues, at the Montana State University–Bozeman, using computer-based technology to provide support and health information to isolated rural women living with a chronic health condition. Cross-state studies are being designed to tease out which characteristics are somewhat universal across rural populations and which may be specific to a certain rural population. One example is the work of Shreffler-Grant at Montana State University–Bozeman, and her colleagues at the University of North Dakota, who are exploring the use of complementary therapy by rural older adults. Another is Fahs' group, from Binghamton University, who examined how to promote heart health in rural women across state lines.

The Center for Research on Chronic Health Conditions in Rural Dwellers at Montana State University-Bozeman, funded through the NINR Exploratory Centers Program, provides an opportunity to strengthen rural research and is forging research linkages between Montana nurse scientists and rural nurse investigators in Oregon, Iowa, Wyoming, North Dakota, and Nebraska. Likewise, the NINR-funded multidisciplinary Rural Health Care Research Center at the University of Virginia brings key stakeholders in rural health together to set the rural research agenda for Virginia at its surrounding states with pilot studies including telehealth, community participatory research, and palliative care.

The launching of the nursing doctoral program at Binghamton University will increase the number of individuals prepared to conduct necessary rural research. Although the masters' degree and Doctor of Nursing Science programs at the University of Virginia will increase nursing leaders in community/public health leadership, health systems management, or psychiatric mental health with expertise in rural health care. The program uses a distance learning platform in which technology allows students to interact live weekly from remote locations in a virtual classroom. The program is a good example of how the explosion of activity in the arena of telecommunications has been a boon to rural nursing education, bringing whole degree programs and current practice and research knowledge to the fingertips of nurses in the remotest of areas.

Clearly, there is progress in the development of the body of knowledge about rural health and rural health nursing, as well as in the ways in which rural nurses can continue their education and keep competencies and knowledge up-to-date. However, the progress will stop without sustained efforts to increase rural nursing research and availability of technology in rural areas. The advances in nursing science and education, along with better understanding of historical factors, changing demographics, health disparities, strengths, and resources of rural communities/individuals, can enhance health for people in rural settings.

Marianne Baernholdt

S

SAMPLING

Sampling is a process for selecting a representative part of the population of interest so that one can make valid inferences and generalizations from the sample to the population. A sample is more feasible, economical, and practical than using the whole population. It also often is more accurate than trying to measure the entire population. This is because the greater number of cases in a population, as compared with a sample, increases the likelihood of nonsampling errors such as measurement errors, nonresponse biases, and recording and coding errors. Although many think of sampling representativeness in descriptive terms as only an issue of external validity, or generalization, sampling also is concerned with the relationships found. Therefore, sampling errors or biases may threaten the internal validity of studies as well. Samples, however, are not technically in and of themselves “representative,” “unbiased,” or “fair.” It is the sampling process that is representative, unbiased, or fair. This is because we rarely if ever know the true population values and therefore cannot determine if any given sample is truly representative of the population. Rather, we rely on the assumptions underlying our sampling process to make assertions about representativeness or bias.

There are several types of sampling. Simple random sampling, or probability sampling, is a procedure that may involve the use of a table of random of numbers or the flip of a coin to determine who or what will be included in the sample. A key feature of simple random sampling is that each case has a known, nonzero probability of being selected. This approach, however, is often impractical and tedious and is not used much. A more commonly used type of random sampling is systematic random sampling. Systematic random sampling involves the use of a random start, and then the selection of every *k*th case or incidence (e.g., every 5th, 10th, and 35th case). This approach is more convenient than simple random sampling, but it can have variance estimation problems. A minimum of two systematic random samples with independent random starts are needed to estimate variance, unless one can assume a random distribution of the cases on the list from which one has sampled.

When using systematic random sampling, one must be very careful that the list used does not have some systematic order or periodicity. If so, systematic random sampling may lead to a seriously misrepresented sample or pattern. For example, one might inadvertently select all nurse managers or obtain blood samples only when certain hormones are at their peaks, if the sampling interval mimics the sequencing of nurse managers on the list or the time interval at which the hormone peaked.

Stratified sampling is another type of random sampling. It involves identifying one or more classification variables to use for sampling purposes. With stratified sampling, one randomly samples within each nonoverlapping strata of the classification variables. For example, if sex is the classification variable, then one randomly samples men and women separately; if basic educational preparation of nurses is the classification variable, then one randomly samples from those with associate degrees and those with baccalaureate degrees separately.

For research purposes or gains, it is best to select classification variables based on their assumed association with the dependent variable. If more than one classification variable is used, it also is advantageous if they are uncorrelated with each other. Stratified sampling facilitates obtaining subgroup parameter estimates and comparisons—especially when some strata are rarer and stratification is used to ensure an adequate number of cases in each stratum for valid comparisons. Stratified sampling also may increase the statistical efficiency of estimates if proportional allocation (as opposed to equal allocation) is used, and may be more convenient if sampling lists are organized according to the selected strata.

The intent with stratified sampling is to decrease sampling variability by increasing the homogeneity of the strata. If one forced equal numbers of cases in each stratum, it is important to remember that the resulting sample will not reflect the natural distribution of the classification variable. In those cases, one must assign weights to the cases to reflect the known proportionate distribution of the strata in the population if one wishes to conduct analyses involving the classification variable in addition to analyses comparing the strata within each classification variable. Stratified sampling, however, may be more costly and complex. Lastly, the control advantages of using stratified sampling are limited because stratification generally is applied to some, but not all, variables of interest.

Cluster sampling is a fourth type of random sampling. With cluster sampling, the elements of interest for the study and the sampling units are not same. The sampling unit, or cluster, is a convenient, practical, and economical grouping—for example, practice sites; hospitals—whereas the elements of interest for the study may be the individual patients obtained at the practice sites or hospitals. With cluster sampling, one randomly samples the clusters and then takes all elements (or a relevant, random subset) within each cluster. In contrast to stratified sampling where one samples from all strata of the classification variable, with cluster sampling one samples only some clusters, for example, some practice sites or some hospitals.

Whereas the goal of stratified sampling is to obtain homogeneous strata, when one does cluster sampling one wants the clusters to be as heterogeneous as possible. To the extent that the clusters are not heterogeneous, one loses precision and the cluster sample is less efficient than a simple random sample of the same size. At the extreme, if the cluster is completely homogeneous, one achieves no gain from more than one case per cluster. Cluster sampling generally is used for pragmatic purposes when there is no other way to easily obtain the targeted sample than through the identification of clusters.

The last type of sample discussed here is convenience samples or nonprobability samples. These are frequently used in nursing research, but their implications often are ignored. First, it is not possible to estimate sampling errors with such samples. Therefore, the validity of inferences drawn from nonprobability samples to the population remains unknown and whenever nonrandom selection is used, the potential for serious sample selection biases exists.

Lastly, it is important to note that sample selection bias may threaten internal as well as external validity (Berk, 1983). One way in which this may happen is when investigators inadvertently sample on their dependent variable by excluding cases at either the high or low end of values on the dependent variable. For example, if one is studying the impact of amputation on depression and quality of life, but screens out all those currently diagnosed with and on medications for depression, one may obtain an erroneous or misspecified model because those at one end of the depression continuum have been excluded from the sample. In a bivariate analysis, this misspecification will include either an attenuation or exaggeration of the relationship between the dependent and independent variable depending on the location of the excluded cases. In the more common multivariate situation, we cannot predict whether the relationship we seek to identify is attenuated or exaggerated, but we do know it will be misspecified. For this reason, sampling on one's dependent variable should never be done.

Lauren S. Aaronson

SCHIZOPHRENIA

Schizophrenia, the most serious and persistent of the brain diseases in psychiatry, strikes about 1.3% of the population worldwide regardless of race, ethnic group, gender, or country of origin (National Institute of Mental Health, 2010). Research and technological advances over the past 25 years has redefined schizophrenia as a major neurobiological disease, a concept in psychiatry that now replaces outdated psychological theories of causation, yet schizophrenia remains the most stigmatized illness of all medical diagnoses. Worldwide there are at least 450,000,000 persons with mental health diagnoses, yet more than 80% do not receive treatment (World Health Organization, 2004). Approximately 2,200,000 people in the United States suffer from schizophrenia and the accompanying stigma. In three out of four cases, the illness begins between the ages of 17 and 25 years, robbing its victims of their most productive young adult years. The disease typically strikes males at a younger age than females. The average life span of a person with schizophrenia is 20% shorter than that of the general population due to the frequent occurrence of comorbid medical and psychiatric conditions (Carney, Jones, & Woolson, 2006).

The criteria for diagnosis in the American Psychiatric Association's (2000) *Diagnostic and Statistical Manual* (4th edition, text revision) requires that at least two of the following be present for a significant portion of time during a 1-month period: delusions, hallucinations, disorganized speech, grossly disorganized or catatonic behavior, and negative symptoms that refer to cognitive deficits such as alogia, poverty of speech, avolition, and flattening of affect. For a significant portion of the time since the onset of the disturbance, one or more major areas of functioning, such as work, interpersonal relations, or self-care, is markedly below the level achieved before the onset. Continuous signs of the disturbance must persist for at least 6 months. Diagnostic criteria require that medical and substance abuse etiology be ruled out.

The difficulty with the current diagnostic criteria is that two different people with a combination of these various symptoms can each be diagnosed with schizophrenia, yet have a totally different symptom configuration. None of these symptoms is unique to schizophrenia alone as each of these symptoms can be found in many other psychiatric diagnoses. A more recent approach to symptom clusters includes three categories of symptoms: positive, negative, and cognitive. Positive symptoms refer to symptoms that result from an exaggeration of normal brain functions and include delusions and hallucinations. Negative symptoms are those that result in a loss of normal functioning and include apathy, emotional flatness, loss of the ability to initiate speech, loss of pleasure in activities that normally result in enjoyment, inability to initiate movement, inability to motivate self, and inability to sustain attention. Cognitive symptoms refer to loss of ability to understand the source of symptoms, loss of executive functioning including judgment, orientation, communication, memory, and ability to prioritize and organize thoughts.

Approximately 400,000 acute episodes occur annually in the United States and three million occur worldwide. Complete recovery from a psychotic episode can take months to years depending on the severity, presence of psychosocial support, and response to medications. Schizophrenia is ranked fourth of the top 10 of all diseases worldwide in terms of burden of illness. The top three are unipolar disorder, alcohol use, and bipolar disorder. Schizophrenia ranks second in women age 14 to 44 years of all diseases worldwide in terms of burden of illness. It is projected that by 2020, neurobiological illnesses will account for almost 15% of all illnesses worldwide (World Health Organization, 2004). Twenty to fifty percent of patients with schizophrenia attempt suicide, and 10% of them succeed.

Schizophrenia accounts for 40% of all long-term care hospital days. The cost of schizophrenia in the United States in 2002 was estimated to be $62.7 billion (McEvoy, 2007). These costs include direct care in institutions and the community as well as in indirect costs of loss of productivity, caregiver burden, and law enforcement. Tragically, in 2010, it is now three times more likely that a person with schizophrenia will be treated in a forensic setting as compared with a hospital (Torrey, Entsminger, Geller, Stanley, & Jaffe, 2010). Currently, there are 280,000 persons with mental illness in jails and prisons compared with 70,000 in hospitals. On any given day, 1.8 million people with schizophrenia and bipolar disorder go without treatment. More than two-out-of-five of our most severely mentally ill people go untreated. This places the people who need treatment the most, and the whole nation, at risk. Approximately 200,000 Americans with untreated severe mental illness are homeless.

The cause remains unknown, but neuroanatomical, neurophysiological, and neuroelectrical abnormalities have been identified. Genetic associations have also been discovered. The cure remain elusive; however, treatments have dramatically improved since the initiation of the recovery philosophy in the 1970s (Corrigan, Mueser, Bond, Drake, & Solomon, 2007). At least 75% of persons with schizophrenia respond well to psychotropic medications and psychiatric rehabilitation and can live successfully in the community with the proper social support. Early diagnosis and treatment has been proven to decrease disability (Addington & Addington, 2009). However, the majority of the persons with chronic schizophrenia do not receive treatment, which contributes to the chronicity often associated with this illness.

A CINAHL and OVID search of schizophrenia research articles published in all nursing journals from 2005 to 2010 returned 119 articles that were categorized as (1) caregiver and family burden ($N = 18$); (2) children and adolescents ($N = 2$); (3) inpatient treatment ($N = 8$); (4) management of hallucinations and delusions ($N = 9$); (5) outcomes measures and assessment tools ($N = 10$); (6) psychoeducation ($N = 4$); (7) psychosocial rehabilitation ($N = 15$); (8) psychotherapy ($N = 6$); (9) stigma ($N = 4$); (10) symptom management and relapse prevention ($N = 8$); (11) treatment adherence and medication management ($N = 15$); (12) wellness, lifestyle, and medical comorbidity ($N = 13$); and (13) women's issues ($N = 6$). This distribution of nursing research reflects a dramatic increase in programmatic and treatment innovations by nurses in the past 5 years.

Mary Moller
Kathleen Fentress

Secondary Data Analysis

Secondary data analysis uses the analysis of data that the analyst was not responsible for collecting or data that was collected for a different problem from the one currently under analysis. The data that are already collected and archived in some fashion are referred to as secondary information. Statistical meta-analysis might be considered a special case of secondary analysis (see *Meta-Analysis*).

Secondary information is an inexpensive data source that facilitates the research process in several ways. It is also useful for generating hypotheses for further research. It is useful in comparing findings from different studies and examining trends. Population data sets, such as Bureau of the Census data, may be used to compare sample with population characteristics to examine the representativeness of the study sample.

The analysis of secondary information is a useful strategy for learning the research process. The secondary data sets that have used optimum sampling techniques provide an optimum resource for students by virtue of the quality of sampling and the time and expense involved in data collection. Given that students are expected to understand, to explain, and to defend the data set in terms of purpose, sample selection, methods, and instruments, only the real-life collection and recording of data remain are not experienced by the student. Another advantage of using secondary data analyses while learning to do research is that it protects the pool of potential research participants and agencies for participation in studies conducted by qualified researchers.

Every research study is conducted with a specific purpose in mind. Delimitations are specific to the original study and introduce specific types of sampling and other bias into the original study. Operational definitions may not be replicable in a second study. For learning purposes, differences in the original study and data set can be handled through careful critique processes by students. However, the biases and differences that exist may be too extreme to permit a valid secondary analysis outside the practice situation.

Archived data sets are rarely held in the form of raw data because the data are usually summarized. The summarization may or may not be appropriate for the research question under consideration for secondary analysis. To analyze such data further confounds results beyond acceptable limits.

The question of using clinical nursing data sets for secondary analysis comes with the advent of clinical nursing information systems. The use of clinical databases as research data sets must be examined carefully. One difficulty is that restricted data resources force clinicians to choose carefully which data to collect. These data are usually not identical with what the researcher needs.

Beyond data restrictions, another major difficulty is that the sample biases of clinical databases and research data sets for randomized control studies are different. This difference in bias of the data from clinical databases and randomized controlled trial research data sets can be exploited as a strategy for doing cross-design synthesis. However, this special case aside, the issue is that of sample representativeness. The research sample is selected for a specific reason, with specific delimitations in mind, to be representative of the general population. In contrast, the clinical population from which the clinical data set is drawn is representative only of that type of patient or client on whom data is being collected in that location and rarely, if ever, typical of the general population or even all persons with that clinical problem. For example, patients with congestive heart failure in Alabama are not necessarily representative of patients with congestive heart failure in New England or California. The same is true of patients with congestive heart failure in a community hospital versus those in a teaching hospital in the same county.

These caveats necessitate close evaluation of data sets to be used for secondary analysis. The information needed for such evaluation must be archived along with the data set. Such information includes study purpose; data collection details, such as who collected the data, when, and where; sampling criteria and delimitations; known biases; operational definitions; and methods of data collection.

Traditionally, nursing has not archived research data sets of its own for use in teaching or secondary analysis. Nursing students and nurse researchers do use large government databases, but none are collected specifically by nurse researchers to answer nursing research questions. This is a problem to the extent that learning takes place best when examples and experiences relate closely to daily (nursing) experience. Certainly, problems peculiar to but not exclusive to nursing research are more easily taught with examples from real life. This is a problem also to the extent that nursing research data sets can, in fact, generate new knowledge, whether by reanalysis or by stimulation of further investigation and hypothesis generation.

Judith R. Graves

SELF-EFFICACY

Self-efficacy, which is the primary component of social cognitive theory, is defined as an individual's judgment of his or her capabilities to organize and execute courses of action to achieve a certain goal (Bandura, 1977, p. 1; 1986, p. 2; 1995, p. 3; 1997, p. 4; Bandura, Adams, & Beyer, 1977, p. 7). Bandura differentiates self-efficacy expectations from outcome expectations. Outcome expectations are a person's judgment that a given behavior will lead to certain outcomes. Self-efficacy and outcome expectations were differentiated because individuals can believe that a certain behavior will result in a specific outcome; however, they may not believe that they are capable of performing the behavior required for the outcome to occur.

The early research using the theory of self-efficacy was done to test the assumption that exposure to treatment conditions could result in behavioral change by altering an individual's level and strength of self-efficacy. In the initial study (Bandura, 1977, p. 7), 33 subjects with snake phobias were randomly assigned to three different treatment conditions: (1) enactive attainment, which included actually touching the snakes, (2) role modeling or seeing others touch the snakes, and (3) the control group. Results suggested that self-efficacy was predictive of subsequent behavior, and enactive attainment resulted in stronger and more generalized (to other snakes) self-efficacy expectations. Since that early work, Bandura and colleagues have repeatedly demonstrated that individuals become efficacious in a particular domain of function through four mechanisms: enactive mastery experience, vicarious experience, verbal persuasion, and physiological and affective states (Bandura, 1997, p. 4).

The theory of self-efficacy has been used extensively in nursing research with regard to describing and evaluating behaviors as well as developing and implementing interventions. Most recently, the use of self-efficacy theory in nursing has focused on health behaviors (e.g., exercise, cancer screening), cultural competence of nurses, function and self-care, nursing care competence and behaviors (e.g., dementia care), patient self-management, breastfeeding for new mothers, and infant self-care. Increasingly, use of self-efficacy has extended to include multiple cultures (e.g., Chinese, Korean, African American), all age groups and both men and women. What is central to the use of the theory of self-efficacy in nursing research is for the researcher to maintain a fit between the behavior that is being considered and efficacy and outcome expectations. For example, if the behavior of interest is adhering to a low-salt diet, the self-efficacy measure should focus on the challenges related to this specific behavior (when out to dinner, etc.).

Self-efficacy has been used to improve and understand health behaviors with regard to exercise (Chang, Fang, & Yang, 2006, p. 13; Hays, Pressler, Damush, Rawl, & Clark, 2010, p. 14; Lee, Arthur, & Avis, 2008, p. 15; Murrock & Madigan, 2008, p. 12; Resnick, Gruber-Baldini, et al., 2009; Resnick, Luisi, et al., 2008; van den Akker-Scheek et al., 2007, p. 8). Specifically, these nursing studies considered the impact of motivational interventions and engaging individuals in exercise activities on self-efficacy expectations and explored relationships between self-efficacy and outcome expectations and exercise behavior. In contrast to Bandura's earlier findings (Bandura, 1997, p. 4), which stressed that self-efficacy expectations were better predictors of behavior than outcome expectations, in several nursing studies outcome expectations, rather than self-efficacy expectations, were predictive of exercise behavior (Murrock & Madigan, 2008, p. 12; Resnick, Luisi, et al., 2008).

Self-efficacy theory has also been used to address health behaviors such as healthy eating in rural women (Walker, Pullen, Hertzog, Boeckner, & Hageman, 2006, p. 16), health promoting behaviors in incarcerated men (Loeb, Steffensmeier, & Lawrence, 2008, p. 17), osteoporosis screening (Hsieh, Wang, McCubbin, Zhang, & Inouye, 2008, p. 18), Papanicolaou (Pap) testing (Tung, Nguyen, & Tran, 2008, p. 19) in Asian adult samples, and smoking cessation (Kim, 2006, p. 36). Across all of these studies, there were significant positive relationships between self-efficacy and the behavior of interest.

Cultural competence in nurses has been considered by using a measure of knowledge of cultural concepts, knowledge of cultural life patterns for specific ethnic groups, and self-efficacy in performing cultural nursing skills (Hagman, 2006, p. 20). Findings indicated that nurses were moderately efficacious in cultural knowledge and abilities. Self-efficacy expectations associated with dementia care management has also been considered (Connor et al., 2009, p. 22), as has self-efficacy for providing restorative care (Resnick, Luisi, et al., 2008), self-efficacy for knowledge of use of assistive devices (Roelands, Van Oost, Depoorter, Buysse, & Stevens, 2006, p. 24), and self-efficacy for professional nursing behavior (Manojlovich, 2005, p. 25). Self-efficacy either directly influenced outcome behaviors or mediated these behaviors.

Self-efficacy has been considered with regard to functional performance, particularly with regard to adults undergoing orthopedic interventions (Resnick, Gruber-Baldini, et al., 2009; van den Akker-Scheek et al., 2007, p. 8). Although interventions did not always strengthen self-efficacy with regard to functional behaviors, there was an association between these beliefs and performance of function.

Nursing research frequently uses self-efficacy theory to address self-care and self-management across a variety of clinical problems. For example, self-efficacy has been used with regard to self-care management after acute cardiac events and associated with congestive heart failure (Hiltunen et al., 2005, p. 30; Padula, Yeaw, & Mistry, 2009, p. 29), diabetes self-care management (Utz et al., 2008, p. 31), and self-management for peritoneal dialysis (Su, Lu, Chen, & Wang, 2009, p. 32) for managing depression (Weng, Dai, Wang, Huang, & Chiang, 2008, p. 33), back pain (Göhner & Schlicht, 2006, p. 34), and birth control. Nursing interventions intended to improve adherence to self-care behaviors were guided by self-efficacy theory in these studies, and findings indicated that there were improvements in self-efficacy as well as anticipated behaviors.

Another common use of self-efficacy theory in nursing research is around the area of mothering, specifically with regard to breastfeeding and infant care (Noel-Weiss, Rupp, Cragg, Bassett, & Woodend, 2006, p. 38; Padula et al., 2009, p. 29; Prasopkittikun, Tilokskulchai, Sinsuksai, & Sitthimongkol, 2006, p. 39). Self-efficacy expectations were shown to be associated with breastfeeding and infant care and interventions to strengthen self-efficacy associated with these behaviors improved adherence to nursing behaviors.

Self-efficacy is situation specific, and it is not clear how generalizable self-efficacy expectations are from one behavior to another. Future nursing research needs to focus on the degree to which specific self-efficacy behaviors can be generalized. Measurement of self-efficacy and outcome expectations requires the development of situation-specific scales with a series of activities listed in order of increasing difficulty, or by a contextual arrangement in nonpsychomotor skills such as dietary modification. It is important for nurse researchers to carefully construct relevant scales and establish evidence of reliability and validity.

There has been some evidence in nursing research that outcome expectations have an important influence on behavior, in some cases may be more relevant than self-efficacy expectations. Ongoing studies are needed to continue to evaluate the impact of both self-efficacy and outcome expectations on behavior change as well as develop and test interventions that strengthen these expectations.

Lastly, self-efficacy-based interventions need to continually be tested and evaluated and specifically to be considered among different cultural groups. In so doing, nursing will be able to accrue evidence-based, theoretically driven interventions to guide practice across multiple settings and populations.

Barbara Resnick

SERIOUS MENTAL ILLNESS

Serious mental illness (SMI) is "a diagnosable mental, behavioral, or emotional disorder of sufficient duration to meet diagnostic criteria specified within the *Diagnostic and Statistical Manual for Mental Disorders* (*DSM*) that has resulted in functional impairment which substantially interferes with or limits one or more life activities" (President's New Freedom Commission on Mental Health, 2003). In contrast, "serious and *persistent* mental illness" is defined as "a sub-population of patients with SMI (approximately 2.6% of all adults) who generally have diagnoses of schizophrenia, severe depression or bipolar disorders, obsessive-compulsive disorders and panic disorders and are disabled enough to qualify for disability benefits from the Social Security Administration" (U.S. Department of Health and Human Services, 1999).

Schizophrenia is characterized by so-called "positive" symptoms of delusions and hallucinations and "negative" symptoms, such as apathy, social withdrawal, and amotivation. Mood disorders, particularly bipolar disorders, are characterized by mood swings, negative or grandiose thinking, and increased risk of suicide. In both groups, social functioning is often impaired, and in the most severe cases, employment and independent living are difficult if not impossible. The illnesses can have episodic trajectories, with periods of relatively high functioning punctuated by periods of low functioning or even crises requiring immediate treatment. Symptoms of SMIs often make adherence to treatment recommendations difficult.

Historically, the treatment of SMI changed dramatically with "de-institutionalization" that followed the Community Mental Health Centers Act of 1963 and involved a large-scale shift from caring for mentally ill persons in large state psychiatric facilities to more community-based treatment programs. One model that was developed in the 1970s and has since been replicated in various forms across the United States is the Assertive Community Treatment model. The Assertive Community Treatment delivers comprehensive 24-hour treatment to clients with SMI in the community. Interdisciplinary teams address a myriad of clients' needs, from basic daily requirements, employment, financial assistance, and housing to clinical interventions to enhance medication management (Stuart, 2009).

Inpatient stays have become increasingly short, in some cases, only a few days. As a result, community treatment is critical to address residual symptoms remain that must receive treatment in the community setting. Relapse is common in the first year following initial diagnosis and readmission to inpatient treatment is a significant feature of the illness trajectory of patients with SMI. Relapse rates ranging from 40% to 80% in the first year after discharge have been reported (Irmiter, McCarthy, Barry, Soliman, & Blow, 2007; Stevens & Sin, 2005). The cost of relapse in this population has been estimated to be almost $2 billion annually in the United States (Weiden & Olfsson, 1995). In a recent prospective study of 1,557 patients with schizophrenia, 20% had relapsed in the 6 months before the study, their cost of health care was almost three times as much as those who had not relapsed (Ascher-Svanum et al., 2010).

Most SMIs are treated with medications. Newer "second-generation" antidepressants and antipsychotic medications present more treatment options with fewer disabling or disturbing side effects. Second-generation antipsychotic medications for schizophrenia, for example, are more successful for some patients in targeting the negative symptoms (e.g., amotivation, anhedonia) than earlier drugs. However, they have increased risk for metabolic syndrome, and weight gain is a serious concern for patients. Moreover, medication adherence continues to be a significant problem for patients with SMIs, suggesting that more research is needed to understand and address this important problem.

A contemporary concern for researchers is the increased risk for cardiovascular disease in patients with SMI. Prevalence of cardiovascular risk factors is greater in patients with SMI than in the general population (27% vs. 17%) and mortality risk from cardiovascular disease is two to three times that of the general population (Robson & Gray, 2006). In a recent meta-analysis of risk factors for cardiovascular disease (Osborn et al., 2008), diabetes was found to be the strongest cardiovascular risk factor and patients with a diagnosis of schizophrenia are almost twice as likely to have diabetes. "Metabolic syndrome" is a cluster of medical conditions that have been identified in patients with schizophrenia taking newer generation antipsychotic medications. This syndrome consists of a higher incidence of obesity, hyperlipidemia, and diabetes. Patients receiving antipsychotic medications often suffer from significant abdominal weight gain, hypercholesterolemia and elevated blood pressure (Usher, Foster, & Park, 2006).

Evidence-based practice guidelines (Kreyenbuhl, Buchanan, Dickerson, & Dixon, 2010) include specific new recommendations that target weight gain, smoking cessation and substance abuse. Current research is beginning to target interventions to help patients manage these factors that are prevalent in this population an adversely affect their physical health. Physical health of patients with SMI has been a recent focus of research because persons with SMI have a life span that is shortened by as much as 25 years compared with the general population. Premature death in this population is caused by common medical conditions such as untreated cardiovascular diseases noted above, cancers undetected due to lack of screening, and medical conditions related to risk-taking behaviors, such as hepatitis and HIV. As many as 50% of patients with SMI have a co-occurring diagnosis of substance abuse. Patients with SMI often have difficulty consistently accessing primary care providers who attend to preventive health care needs.

From the societal perspective, SMI remains poorly understood by the general public. Stigmatizing attitudes toward persons with mental illness persist, despite the fact that most people acknowledge that the illnesses are outside the patients' control. The economic costs associated with SMI have been estimated to be in the billions and include loss of earnings as well as the direct costs associated with care (Insel, 2008). Almost a quarter of incarcerated persons have mental illnesses; it has been estimated that a third of homeless persons have an SMI (Insel, 2008). Family members continue to take on a caregiving role, with limited resources and accompanying caregiver stress and burden. Some interventions to reduce the burden and provide support to caregivers have been tested, in particular, psychoeducational programs for families (Schulze & Rossler, 2005), but widespread adoption of family interventions has been slow (Lehman et al., 1998). The National Alliance for Mental Illness, a grassroots consumer-based organization, continues to provide important support services to families.

Theoretical perspectives of treatment have shifted in the last ten years to focus less on management of SMI as a chronic condition to a focus on recovery. Recovery is defined as "a journey of healing and transformation enabling a person with a mental health problem to live a meaningful life in a community of his or her choice while striving to achieve his or her full potential" (U.S. Department of Health & Human Services, 1999). From the patients' perspectives, a recovery model of care includes the following components: an attitude of hope, empowerment, holism, strength based, peer support, respect, nonlinear progress, self-responsibility, and empowerment (President's New Freedom Commission on Mental Health, 2003; U.S. Department of Health & Human Services, 1999). The model emphasizes collaboration between patients and practitioners (Anthony & Greenley, 1993; Jacobson & Greenley, 2001). This recovery model of care will have a major impact on nursing research in the foreseeable future. Contemporary nursing practice that focuses on the support and educational needs of persons with SMIs will do so within a recovery framework. Research evidence is scant, however, on the specific interventions that will achieve the goals of recovery for patients with SMIs.

New avenues for research are emerging. Social support is important for patients with SMIs, but recent studies suggest that women in particular have reported a need for reciprocal relationships in feeling socially connected (Chernomas, Clarke, & Marchinko, 2008). Interventions recognizing the different needs of men and women with SMI are being tested (Kelly, Wellman, & Sim, 2009). Quality of life, including an emphasis on education and employment, is an important outcome of treatment in addition to symptom management. An effective therapeutic relationship with health care professionals, including nurses, remains paramount to good care (Ware, Tugenberg, & Dickey, 2004). Finally, cognitive behavioral therapy is effective with persons with SMIs (Leclerc, Lesage, Ricard, Lecomte, & Cyr, 2000).

In summary, the disabling effects of the illnesses, including impact on physical health status, are significant. There are encouraging trends, however, in the shift to a focus on recovery rather than chronicity. Community-based care, with nurses at the forefront, has an important role in achieving optimal quality of life for these patients. More research is needed to build a science of effective recovery interventions. Finally, research to address the needs of family caregivers that is feasible and cost effective and ultimately benefits patients with SMI in need to be conducted.

Linda Rose

SHIVERING

Shivering is defined as involuntary shaking of the body and is the adult human's primary defense against the cold and is characterized by a protracted generalized course of involuntary contractions of skeletal muscles that are usually under voluntary control. Thermoregulatory shivering differs from transient tremors or "shivers" associated with fear, delight, or other forms of sympathetic arousal. Shivering occurs when heat loss stimulates specific heat-loss sensors in the skin, spinal cord, and brain. Sensory impulses are received and integrated at the preoptic area of the hypothalamus. Shivering is stimulated when integrated thermosensory impulses indicate body temperature is falling below optimal "set point" range (see

Thermal Balance). The shivering center in the posterior hypothalamus is stimulated, sending impulses via anterior spinal routes of the gamma efferent system. Heat is generated by oscillation and friction of the fibrous muscle spindles of the fusimotor system. Shivering occurs in fever despite rising temperatures because the set point level is raised to higher levels by circulating cytokines and other pyrogens. The elevated set point range causes the patient's usual body temperature to be sensed as too cool and causes the warming responses known as shaking febrile chills (Holtzclaw, 2002).

The consequences of shivering for seriously ill or vulnerable patients are sometimes overlooked because they seem to be harmless compensatory warming responses. However, the aerobic activity generated by vigorous shivering activity raises oxygen consumption three- to fivefold, approximately that of shoveling snow or riding a bicycle. The resulting oxidative phosphorylation of glucose and fatty acids raises metabolic demands, but it is only approximately 11% efficient in raising body temperature. The energy expenditure of shivering may be tolerated by healthy persons who shiver for short periods, but it puts specific patient groups at risk for cardiorespiratory, metabolic, and thermal instability. Uncontrollable shivering is distressful to patients, yet it occurs frequently in situations where ambient temperatures are cool, patients are exposed, or therapies induce fever. Shivering is often recalled by patients as a negative aspect of postoperative recovery, childbirth, antifungal drug administration, blood transfusions, or other hospital experience. Nursing research has documented correlates and sequelae of shivering in an effort to determine adverse consequences in postoperative care, febrile illness, and during induced hypothermia. Intervention studies have tested efficacy of nursing measures to prevent shivering during surface cooling and febrile chills. Important to these studies has been the effort to standardize the measurement of shivering by use of a shivering severity scale, originated by Abbey et al. (1973)

Although shivering had been studied extensively by physiologists in healthy humans and animals, little clinical interest was evident until the 1970s. Abbey and Close (1979) used wraps of ordinary terry-cloth towels as insulation to protect thermosensitive regions of the skin during use of cooling blankets. Shivering during surface cooling was a significant problem treated at that time with chlorpromazine, a drug with undesirable side effects. The wrapping intervention was based on existing physiological research demonstrating dominance of the heat loss sensors on hands and feet in stimulating shivering. This landmark pilot study demonstrated that insulation of extremities controls shivering and improves comfort without drugs, even when surface cooling induces hypothermic temperatures.

Federally funded studies by nurse investigators (Abbey & Close, 1979; Holtzclaw, 1990, 1998) using more extensive temperature and electromyographic measurements further supported the usefulness of "wrapping" extremities, with theoretical perspective based on Abbey's original work. Stated briefly, insulation blunts the neurosensory stimulus of heat loss from dominant sensors, whereas larger but less thermosensitive regions of the trunk allow heat exchange without inducing shivering.

Historically, interest in postoperative shivering grew in the mid-1980s with the rise in hypothermic cardiac surgery. Research findings show the hazardous increase in oxygen consumption, carbon dioxide production, and cardiovascular exertion during postoperative rewarming from hypothermic cardiac bypass (Holtzclaw & Geer, 1995; Phillips, 1997). Clinical predictors of shivering became of interest as early prevention was indicated. The mandibular hum was detected by palpation of referred masseter vibrations over the ridge of the jaw (Holtzclaw & Geer, 1986). Widening of skin to core temperature gradients was found to predict shivering in this population, presumed to reflect the discrepancy between hypothalamic set point and peripheral temperatures that initiates shivering. Sund-Levander and Wahren (2000) found that tympanic-to-toe temperature gradients predicted shivering in neurologically injured patients during hypothermic surface cooling and that patients were more likely to shiver if cooled too quickly. This study supported the earlier contention of Abbey et al. (1973) that shivering during surface cooling could be reduced by modifying the rate of body heat loss. Studies confirm that little difference is found between pharmacological suppressants, warmed blankets, or reflective wraps in preventing shivering during perioperative rewarming (Hershey, Valenciano, & Bookbinder, 1997); however, newer forced-air warming units (e.g., Bair Hugger) and radiant lamps have been found in medical studies to maintain normothermia more effectively. Extremity wraps were found to effectively reduce febrile shivering severity and duration (see *Fever/Febrile Response*) in immunosuppressed cancer patients and persons with HIV/AIDS (Holtzclaw, 1990, 1998)

As scientific evidence grows about neuroregulatory and immunological factors influencing shivering, new avenues of study emerge. Little is known about how shivering can be controlled in emergency situations during rescue and evacuation. Few studies have examined outcomes of shivering among children. Surgery, trauma, circulatory bypass, and hypothermia have all been linked in preliminary studies to acute phase reactions that stimulate febrile shivering (Phillips, 1999). Although shivering is estimated to occur in about 10% of births during the last stage of labor, it is more frequent following epidural anesthesia (Arulkumaran, Penne, & Rao, 2005, p. 58). However, little attention has been paid to its possible other proinflammatory origins and management beyond controlling warmth in the environment (Fallis et al., 2006). Future directions in the study of shivering by nursing will likely address the biobehavioral interface of environmental stimuli, biochemical and neurotransmitter activity, energy expenditure, physics of heat exchange, and thermal comfort.

Barbara J. Holtzclaw

SIMULATION

Simulations provide an innovative teaching method to enhance the learning of students and professionals by engaging them in active learning techniques which provide feedback and allow for reflection on practice and outcomes. A definition from the National Council of State Boards of Nursing's (NCSBN, 2005) policy statement describes simulations broadly as "activities that mimic reality of a clinical environment and are designed to demonstrate procedures, decision-making and critical thinking through techniques such as role-playing and the use of devices such as interactive videos or mannequins" (Jeffries, 2005; NCSBN, 2005). In using this innovative teaching method, faculty members and staff development personnel use patient-specific information to create meaningful real-life scenarios that improves students'/nurses' comprehension of the material and situation. These scenarios vary in complexity and expected learning objectives dependent upon the level of the learner, the clinical situation they are being prepared for, and the creativity of the developer. Clinical nursing scenarios suspend disbelief of what is "real," thus creating a hands-on opportunity to practice patient monitoring and management in a risk-free environment. A variety of professions benefit from the use of simulation activities and research demonstrates enhanced learning and skill performance, increased communication, collaboration, and self-efficacy and improved patient safety and outcomes (Bambini, Washburn, & Perkins, 2009; Kaakinen & Arwood, 2009;

Radhakrishnan, Roche, & Cunningham, 2007; Rhodes & Curran, 2005). The next section will explore the historical, societal, and economic issues affecting the contemporary practice of simulation in nursing.

Historically, simulations have been used for training astronauts, pilots, military personnel, and physicians. Only recently have the decreased cost of human patient simulators (HPSs) and software allowed for their increased use in nursing. Societally, the demand for patient safety has encouraged nurse educators to explore innovative techniques to better prepare nursing students and staff for the complexities of the twenty-first century health care environment (Kohn, Corrigan, & Donaldson, 2001; National League for Nursing, 2008). The Institute of Medicine's 2003 Report, *Health Professions Education (HPE): A Bridge to Quality*, concluded that nurses, doctors, and other allied health professionals lack the education and training necessary to meet health care needs suggesting that "distance learning technology, standardized patients, and clinical skills testing technology also hold potential for revolutionizing HPE . . . offering students an opportunity to customize their learning and progress at their own pace . . ." (Institute of Medicine, 2003b, p. 90).

Societally, many factors have led to the increased use of simulation as an innovative teaching method in academic and health care institutions including: the growing shortage of nurses and nursing faculty (American Association of Colleges of Nursing, 2009), an increased interest in nursing as a career (Tanner, 2006a), and the growing complexity of the health care environment, with increased technology and more highly acutely ill patients. Taken together, the result in academe has been limited student exposure to regular hospital situations, decreased opportunity to practice and maintain skills, and less availability of specialty area experiences. Clinical simulation is being used to meet this gap in opportunity and to enhance teaching students the critical thinking, clinical decision making, and communication skills they need to function. In addition, nursing students need enhanced practice in areas such as planning, implementing, and managing care for multiple patients, prioritization, and delegation of care all identified as education–practice gaps with newly hired graduate nurses (Nursing Executive Center Nursing School Curriculum Survey, 2007). The NCSBN reported that states have enacted regulation changes to allow simulation as substitution for clinical learning activities with approval of between 10% and 25% of simulation time as clinical experience (Jeffries, 2009).

On the health care institution side, the luxury of long, mentored transition experiences for new graduate nurses, nurses returning to practice, or nurses training in different specialty areas has disappeared. Better graduate nurse retention and job satisfaction was found in interactive nurse residency programs that incorporated simulation (Anderson, Linden, Allen, & Gibbs, 2009). Although clinical simulation will never replace actual student and staff contact with real patients, it is rapidly earning a place in nursing education and professional development as a valuable supplement. The potential to maximize faculty resources and better prepare students before their entry to the clinical setting will make student and faculty time in clinical more valuable and cost-effective.

The past few years have seen an unprecedented use and proliferation of simulation for nursing education, research, and staff development. The increased use of HPS is related to the economics of the situation, namely, lower cost of equipment/software, increased national funding for nursing education using technology and innovation, and the acceptance of this teaching method by leaders in nursing (Nehring, 2008, p. 109). Contemporary practice of simulation in the health care field include uses in military and medical education in areas such as emergency room training and anesthesia crisis management or trauma rotation and first responder cardiac care training. In nursing, simulation has been used to teach critical care, cardiopulmonary resuscitation, and clinical decision making and to provide more consistent experiences for specialty areas such as obstetrics and neonatal nursing (Bambini et al., 2009; Cioffi, Purcal, & Arundell, 2005; Kappus, Leon, Lyons, Meehan, & Hamilton-Bruno, 2006). It has been used to examine patient safety in relation to hand washing, medication administration, and CPR response as well as in specialty areas such as labor and delivery (Broussard, 2008; Gantt & Webb-Corbett, 2010; Hamman et al., 2010; Lighthall, Poon, & Harrison, 2010; Sears, Goldsworthy, & Goodman, 2010). Simulation also offers opportunities to evaluate and assess student and staff skills providing options for remediation and life-long learning (Greenawalt & Brzycki, 2007). The active learning aspect of simulation engages learners and leads to greater retention of the material learned. The integration of psychomotor, communication, clinical judgment and critical thinking skills enhances self-efficacy, although research provides inconsistent results in the measurement of these outcomes (Bambini et al., 2009; Brannan, White, & Bezanson, 2008; Chronister, 2008; Rhodes & Curran, 2005). Using technology, informatics, and faculty innovation, simulation involves faculty/staff development guidance and feedback during debriefing as well as opportunities for reflection enhancing the competency of nursing students and practicing nurses to provide safe patient care.

With the increased use of HPSs, "best practices" have been proposed for use with novice nursing students as "1. Well-articulated learner outcomes; 2. Clear connection to course/clinical objectives; 3. Established ongoing training and supervision of faculty and staff members and participants; 4. Collaboration with student and faculty member in planning, implementation, and evaluation; and 5. Debriefing session after each HPS experience" (Bremner, Aduddell, Bennett, & VanGeest, 2006, p. 173).

There are many education learning theories that support simulation education, to name a few: adult, social cognitive, experiential, brain-based, constructivism, and novice-to-expert learning theories (Rodgers, 2007, pp. 71–109). In fact, one of the criticisms of simulation research is a lack of theory-based studies. Rourke, Schmidt, and Garga (2010) reviewed 47 manuscripts and found only 10% of the studies used a theory of learning. Similarly, Kaakinen, and Arwood (2009) reviewed 120 simulation manuscripts to differentiate the use of simulation as a teaching method versus a way to design learning opportunities. In 94 of those manuscripts, simulation was described as a teaching method/strategy; 16 of those had "learning" as the purpose for simulation design, but only two considered learning as a cognitive task (p. 11). The student learning was not considered as a cognitive/social process occurring through a planned experience or how the brain acquired and learned concepts (Kaakinen & Arwood, 2009, pp. 12 and 17).

One of the major theoretical frameworks examined with relationship to simulations is Bandura's social cognitive theory, specifically, self-efficacy. Although some studies have reported a decrease in anxiety and increase in self-confidence with simulation participation, Leigh (2008, p. 11) found nursing research in these areas lags behind other disciplines, especially examining the relationship between improved self-efficacy and students' clinical performance and patient safety.

Two frameworks exist for studying nursing simulations: Jeffries and Rodgers' (2007) Nursing Education Simulation Framework, which takes into account learning and cognition when creating simulations, and Campbell and Daley's

(2009) Framework for Simulation Learning in Nursing Education, which combines learning (Fink, 2003), ecological, and nursing theories such as caring (Eggenberger & Keller, 2008), reflective practice (Tanner, 2006b), and vigilance (Meyer & Lavin, 2005). Research using these frameworks may provide more rigorous testing of the connection between simulation, learning, and clinical practice.

In summary, there are many advantages to the use of simulation for the education of new nurses and continuing education of practicing nurses. Simulation provides an opportunity to practice teamwork to enhance critical thinking skills, clinical performance, and competence. There are potential program and agency assessment advantages, allowing for testing of student and staff competencies in a controlled environment with reproducible and predictable results, time-stamped data output, and evaluation.

Some of the challenges include the financial constraints of equipment purchase, building renovations, and staff/educator/student training and resources. Although federal and state funds are available, schools and agencies are still looking for unique ways to raise funds, including grants, advisory boards, and partnerships (Appel, Campbell, Lynch, & Novotny, 2007; Harlow & Sportsman, 2007).

Research and further work is still needed in the areas of (1) creating evidenced-based clinical simulation scenarios; (2) enhancing the use of theory-based research for the study of the effect of simulation on student, nurse, and patient outcomes; (3) developing tools for use in evaluating simulations (Harder, 2010) using examples from others who have tested various methods of evaluation (Gantt, 2010; Glavin & Gaba, 2008); and (4) using simulations to teach patient safety behaviors to nursing students (Gantt & Webb-Corbett, 2010) and to reinforce it with nursing staff (Kuehster & Hall, 2010).

Suzanne Hetzel Campbell

SLEEP SCIENCE

Sleep is a fundamental lifestyle behavior that fits with nursing human health ecology perspectives, that is, people in fit with their environments. Sleep behavior is seen as a function of three interactive components: (1) a sleep drive that modulates alertness/sleepiness as it waxes and wanes in concert with the relative balance of brain neurochemicals, (2) a circadian feature that functions in synchrony with the 24-hour light–dark environmental cycle, and (3) a behavioral component by which individuals can willfully facilitate or dampen sleepiness driven by the other components. Thus, sleep is a neurobehavioral phenomenon such that brain functions, either physical or mental, can disrupt sleep. When reduced, absent, or disturbed, sleep has numerous health-related consequences, including impaired attention, memory, and problem solving as well as physical performance, altered immune system function, and tissue healing, and in some cases it may herald early onset of psychiatric impairment, particularly major depression. For individuals and society, the burden of poor sleep is substantial; stemming from vulnerabilities to injury accidents, absences from work, medical problems, provider visits, and hospitalizations.

Although the study of sleep regulation began to emerge in the 1920s, it was not until about the 1950s that sustained study of sleep began to escalate appreciably and this has continued particularly over the past 40 to 50 years. In medical sleep science, foci have often been on sleep-related disorders such as sleep apnea and narcolepsy. However, most often studied in nursing science is insomnia, the commonest sleep difficulty and defined as self-report of poor quality or amount of sleep or awakening from sleep without feeling refreshed. Insomnia can be episodic and temporary (often associated with stressful social circumstances or personal or environmental interference factors) but is most troublesome when enduring or frequent (referred to as chronic and potentially related to an inherent propensity toward enhanced arousal). Insomnia includes features of difficulty falling asleep, waking up often during usual sleep episodes, or premature awakening with inability to fall back to sleep. Environmentally, good quality sleep (pattern and duration) is most evident when sleep is initiated on the decline of the circadian body temperature curve during growing environmental darkness and when sleep episodes occur consistently over the same span of hours on the 24-hour light–dark cycle. Behaviorally, good quality sleep is promoted by sleep initiation after a preparation ritual and in a relaxed and drowsy state. Sleep is seen to become less stable with age, leading to more frequent awakenings during the night, which are problematic only if sleep is difficult to resume.

Sleep can be assessed physiologically using polysomnography (i.e., brainwave, muscle tension, and eye movement activity monitoring) to reveal a series of stages and patterns, or by body activity monitors that distinguish sleep from waking. Sleep also can be assessed behaviorally (by direct observation) or by self-reported perceptions (retrospective recall or global impressions as histories or concurrent reporting in diaries or logs). Somnographically, sleep is seen to begin with transitional signs, progressing into a light stage then into deep (slow wave) sleep, followed by a period of rapid eye movement sleep to complete one sleep cycle, taking about 60 to 90 minutes. Consequently, a full night of sleep consists of three to six cycles, depending on total sleep duration. Various sleep measures have limitations, including physiological measures that are time consuming, require expensive technology, and have the potential to interfere with natural sleep. Behavioral observations are tedious, time consuming, and potentially inaccurate. Self-report methods are subject to preferred answers and the propensity to report negative impressions, indiscriminately. Moreover, perceptions of sleep do not always match physiological indicators, making interpretation of the factors influencing sleep complex and dependent on how sleep quality is assessed.

Knowledge about sleep comes from a variety of research approaches. Experimentally and mainly using animal models, physiological sleep/wake regulation and genetics are studied. Epidemiologically, sleep patterns are studied across populations in the context of culture, age, or gender. Descriptively, studies are done to understand the function of and need for sleep and to gain insights into factors predictive of poor sleep. Many studies are done in the context of conditions thought to be stressful, for example, disease, illness, pregnancy, menopause, relocation, or environmental catastrophes. Nursing scientists most often seek to understand how sleep, or more precisely sleeplessness, is related to disease and illness, what can be done to promote sleep and how sleep is affected by environments and life contexts.

Sleep science generated by nursing scientists largely is built on the premise that personal stress, disease/illness, and sleep/wake quality are interactive. The notions that illness/disease and hospitalization/institutionalization interfere with usual sleep/wake behavior are prominent. For example, nursing scientists have developed programs of sleep research in the context of renal failure (Parker, Bailey, Rye, Bliwise, & Van Someren, 2008), heart failure (Redeker, 2008), cancer (Berger, 2009), sleep apnea treatment adherence (Weaver & Sawyer, 2010), juvenile arthritis (Ward et al., 2010), and fibromyalgia (Landis, Lentz, Tsuji, Buchwald, & Shaver, 2004) or have expanded research to include sleep, for example, with functional bowel disorders (Heitkemper, et al., 2005). In addition, evident are programs of nursing science research related to women's reproductive status transitions in which sleep changes are known to manifest, for example (Lee, Baker, Newton, & Ancoli-Israel, 2008), during pregnancy and postpartum and menopausal transition (Woods & Mitchell, 2010). Also, a variety of nursing scientists and clinicians have studied sleep in older adults (Richards & Sawyer, 2010) and in the context of living in long-term care facilities (Cole et al., 2009) and being in intensive care units (Tembo & Parker, 2009).

The vast majority of nursing science remains descriptive, and less is addressed to therapies that promote sleep, for example, behavioral therapies or environmental manipulations. Studies of therapeutics related for improving sleep are emerging and consistent with the nursing mission to "assist people to lead their lives in the context of disease (actual or threatened) or major life transitions." In the sleep field, the use of pharmacological interventions for improving sleep is deemed limited by potential side effects and reduced sleep promotion effects over time. Therefore, behavioral therapies are seen to be an important adjunct or alternative to long-term pharmacological interventions for insomnia. The development and study of cognitive and behavioral interventions, such as sleep cognitive behavioral therapy (S-CBT), mindful relaxation, stimulus control, sleep restriction, and sleep hygiene techniques are prominent, often with combinations of these techniques to strengthen sleep outcomes.

Because behavioral change for health-promoting self-care is core to nursing science and practice, sleep behavioral therapeutics represents this dimension. Although fewer interventional than descriptive nursing science programs of research are evident, tests of sleep therapeutics are emerging. As an example, nursing scientist Berger (2009) and her team (Barsevick et al., 2010), for improving sleep and fatigue in women undergoing breast cancer adjuvant chemotherapy, have seen positive results from a personalized plan intervention that incorporates modified stimulus control, modified sleep restriction, relaxation therapy, and sleep hygiene dimensions. Another example is Stremler et al. (2006), who have reported improved sleep in first time mothers using an intervention of a 45-minute meeting with a nurse to discuss sleep information and strategies, an 11-page booklet to take away, and a weekly phone contact for 5 weeks to reinforce information and help problem solve.

In summary, sleep as a health-related lifestyle behavior influenced by behavioral and environmental therapeutics fits well with the essence of nursing practice. In the future, nursing science will benefit from (1) deriving stronger, validated theoretical/conceptual perspectives of sleep quality, sleeplessness, and sleepiness and its relationship to overall health status and function; (2) creating and testing novel therapies based on validated theoretical perspectives; and (3) understanding better the complexity, burden, and cost (of either poor sleep patterns or interventions). It is imperative for the development of nursing sleep science that sustained study is done to predict those at high risk for negative consequences within vulnerable populations, particularly underadvantaged individuals, the very young, the older adults, and the chronically ill; those suffering from sleep disorders for which behavioral treatments are prominent (e.g., insomnia); and those in high-risk environments (e.g., hospitals, high life-strain situations).

Because sleep is a behavior responsive to behavioral interventions, more study is needed, which clarifies timing and exposure (dose) responses, titration, personalized or tailoring dimensions, individualized response types and the factors affecting behavioral choice and adherence, and the effects of improved or optimal sleep on health outcomes such as tissue healing or cognitive/emotional improvement. From a human ecological perspective, benefits would be accrued from testing more interventions with relevant behavioral modification in concert with modulation of environments or contextual factors. The application of emerging wearable technologies for monitoring and biobehavioral methods that combine physiological and perceptual measures will do much to advance our knowledge on the importance of sleep and its importance to symptom management, illness/disease prevention, and health promotion.

Joan L. Shaver

SMOKING CESSATION

Forty-six million (18.4%) American adults continue to smoke, despite evidence that tobacco is responsible for 443,000 deaths in the United States each year and is the single most preventable cause of death. During 2000–2004, the Centers for Disease Control and Prevention (CDC) estimated health care costs associated with smoking or smoking-attributable diseases at $96 billion. Lost productivity costs exceeded $97 billion (CDC, 2010e). Of concern is the increase in smoking prevalence in adolescents, with 4,000 children and adolescents smoking their first cigarette and 1,200 becoming regular cigarette smokers every day. Seventy percent of the approximately 45 million smokers in the United States want to quit, with about 44% trying each year. Only 4% to 7% will be successful (Fiore et al., 2008).

Smoking cessation, or smoking abstinence, differs from a quit episode, which is considered as 24 hours of continuous abstinence (Ossip-Klein et al., 1986). Smoking cessation is defined as the discontinuation of a smoking behavior. The behavior is characterized as dynamic and is often accompanied by periods of slips and relapses. Smoking cessation and tobacco use are important areas of research for nurses. Nurses are in frequent contact with smokers, and their high credibility allows them to represent key smoking cessation interventionists, capable of implementing effective cessation programs (Fiore et al., 2008).

Treating Tobacco Use and Dependence Clinical Practice Guideline was first published in 1996 by the U.S. Public Health Service Agency for Healthcare Research and Quality (AHRQ), and revised in 2000. The 2008 update emphasizes tobacco dependence is a chronic medical condition, requiring repeated interventions and multiple quit attempts (Fiore et al., 2008). The major strategies to managing tobacco dependence are the "5 A's": *ask* the patient about tobacco use, *advise* tobacco cessation, *assess* willingness to quit, *assist* with the quit attempt, and *arrange* for follow-up to prevent relapse. Tobacco use needs to be confirmed each visit, patients should receive a brief intervention at every visit. All tobacco users attempting to quit should receive one of the seven AHRQ-recommended first-line pharmacotherapies for smoking cessation.

O'Connell (2009) reviewed theories used in nursing research on smoking cessation. She reported 65 of 137 studies (47%) used one or more formal theories. The most frequently used theory was Prochaska and DiClemente's (1983) Transtheoretical Model (Prochaska et al., 1994) followed by Bandura's (1977, 1977) self-efficacy theory. The most widely used concepts included nicotine dependence, social support, high risk situations, affect mood, and influence of diagnosis. O'Connell noted the guideline (Fiore et al., 2008) does not mention stage of change, although it does mention several concepts frequently used in nursing research. She also reported the absence of biobehavioral models, although research published by nurses in nonnursing journals was not reviewed. Theory-driven research contributes to the organization and interpretation of findings, aiding policy makers lobbying for changes in smoking-related laws and health care policies.

Written guidelines with recommendations for abstinence outcome measurements were developed by a subcommittee of the Society for Research on Nicotine and Tobacco (Hughes et al., 2003). Prolonged abstinence, defined as sustained abstinence after an initial two week grace period, is the recommended as the primary outcome measure. A

7-day point prevalence is also recommended as a secondary measure. Failure, defined as seven consecutive days of tobacco use or using at least 1 day of two consecutive weeks includes any type of tobacco. Nontobacco nicotine use (i.e., nicotine replacement therapy) is excluded (Hughes et al., 2003).

Outcome measures also include biochemical verification of tobacco abstinence. A limitation in smoking cessation intervention research is the lack of biochemical verification to confirm smoking status. Cotinine, the major metabolite of nicotine, has excellent specificity for tobacco use except in persons using nicotine replacement therapy. Cotinine can be measured in plasma, saliva, and urine. Carbon monoxide (CO), a by-product of cigarette smoke, can be measured in expired air. Unfortunately, CO has a shorter half-life of 2 to 4 hours and is rapidly eliminated, whereas cotinine may be detected for several days after tobacco use. However, CO assessments are often used to confirm abstinence in studies where nicotine replacement therapy is ongoing. Recommendations include biochemical verification be used in most or all studies of smoking cessation among special populations, including adolescents, pregnant women, and medical patients with smoking-attributable disease. Biochemical verification provides added precision to participant's self-reports (Society for Research on Nicotine and Tobacco Subcommittee on Biochemical Verification, 2002).

Wells and Sarna (2006) published a listing of literature focusing on nursing research in smoking cessation since 1996, when the guidelines were first published. They identified 175 databased articles focused on smoking cessation and involved nurses. Publications steadily increased each year, with more than 40 published in 2005. The minority (35%) were published in nursing journals, with the *Journal of the Academy of Nurse Practitioners* having the most (>4). Research included experimental (38%), quasi-experimental (24%), and descriptive [quantitative (25%), qualitative (8%)], among others.

Froelicher, Doolan, Yerger, McGruder, and Malone (2010) examined a smoking cessation intervention randomized clinical trial implemented as a community participatory research project among African Americans in an urban low-income neighborhood. A trained community health nurse delivered a 5-week smoking cessation program, based on established guidelines, to both the control and intervention groups. The intervention group also received a community codeveloped industry and media intervention. Smoking cessation reported at 6 months was 11.5% (control) and 13.6% (intervention) and at 12 months was 5.3% (control) and 15.8% (intervention). Salivary cotinine confirmed quit status. The findings were not significant because of the small sample sizes. The authors note failure to recruit and enroll a sufficient number of participants resulted in statistical insignificance. Lessons learned were discussed to help future investigators and community workers interested in community based participatory approaches (Froelicher et al., 2010).

Smith and Burgess (2009) examined the efficacy of a minimal versus intensive intervention for smoking cessation delivered by a research nurse for patients hospitalized for either coronary artery bypass graft or acute myocardial infarction. The minimal intervention included personalized quit advice from the nurse and physicians as well as two pamphlets. The intensive intervention also included 45 to 60 minutes of bedside counseling, take-home materials, and seven nurse-initiated counseling calls, focusing on relapse prevention, for 2 months after discharge. Stratified randomization was used for the intervention assignment ($n = 276$). Self-reported abstinence was higher in the intensive intervention than the minimal intervention at 3 months (76%, $p = 0.009$), 6 months (67%, $p = 0.003$), and 12 months (62%, $p = 0.007$). Abstinence was confirmed via proxy confirmation at 12 months. Continuous 12-month abstinence was 57% in the intensive group versus 39% in the minimal group

($p < 0.01$). The authors concluded that intensive smoking cessation programs are effective in patients admitted for coronary artery bypass graft and acute myocardial infarction, and future research should focus on disseminating findings into standard practice for cardiac patients (Smith & Burgess, 2009).

Smoking continues to be pronounced in the less educated and poor (CDC, 2009). Efforts to promote cessation and abstinence in these individuals have, to date, been relatively unsuccessful. Their lack of engagement in preventive health care services may, in part, be due to barriers to access and lack of information about prevention and available cessation resources (U.S. Department of Health and Human Services, 2000). Although the evidence-based AHRQ clinical practice cessation guideline has been developed and updated (Fiore et al., 2008), its testing among vulnerable populations remains limited. The guideline deserves further examination among minority groups, pregnant and postpartum women, HIV+ persons, and smokers who are poor and often experiencing a comorbid condition, such as cancer or chronic obstructive pulmonary disease.

Gretchen A. McNally
Mary Ellen Wewers

SMOKING/TOBACCO AS A CARDIOVASCULAR RISK FACTOR

Over the past four decades, smoking has declined in the United States by 50% among adults 18 years and older. Although this decline has certainly impacted the rate of reduction in cardiovascular disease and other chronic conditions, the annual death toll continues to approach 435,000 individuals in the United States, and worldwide more than 5 to 6 million deaths occur annually (American Heart Association, 2010; Jha, 2009). The World Health Organization projects that by 2030 smoking will kill at least 10 million individuals annually, making it the leading cause of death worldwide (Peto & Lopez, 2001).

Smoking is a complex addictive disorder that causes physiological and psychological addiction. Nicotine, which has both stimulating and tranquilizing effects, leads to addiction. Smoking is also an over learned habit which is associated with many aspects of daily life such as driving in a car, eating a meal, or drinking caffeine. Finally, it is used as a coping mechanism to help individuals deal with emotions such as stress, boredom, frustration, and anger. The success of interventions to help individuals quit smoking must focus on the complexity of the behavior, including nicotine addiction, the psychosocial influences, and the habit. Although smoking remains a complex condition requiring both pharmacological and behavioral approaches to helping an individual with cessation, epidemiologic data suggest that 70% of all smokers in the United States want to quit and approximately 44% report they attempt to quit annually (Fiore et al., 2008). The annual smoking cessation rate of 4% to 7% associated with office practice interventions may discourage clinicians and patients; however, it is important that health care professionals not become complacent about this behavior. A small percentage drop in cessation rates has large population benefits. Recent approaches to treating both tobacco use and dependence recognize that smoking is a chronic condition requiring multiple attempts until success is reached. It is encouraging that two thirds of smokers who relapse want to try and quit again within 30 days (Fiore et al., 2008). As the largest group of health care professionals, nurses play a prominent role in helping individuals to quit smoking.

The prevalence of smoking in the United States is now 46,000,000 (24,800,000 males and 21,100,000 females), representing 20.6% of the adult population, or one in five adults (American Heart Association, 2010). Smoking is highest in non-Hispanic American Indians or Alaska natives, and lowest in non-Hispanic Asians. The prevalence of smoking varies considerably from state to state and is highest in West Virginia (26.5%) and lowest in Utah (9.3%) (Centers for Disease Control, 2009). Smoking prevalence is highly dependent on the success of tobacco-related legislation and policies within states and is often higher in states where tobacco is grown. Although the time of initiation of smoking is 14 to 15 years, the percentage of students ever trying cigarettes declined from 70.4% in 1999 to 50.3% in 2007 (American Heart Association, 2010). Prevention strategies within schools and a greater focus on tobacco legislation have likely led to this decline.

Smoking affects almost every tissue and organ in the body and is associated with high rates of common diseases such as chronic obstructive pulmonary disease, most cancers, and cardiovascular disease. Smoking is a major risk factor for coronary heart disease, peripheral vascular disease, aortic aneurysm, and stroke. The relative risks are greatest for those with peripheral vascular disease and lowest for stroke, with intermediate relative risks in those with coronary heart disease and aortic aneurysm. In addition, smoking increases the risk of coronary thrombosis and sudden cardiac death. The risk of coronary heart disease, the leading cause of death in those less than 45, relates to all levels of cigarette smoking, including those individuals smoking less than 5 cigarettes per day (Burns, 2003). Finally, smoking reduces the life span of males by 13.2 years and of women by 14.5 years (American Heart Association, 2010).

Smoking has important adverse pathophysiological effects on the vascular system. Most of the toxic effects of smoking are found in the 4,000 compounds in cigarettes. Although carbon monoxide and nicotine are often thought to be the worst culprits associated with smoking, toxins cause damage along different pathways leading to vascular disease (Lu & Creager, 2004). Smoking adversely affects the following: (1) endothelial system, (2) lipoprotein metabolism, (3) blood coagulation, (4) platelets, and (5) oxygen supply and demand (Miller, 2008).

The hazardous effects of smoking are also found for those exposed to tobacco. Nonsmokers exposed to environmental tobacco smoke suffer an increased 30% risk of developing ischemic heart disease. On the basis of measurements of urinary cotinine, the National Research Council (1986) estimates that environmental tobacco exposure is equivalent to actively smoking 0.1 to 1.0 cigarettes per day. An estimated 35,000 ischemic heart disease deaths annually are believed to be due to the effects of environmental tobacco exposure which includes both sidestream (burning cigarettes) and mainstream (smokers’ exhalation) smoke (Glantz & Parmley, 1991).

Smoking also imposes a significant social burden due to the high costs of tobacco-related illnesses. The health care expenditures associated with smoking are estimated at $96 billion in direct medical costs and $97 billion in lost productivity (American Heart Association, 2010).

In 2008, the U.S. Department of Health and Human Services updated the Clinical Practice Guideline on Treating Tobacco Use and Dependence. Published initially in 1996, the guideline reviewed over 8,700 studies on smoking conducted from 1975 to 2007. On the basis of strong evidence from randomized controlled trials, this guideline recommends the following: (1) brief interventions of 3 minutes are recommended for all current smokers, those unwilling to make an attempt, and former smokers who have recently quit; (2) both pharmacotherapies and behavioral counseling work best when combined; (3) the 5 “A’s” of asking about smoking, advising to quit, assessing willingness to quit, assisting those ready to make an attempt, and arranging for follow-up continue to be advocated; (4) medications should be offered to everyone except those populations with lack of evidence (e.g., pregnant women, smokeless tobacco users, light smokers [<10 cigarettes per day], and adolescents); (5) state quit lines and the 1–800-QUIT-NOW are effective compared with no or minimal intervention; and (6) having tobacco covered as a benefit is likely to increase the rate of those who receive treatment, make a quit attempt, and attain abstinence (Fiore et al., 2008). Evidence continues to indicate that in health care settings smoking cessation is enhanced when multiple health care professionals offer the same message about the importance of cessation, high intensity counseling greater than 10 minutes with a total duration of 30 minutes or more, multiple follow-up sessions (four to eight times), and provide multiple formats such as self-help materials combined with individual counseling and pharmacotherapy (Fiore et al., 2008).

Seven medications approved by the Food and Drug Administration are now being recommended as effective pharmacotherapies for use with smoking cessation, including five nicotine replacement therapies, buproprion chloride (Zyban, Wellbutrin), and varenicline (Chantix). Cessation rates are more than double compared with placebo when any medication is used to helped smokers quit, and combining medications may further increase success (Fiore et al., 2008). Nurses have a key role to play in not only educating individuals about pharmacotherapies but also providing follow-up as unless carefully prescribed use is often ineffective (Sarna et al., 2009).

Nurses may contribute significantly to both prevention and tobacco cessation. Although 13.9% of nurses continue to smoke, this rate has declined significantly over the last three decades, increasing the likelihood that more nurses will intervene with individuals to help them in the quitting process (Sarna et al., 2009). Because of their key role and the health hazards of smoking, nurses who smoke must seek support for quitting. In addition, studies indicate that having cessation training and believing that offering treatment is a professional responsibility increases the likelihood that health care professionals will intervene to fully provide the 5 "A's" that support cessation (Fiore et al., 2008). A large number of nurses intervene to ask and assist individuals with cessation (73%), but far fewer intervene to offer pharmacotherapies (24%), community resources (22%), or a quit line (10%) (Sarna et al., 2009). Nurses are in unique settings such as schools whereby prevention curricula may be offered, home health settings where interventions may be provided, and in large organizations where they can advocate for significant changes in public policy such as increasing tobacco taxes.

Nurse investigators have played a key role in developing and testing efficacious interventions in various treatment settings such as hospitals and clinics. Their work most notably increases the odds ratio that a patient will quit by approximately 1.28 (Rice & Stead, 2009). Hospital-based nursing interventions have shown considerable success when highly systematized for both cardiovascular patients and those with various medical and surgical diagnoses (Froelicher et al., 2004; Miller, Smith, DeBusk, Sobel, & Taylor, 1997; Rigotti, Munafo, & Stead, 2008; Smith & Burgess, 2009).

Future research is needed by nurse investigators who ultimately care for patients in multiple health care settings. Such research includes testing successful interventions in disadvantaged populations, using teachable moments in settings such as emergency rooms to advocate for cessation, replicating hospital-based interventions online, and examining further training with the 5 "A's" to determine if greater multicomponent strategies (pharmacotherapies, self-help materials, quit-line referrals, etc.) might be improved.

In summary, the smoking decline over the past three decades offers hope that this addictive behavior may someday become a distant memory. However, continued work in the United States and in developing countries is needed to achieve this goal. Nurses and other health care professionals are in key positions to advocate in clinical practice and community settings to reduce the burden associated with the leading cause of preventable death and disability worldwide.

Nancy Houston Miller

SNOMED Clinical Terms

SNOMED Clinical Terms (CT) is a comprehensive health care terminology organized into 18 hierarchies including the following of key relevance to nursing: (a) clinical finding/disorder, (b) procedure/intervention, (c) environment or geographic location, (d) social context, (e) event, and (f) staging and scales (International Health Terminology Standards Development Organization [IHTSDO], 2010). SNOMED CT evolved from the convergence of SNOMED (Systematized Nomenclature of Medicine) and National Health Service Clinical Terms through a collaborative process initiated in 1999.

Nursing research in the early 1990s suggested that although SNOMED had terms of utility to nursing, further expansion was required (Henry, Holzemer, Reilly, & Campbell, 1994; Lange, 1996). Subsequently, SNOMED CT integrated content from a variety of nursing language systems. These include North American Nursing Diagnosis Association International (2008), Nursing Interventions Classification (Dochterman & Bulechek, 2004), Nursing Outcomes Classification (Moorhead, Johnson, & Maas, 2004), Clinical Care Classification (Saba, 2007), Omaha System (Martin, 2004), and Perioperative Nursing Data Set (AORN, 2008)

Nurse researchers also influenced the SNOMED CT reference terminology model that specifies how atomic concepts can be combined to construct a more complex term. For example, impaired caregiver coping can be constructed from atomic concepts (impaired, coping, and caregiver) from the findings and social context hierarchies. Research occurred with attention to the evolving International Standards Organization standard on a reference terminology model for nursing (Bakken, Coenen, & Saba, 2004) and the axes of the International Classification of Nursing Practice (International Council of Nurses, 2010). In particular, studies highlighted the need to represent the “who” of nursing diagnoses and interventions (e.g., patient, family, group, caregiver), actual versus potential problems, and a broad array of nursing actions (e.g., teaching, administering, coordinating) (Bakken et al., 2002; Hardiker, Bakken, Casey, & Hoy, 2002; Moss, Coenen, & Mills, 2003).

Although initially the intellectual property of the College of American Pathologists (Côté, Rothwell, Palotay, Beckett, & Brochu, 1993), in 2007 SNOMED CT was transferred to the SNOMED Standards Development Organization through the creation of the IHTSDO. As one of nine charter members of the IHTSDO, the United States distributes SNOMED CT through the National Library of Medicine’s Unified Medical Language System license. Thus, SNOMED CT is now broadly available for use in the United States.

SNOMED CT has grown to more than 300,000 concepts. An IHTSDO Nursing Special Interest Group reports to the Innovation and Implementation Committee and provides advocacy for nursing. In 2010, the International Council of Nurses—the developers of the International Classification of Nursing Practice—and the IHTSDO signed a collaboration agreement to further advance terminology harmonization. These policy efforts as well as additional research are essential to integration nursing concepts into computer-based systems such as electronic health records to support nursing practice and practice-based evidence generation.

Suzanne Bakken

SOCIAL SUPPORT

The concept of social support is a complex one that has many dimensions or constructs. Dimensions of social support include the *function* (e.g., emotional support, tangible aid), *source of support* (e.g., coworker, supervisor, spouse), and *structure of support* (e.g., network, frequency of social interactions; Hobfoll & Vaux, 1993). Cohen and Wills (1985) described the function of social support as emotional, instrumental, informational, and social companionship. Emotional support is to provide one with love and care. On the other hand, instrumental support is to provide one with financial aid, material resources, and services, whereas informational support (appraisal support) is to assist one to understand and deal with problematic situations, and social companionship is to spend good time (recreational activities) with others (Cohen & Wills, 1985). The bulk of social support studies were conducted during the 1980s and early 1990s. This might be attributed to the increased interest of researchers in occupational stress and its management in the late 1970s. Social support was among the approaches that were investigated in relation to dealing with stress.

Research indicates that nursing is a stressful profession. Occupational stressors, if not managed successfully or effectively, could affect the psychological as well as physiological capacities of the individual. However, some employers might consider the stress of their employees as a personal psychological state and ignore its consequences on the organizations and the physiological and behavioral functions of the employees. The direct and indirect effects of stress in terms of job dissatisfaction, low job performance, turnover, and absenteeism motivate researchers to investigate variables such as social support that might offset or reduce the impact of occupational stress and enhance the morale and satisfaction of the staff.

The two models of social support—the direct effect and the stress buffering—have been widely discussed (Cohen & Wills, 1985). The direct-effect model indicates the effect of social support on certain variables such as job performance and job satisfaction regardless of the level of stress, whereas the stress-buffering model indicates the effect of social support on certain outcomes through decreasing the level of stress. Selected literature of the direct and buffering effects of social support on organizational outcomes among nurses is discussed below.

The literature revealed the consistency for the direct effect of social support on outcomes such as burnout, job performance, job satisfaction, and intention to stay. Emotional social support has been found to associate negatively with stress and burnout (Bartram, Joiner, & Stanton, 2004; Hare, Pratt, & Anderaw, 1988). AbuAlRub (2004) and Amarneh, AbuAlRub, and Abu Al-Rub (2009) found that as social support from coworkers increased, job performance increased. AbuAlRub, Omari, and Al-Zaru (2009) showed that as social support from both coworkers and supervisors increased, job satisfaction increased among hospital nurses.

McCloskey (1990) found that social integration (social support from coworkers) was correlated positively with job satisfaction, work motivation, commitment to the organization, and intention to stay. Social integration also was found to buffer the bad effects of low autonomy. The autonomy–integration interactions for intent to stay and organizational commitment at 6 months and job satisfaction at 12 months were statistically significant. The positive association between social integration and job satisfaction was also supported by the studies of Bartram et al. (2004), Chu, Hsu, Price, and Lee (2003), and Ko and Yom (2003). AbuAlRub, Omari, and Abu Al Rub (2009) supported the findings of the relationship between social support and intention to stay at work among hospital nurses. They showed that as social support from both supervisors and coworkers increased, intention to stay at work increased. Ellenbecker (2004) also found a positive association between retention and group cohesion. That is, as group cohesion increased, retention increased too.

On the other hand, the literature showed inconsistent results for the buffering effect of social support. For example, the results of Stewart and Barling (1996), who examined the effect of social support on the stress–performance relationship, indicated that only informational social support moderated or buffered the subjective stress–performance relationship. That is, increased informational social support reduces the negative impact of stress on job performance. AbuAlRub, Omari, and AbuAlRub (2009) showed that social support form supervisors moderated or buffered the stress–satisfaction relationship.

AbuAlRub (2004) found that social support did not buffer the relationship between job stress and job performance; that is, as perceived job stress increased, nurses with high social support in the workplace did not perform better than nurses with less support. Fong (1990) examined the stress–support–burnout relation among nursing faculty. The results showed that (1) support from supervisors and work peers was positively correlated with all dimensions of burnout, and (2) support from supervisors and coworkers did not moderate or buffer the stress–burnout relation; that is, as stress increased, the individuals with high support did not experience less burnout than those with less support.

Further research using different designs and methodologies is needed to test the buffering models of social support. On the basis of the research studies that provide evidence for the direct and buffering effects of social support on the organizational outcomes such as job stress, job performance, job satisfaction, and intention to stay at work, peer and superior support programs are paramount to enhance the well-being and satisfaction of the staff and the quality of care they provide for patients. As nursing shortage has become a global problem, comprehensive strategies including workplace support groups should be designed to enhance nurses' retention.

Raeda Fawzi AbuAlRub

SPIRITUALITY

Spirituality in the broadest sense is concerned with the facet of human being that is an unseen yet vital life force, the *pneuma* (Greek), *ruach* (Hebrew), or *Geist* (German) aspect of humanness (Smith, 1988). Spirituality and science seem to be contradictory notions as spirituality is inherently subjective and science seeks objective evidence. However, a health crisis often precipitates a spiritual crisis, so nurses, especially those working with critically ill or terminally ill people, are in a position to attend to spiritual as well as physical and emotional needs. By viewing health as wholeness or integration of body, mind, and spirit, and healing as restoring the integrity of that wholeness, spirituality then is an apt concept for nursing science. Neuroscientists have also established physiological connections between spiritual practices, such as prayer and meditation, and the brain and neurochemical processes (Hagerty 2009, Newberg & Newberg, 2005). The growth of Faith Community Nursing as a practice specialty has also brought attention to spirituality as an important concept for nursing knowledge development.

Spirituality has been a component of the frameworks of several nursing philosophies and theories as well as the focal point of middle-range theories. For example, Joyce Travelbee (1971), while not using the term "spirituality," discusses suffering and finding meaning in the illness experience, concepts that are associated with spirituality. Finding meaning and connectedness, two attributes of spirituality, are central to Margaret

Newman's (2008) theory of health as expanding consciousness. Presence, a nursing intervention for spiritual distress, is also a key aspect of Newman's theory. Jean Watson (2008b) includes spirituality in caring theory and in the caritas processes associated with the caring theory. The middle range Theory of Self-Transcendence (Reed, 2008) reflects spirituality in both the assumptions of the theory (that humans are pan-dimensional, which includes "reaching out to others, nature, and God," p. 105) and in the description of the transpersonal aspect of the major theoretical concept of self-transcendence. Spirituality, central concept in the middle range theory of spiritual well-being in illness (O'Brien, 2008), focuses on finding spiritual meaning during illness experiences.

Nurse researchers interested in examining spirituality are faced with several challenges. Because spirituality is inherently subjective, one consideration is defining and measuring spirituality as a research variable. Although concept analyses on "spirituality" have identified attributes of spirituality (Buck, 2006; Emblen, 1992; Sessanna, Finnell, & Jezewski, 2007; Tanyi, 2002) and the inclusion of "spiritual distress," "spiritual well-being," "spiritual health," "spiritual growth facilitation," and "spiritual support" in the nursing diagnosis, intervention, and outcomes lexicon (Johnson et al., 2006), it cannot be assumed that spirituality means the same to everyone. For example, Burkhardt and Nagai-Jacobson (2005) discuss inner peace, trust in the ability to deal with life challenges, interconnectedness between a person and the sacred, nature, self, and others as characteristics of spirituality. O'Brien (2008) includes love, compassion, caring, transcendence, a relationship with God, and the connection of body, mind, and spirit as important features of spirituality. Stranahan (2008) identified important attributes of spirituality as the need to find meaning and purpose in life, inner strength for coping with the present and hoping for the future, transcendence in relationships with God or higher power as well as others, and religion as a way to organize spiritual beliefs and customs. A common element in many definitions of spirituality is "connection with what is perceived as sacred in life" (Thoresen, 2007, p. 5).

Differentiating spirituality and religiosity is another important consideration for those interested in researching spirituality. Religious practices may be components of spirituality as well as supportive nursing interventions for enhancing spiritual well being, but defining spirituality solely in religious terms excludes nonreligious people from research populations. Attending religious services or participating in religious activities may be more an indicator of physical and social capabilities rather than a measure of spirituality.

Measuring spirituality presents another set of challenges. Measurements used in spirituality and health research are primarily self-report scales that measure either a disposition of an individual to be spiritual or religious or the function of spirituality or religion in a person's life (Hill, 2005; Hill, Kopp, & Bollinger, 2007). Hill (2005) classifies disposition measures into four categories and functional measures into eight categories, related to health-relevant domains originally identified by the Fetzer Institute/National Institute on Aging Working Group (1999). Disposition measures include scales related to general spirituality or religiousness, religious or spiritual commitment, religious or spiritual development, and spiritual or religious history. Functional measures are categorized as focusing on religious or spiritual social participation, private practices, support, coping, beliefs and values, motivating forces, techniques for regulating or reconciling relationships (forgiveness), and religious or spiritual experiences. The Fetzer Institute working group also developed a multidimensional measure of religiousness/spirituality that includes both functional and dispositional domains.

Establishing causal relationships between spiritual practices and changes in health have been difficult to determine. Although clear neurochemical and brain pattern changes have been demonstrated with the use of meditation, prayer, and mystical experiences (Hagerty, 2009; Newberg & Newberg, 2005), the effect of interventions such as distant intercessory prayer have not been well supported in research (Masters, 2007). In the studies of distant intercessory prayer, people who were being prayed for were also receiving medical treatment, so the effects of prayer could not be determined.

Despite these challenges, when people are considered from a holistic perspective, it is essential to include concepts and interventions related to spirituality in studying health and illness.

Carol D. Gaskamp
Martha G. Meraviglia

STATISTICAL TECHNIQUES

There are many statistical techniques that are useful to nurses in the analysis of quantitative research findings. Research questions will provide the foundation for selecting the statistical method. This entry reviews basic statistical techniques. The *t* test involves an evaluation of means and distributions of two groups. The *t* test, or Student's *t* test, is named after its inventor, William Gosset, who published under the pseudonym Student. Gosset invented the *t* test as a more precise method of comparing groups. The *t* test reflects the probability of getting a difference of a given magnitude in groups of a particular size with a certain variability if random samples drawn from the same population were compared. Three factors are included in the analysis: difference between the group means, size of each group, and variability of scores within the groups. The *t* tests are very useful when two groups or two correlated measures are being compared. Although analysis of variance (ANOVA) can accomplish the same results, the *t* test continues to be used when appropriate as it is easy to present and to understand.

ANOVA is a parametric statistical test that measures differences between two or more mutually exclusive groups by calculating the ratio of between- to within-group variance, called the *F* ratio. It is an extension of the *t* test, which compares two groups. The independent variable(s) is categorical (measured at the nominal level). The dependent variable must meet the assumptions of normal distribution and equal variance across the groups. A one-way ANOVA means that there is only one independent variable (often called factor), a two-way ANOVA indicates two independent variables, and an *n*-way ANOVA indicates that the number of independent variables is defined by *n*.

Analysis of covariance (ANCOVA) is a statistical technique that combines ANOVA with regression to measure the differences among group means. ANCOVA has been used in both experimental and nonexperimental studies to "equate" the groups statistically. When the groups differ on some variable, ANCOVA is used to reduce the impact of that difference. Although ANCOVA has been widely used for such statistical "equalization" of groups, there is controversy about such efforts, and careful consideration should be given to the appropriateness of the manipulation. ANOVA and ANCOVA require that post hoc tests are used for pairwise comparison of group means.

An ANOVA may include more than one dependent variable. Such an analysis usually is referred to as multivariate ANOVA and allows the researcher to look for relationships among dependent as well as independent variables. When conducting a multivariate ANOVA, the assumptions underlying the univariate model still apply; in addition, the dependent variable should have a "multivariate normal distribution with the same variance covariance matrix in each group" (Norusis, 1994, p. 58). The requirement that each group will have the same variance covariance matrix means that the homogeneity of variance assumption is met for each dependent variable and that the correlation between any two dependent variables must be the same in all groups. Box's *M* is a measure of the multivariate test for homogeneity of variance.

Repeated measures ANOVA is an extension of ANOVA that reduces the error term by partitioning out individual differences that can be estimated from the repeated measurement of the same subjects. There are two main types of repeated measures designs (also called within-subjects designs). One involves taking repeated measures of the same variable(s) over time on a group or groups of subjects. The other involves exposing the same subjects to all levels of the treatment. This is often referred to as using subjects as their own controls.

Correlation is a procedure for quantifying the linear relationship between two or more variables. It measures the strength and indicates the direction of the relationship. The Pearson product–moment correlation coefficient (*r*) is the usual method by which the relation between two variables is quantified. There must be at least two variables measured on each subject; and although interval- or ratio-level data are most commonly used, it is also possible in many cases to obtain valid results with ordinal data. Categorical variables may be coded for use in calculating correlations and regression equations. Although correlations can be calculated with data at all levels of measurement, certain assumptions must be made to generalize beyond the sample statistic. The sample must be representative of the population to which the inference will be made. The variables that are being correlated must each have a normal distribution. The relationship between the two variables must be linear. For every value of one variable, the distribution of the other variable must have approximately equal variability. This is called the assumption of homoscedasticity. The correlation coefficient is a mathematical representation of the relationship that exists between two variables. The correlation coefficient may range from +1.00 through 0.00 to –1.00. A +1.00 indicates a perfect positive relationship, 0.00 indicates no relationship, and –1.00 indicates a perfect negative relationship. In a positive relationship, as one variable increases, the other increases. In a negative relationship, as one variable increases, the other decreases. The strength of correlation coefficients has been described as follows: .00–.25—little if any; .26–.49—low; .50–.69—moderate; .70–.89—high; and .90–1.00—very high (Munro, 1997, p. 235). The coefficient of determination, r^2, often is used as a measure of the "meaningfulness" of *r*. This is a measure of the amount of variance the two variables share. It is obtained by squaring the correlation coefficient.

Logistic regression is used to determine which variables affect the probability of the occurrence of an event. In logistic regression, the independent variables may be at any level of measurement from nominal to ratio. The dependent variable is categorical, usually a dichotomous variable. Although it is possible to code the dichotomous variable as 1/0 and run a multiple regression or use discriminant function analysis for categorical outcome measures (two or more categories), this is generally not recommended. Multiple regression and discriminant function are based on the method of least squares, whereas the maximum-likelihood method is used in logistic regression. Because the logistic model is nonlinear, the iterative approach provided by the maximum-likelihood method is more appropriate. Logistic regression has been reported in the medical literature for some time, particularly in epidemiological studies. Recently, it has become more common in nursing research. This is the result of a new appreciation of the technique and the availability of software to manage the complex analysis. This multivariate technique for assessing the probability of the occurrence of an event requires fewer assumptions than does regression or discriminant function analysis and provides estimates in terms of odds ratios that add to the understanding of the results.

Chi-square is the most frequently reported nonparametric technique. It is used to compare the actual number (or frequency) in each group with the "expected" number. The expected number can be based on theory, previous experience, or comparison groups. Chi-square tests whether or not the expected number differs significantly from the actual number. Chi-square is the appropriate technique when variables are measured at the nominal level. It may be used with two or more mutually exclusive groups. When the groups are not mutually exclusive, as when the same subjects are measured twice, an adaptation of chi-square, the McNemar test, may be appropriate. The McNemar test can be used to measure change when there are two dichotomous measures on the subjects. When comparing groups of subjects on ordinal data, two commonly used techniques are the Mann–Whitney *U*, which is used to compare two groups and is thus analogous to the *t* test, and the Kruskal–Wallis *H*, which is used to compare two or more groups and is thus analogous to the parametric technique ANOVA.

When one has repeated measures on two or more groups and the outcome measure is not appropriate for parametric techniques, two nonparametric techniques that may be appropriate are the Wilcoxon matched-pairs signed rank test and the Friedman matched samples. The Wilcoxon matched-pairs is analogous to the parametric paired *t* test, and the Friedman matched samples is analogous to a repeated-measures ANOVA.

In addition to nonparametric techniques for making group comparisons, there are nonparametric techniques for measuring relationships. There is some confusion about these techniques. For example, point-biserial and Spearman rho are often considered nonparametric techniques but are actually shortcut formulas for the Pearson product–moment correlation (*r*). Biserial and tetrachoric coefficients are estimates of *r*, given certain conditions. True nonparametric measures of relationship include Kendall's tau and the contingency coefficient. Kendall's tau was developed as an alternative procedure for Spearman rho. It may be used when measuring the relation between two ranked (ordinal) variables. The contingency coefficient can be used to measure the relationship between two nominal-level variables. The calculation of this coefficient is based on the chi-square statistic. Nonparametric techniques should be considered if assumptions about the normal distribution of variables cannot be met. These techniques, although less powerful, provide a more accurate appraisal of group differences and relationships among variables when the assumptions underlying the parametric techniques have been violated.

Regression is a statistical method that makes use of the correlation between two variables and the notion of a straight line to develop an equation that can be used to predict the score of one of the variables, given the score of the other. In the case of a multiple correlation, regression is used to establish a prediction equation in which the independent variables are each assigned a weight based on their relationship to the dependent variable, while controlling for the other independent variables.

Regression is useful as a flexible technique that allows prediction and explanation of the interrelationships among variables and the use of categorical as well as continuous variables. Regression literally means a falling back toward the mean. With perfect correlations, there is no falling back; using standardized scores, the predicted score is the same as the predictor. With less than perfect correlations there is some error in the measurement; the more error, the more regression toward the mean.

In multiple regression, the multiple correlation (*R*) and each of the *b*-weights are tested for significance. In most reports, the squared multiple correlation, R^2, is reported, as that is a measure of the amount of variance accounted for in the dependent variable. A significant R^2 indicates that a significant amount of the variance in the dependent variable has been accounted for. Testing the *b*-weight tells us whether the independent variable associated with it is contributing significantly to the variance accounted for in the dependent variable.

Although variables at all levels of measurement may be entered into the regression equation, nominal-level variables must be specially coded prior to entry. Three main types of coding are used: dummy, effect, and orthogonal. Regardless of the method of coding used, the overall R is the same, as is its significance. The differences lie in the meaning attached to testing the *b*-weights for significance. With dummy coding the *b*-weight represents the difference between the mean of the group represented by that b and the group assigned 0s throughout. In effect, coding the *b*'s represent the difference between the mean of the group associated with that *b*-weight and the grand mean. With orthogonal coding, the *b*-weight measures the difference between two means specified in a hypothesized contrast. Interactions among variables also may be coded and entered into the regression equation.

When using regression, it is of utmost importance to select variables for inclusion in the model on the basis of clear scientific rationale. The method for entering variables into the equation is important, as it affects the interpretation of the results. Variables may be entered all at once, one at a time, or in subsets. Decisions about method of entry may be statistical, as in stepwise entry (where the variable with the highest correlation with the dependent variable is entered first), or theoretical. Stepwise methods have been criticized for capitalizing on chance related to imperfect measurement of the variables being correlated. It is generally recommended that decisions about the order of entry of variables into the regression equation should be made on the basis of the research questions being addressed. Multiple regression is the most commonly reported statistical technique in health care research. It can be used for both explanation and prediction but is more commonly reported as a method for explaining the variability in an outcome measure.

Barbara Munro

STORY THEORY

Collaborative work on story theory began in 1996, and the theory was first published in 1999. In the 14 years since we first began thinking through the meaning of story sharing for health, we have accomplished a great deal and have moved a short distance from where we began. Story theory proposes that story is a narrative happening of connecting with self-in-relation through nurse–person intentional dialogue to create ease. All nursing encounters occur within the context of story. The stories of the nurse, patient, family, and other health care providers are woven together to create the tapestry of the moment…the unfolding story about a complicating health challenge.

Story theory directly connects to the focus through caring as intentional dialogue about an experience of a complicating health challenge. When introduced, story theory was named Attentively Embracing Story (Smith & Liehr, 1999), and the name was changed between 2003 and 2006 to story theory. Attentively embracing is still central to the underlying meaning of the theory indicating the importance of accepting self-in-relation to one's world to create a sense of comfort. Story theory provides a relevant structure for guiding advanced practice nursing where gathering stories is a central activity in the nurse–patient interchange.

Story theory is based on three assumptions that underpin the conceptual structure:

(a) people change as they interrelate with their world in a vast array of flowing connected dimensions; (b) live in an expanded present moment where past and future events are transformed in the here and now; and (c) experience meaning as a resonating awareness in the creative unfolding of human potential (Liehr & Smith, 2008b, p. 209). The three concepts of the theory are connecting with self-in-relation, intentional dialogue, and creating ease. Intentional dialogue is querying emergence of a health challenge story in true presence (Smith & Liehr, 1999). It is purposeful engagement with another to summon the story of a complicating health challenge (Liehr & Smith, 2008b). Connecting with self-in-relation occurs as reflective awareness on personal history (Smith & Liehr, 1999). It is an active process of recognizing self as related with others in a developing story uncovered through intentional dialogue (Liehr & Smith, 2008b). Creating ease is remembering disjointed story moments to experience flow in the midst of anchoring (Smith & Liehr, 1999). The remembering creates a space of fit where one can anchor even for only a moment. Paradoxically, anchoring is accompanied by flowing as energy surfaces with the coming together of story moments into a comprehensible whole and there is movement toward resolving the complicating health challenge (Liehr & Smith, 2008b).

When using story theory to guide research, the nurse researcher poses a question about a particular health challenge and the participant is queried to understand how the health challenge has been lived. Liehr and Smith (2008b) propose approaches for qualitative and quantitative analysis of story data. Quantitative analysis is accomplished with narrative analysis software, Linguistic Inquiry and Word Count using story transcriptions. A story inquiry method has been proposed for qualitative analysis of story data (Liehr & Smith, 2011). The method incorporates the following inquiry processes: (1) Gather stories about a complicating health challenge. A story path is a useful way to gather stories by centering the story teller on the present experience, past influence, and hopes and dreams regarding a complicating health challenge. (2) Begin deciphering dimensions of the complicating health challenge. Dimensions of the challenge are unique descriptions of the story teller's experience. (3) Describe the developing story plot. Story plot includes high points when things are going well, low points when things are not going so well, and turning points where there are important decisions or twists in the story (Liehr & Smith, 2008b). (4) Identify movement toward resolving. Movement to resolve the complicating health challenge encompasses actions taken by the participant to address their situation. (5) Synthesize findings to address the research question. When using the story inquiry process, the researcher will center the research question on dimensions of the complicating health challenge; high points, low points, and/or turning points; or actions taken to move toward resolving.

Story theory offers potential for guiding research and building knowledge tied to the disciplinary perspective of nursing. Providing a theory-based substantive guide for story-gathering and data analysis brings depth and coherence to scientific inquiry when the nurse–researcher is questioning the experience of participants who are facing a health challenge.

Mary Jane Smith
Patricia Liehr

STRESS

The term "stress" first appeared in the *Cumulative Index to Nursing and Allied Health Literature* in 1956. Nursing's interest in stress as a focus of research has mushroomed since

1970. Although the word "stress" is familiar to many and has become part of our everyday vocabulary, the term conveys divergent meanings, and multiple theories have been proposed to explain it. Most of the theories attempting to describe and explain stress as a human phenomenon can be categorized under one of three very different orientations to the concept: response based, stimulus based, and transaction based. The response-based orientation was developed by Selye (1976), who defined stress as a nonspecific response of the body to any demand. That is, regardless of the cause, situational context, or psychological interpretation of the demand, the stress response is characterized by the same chain of events or same pattern of physiological correlates. Defined as a response, stress indicators become the dependent variables in research studies. Nurse researchers who have used the response-based orientation measure catecholamines, cortisol, urinary Na/K ratio, vital signs, brain waves, electrodermal skin responses, and cardiovascular complaints as indicators of stress. The demand component of Selye's definition is treated as an independent variable, whereas hospitalization surgery or critical care unit transfer were commonly the assumed stressor in much of the nursing research using this orientation. The response-based model of stress is not consistent with nursing's philosophical presuppositions that each individual is unique and that individuals respond holistically and often differently to similar situations (Lyon & Werner, 1987).

The stimulus-based theoretical explanation treats stress as a stimulus that causes disrupted responses. As a stimulus, stress is viewed as an external force similar to the engineering use of the term to represent dynamics of strain in metals or an external force directed at a physical object. Defined in this way, stress becomes the independent variable in research studies. The most frequently cited example of a stimulus-based theory is the life event theory proposed by Holmes and Rahe (1967). Stress is operationalized as a stable additive phenomenon that is measurable by researcher-selected life events or life changes that typically have preassigned normative weights. The primary theoretical proposition of the stimulus-based orientation is that too many life events or changes increase vulnerability to illness. Results of studies (Lyon & Werner, 1983) using the life event perspective have failed to explain illness, accounting for only 2% to 4% of the incidence of illness. Noting the limitations of the stimulus-based orientation yet recognizing the need to attend the "initiator" of a stress experience, Werner (1993) proposed a useful classification of stressors that includes dimensions of locus, duration, temporality, forecasting, tone, and impact.

The third way to conceptualize stress is a transaction between person and environment. In this context stress refers to uncomfortable tension-related emotions that arise when demanding situations tax available resources, and some kind of harm, loss, or negative consequence is anticipated (Lazarus, 1966; Lazarus & Folkman, 1984). As a special note, the Lazarus (1966) reference represents a class work in demonstrating how theory informs research and then how research in turn shapes and reshapes theory. In the transactional orientation, stress represents a composite of experiences, including threatening appraisals, stress emotions (anxiety, fear, anger, guilt, depression), and coping responses. As such, the term "stress" has heuristic value but is a difficult construct to study. Use of a transactional theoretical orientation requires that the researcher clearly delineate which aspects of the person–environment transaction are to be studied (Lazarus; Lazarus & Folkman). Commonly, the independent variables in experimental and quasi-experimental studies based on the transactional orientation are personal resources such as self-esteem, perceived control, uncertainty, social support, and hardiness. Appraisal of threat versus appraisal of challenge is commonly studied as a mediating factor between resource strength and coping responses. Dependent variables often include somatic outcomes such as pain, emotional disturbances such as anxiety and depression, and well-being. The transactional model was deemed by Lyon and Werner (1987) to be compatible with nursing's philosophical suppositions.

Lyon and Werner (1987) published a critical review of 82 studies conducted by nurses from 1974 to 1984. The studies reviewed fell evenly across the three different theoretical orientations, and approximately 25% of the studies were atheoretical in nature. In 1993, Barnfather and Lyon edited a monograph of the proceedings of a synthesis conference on stress and coping held in conjunction with the Midwest Nursing Research Society. This critical review of the research covered 296 studies published from 1980 to 1990. Both the 1987 and the 1993 critical reviews noted a disturbing absence of programs of research, making it difficult to identify what we have learned from the discipline's research efforts. A compilation of critical reviews of the nursing research literature from 1991–1995 focused on stressors and health outcomes, stressors and chronic conditions, coping, resources, and appraisal and perception; the influence of nursing interventions on the stress-health outcome linkage consistently noted the increase in well-designed studies (Werner & Frost, 2000). Each of these critical reviews noted knowledge gained and gaps in knowledge to guide future research.

In the landmark *Handbook of Stress, Coping, and Health: Implications for Nursing Research, Theory and Practice* (Rice, 2000), the evolution of the efforts of nurse researchers to test various theoretical models of stress, coping, and health is critically reviewed. Importantly, the handbook includes critical reviews of developing programs of nursing research.

The phenomenon of stress is not a new interest within the context of nursing research, as previously stated. Literature from 2000 to 2010 indicated that the vast majority of the findings are focused on reported sources of stress, potentially harmful physiological effects of prolonged periods of stress, categorization of reported coping strategies, identification of possible interventions aimed at reducing the negative effects of stress, and transdisciplinary collaboration to advance the science related to stress.

A total of 41 studies were identified between 2000 and 2010. Key concepts that emerged from the literature include that of hardiness, resiliency, workload, and coping strategies. The researchers provided recommendations for future research.

It is clear from all of the aforementioned critical reviews that our knowledge of how stress affects health is evolving. The significance of nursing research in the area of stress grows even more important in the era of escalating costs for health care services. It is widely recognized that as many as 65% of visits to physician offices are for illnesses that have no discernible medical cause, and many of those illnesses are thought to be stress related. Furthermore, productivity in the workplace is thought to be greatly affected by the deleterious effects of stress.

Future opportunities for nursing research include (a) psychosomatic illness as it relates to prolonged presence of stress, debility over time, and long-term effects on quality of life; (b) personal resiliency; (c) vulnerability to illness based on style of coping stress; and (d) evaluation of various coping strategies for effectiveness to include meditation, quality family or leisure time, regular physical activity, and educational sessions designed to present information about the concept of stress, internalization of stress, alternate coping strategies, avoidance of stress, and adaptation to stress.

Kimberly B. Hall

STRESS MANAGEMENT

Stress management is a broad term that encompasses a wide range of methods intended to prevent stress or effectively manage it as evidenced by low levels of stress emotions and improved coping abilities. "Stress management interventions are deliberate actions taught to patients to help achieve outcomes" (Synder, 2000, p. 179). Coping strategies are actions self-initiated by a person to manage stress. Coping strategies are typically categorized as direct action/problem focused aimed at alleviating or decreasing the intensity of perceived threat or palliative/emotion focused aimed at decreasing or keeping in check the intensity of stress emotions experienced (Lazarus & Fokman, 1984).

Nurse researchers have studied stress management interventions and coping strategies in various groups of people, including nurses, student nurses, and patients. It is interesting to note that majority of these studies have been conducted by nurse researchers in European and Asian countries. Some of the coping strategies frequently used by nurses to manage stress include taking action, drawing on past experiences, using problem-solving techniques, using humor, talking over problems with coworkers, accepting the situation, taking breaks (escaping from the situation), using diversions, using relaxation, and exercise (Lewis & Robinson, 1986; Petermann, Springer, & Farnsworth, 1995). Coping strategies taken to prevent stress involve balancing demands and resources, focusing on the positive in difficult situations, maintaining perceived choice and sense of personal control, building social support, and viewing difficult situations as challenges that can bring gain or benefit through learning (Dionne-Proulz & Pepin, 1993; Lyon, 1996).

Nursing research studies on the effects of stress management interventions with various patient population groups have yielded equivocal results. Snyder (1993) critically reviewed all 54 stress-related intervention studies appearing in the nursing literature from 1980 through 1990. The types of stress management interventions used included relaxation strategies (e.g., progressive muscle relaxation, imagery, meditation, breathing techniques, massage, music), educational strategies, and use of social support groups. A major flaw of most of the intervention studies was an inadequate description of the intervention used, and there was a lack of attempts to explain the theoretical link between the intervention and outcome measures. Manipulation checks as a way to assure that subjects mastered the intervention also were lacking in the intervention studies. Studies using sensation information (e.g., Johnson, Rice, Fuller, & Endress, 1978) and studies using progressive relaxation techniques (e.g., Pender, 1985) have demonstrated positive effects on health-related outcomes such as less anxiety and an increased sense of well-being.

Since 1995, there has been little theoretical knowledge gained through nursing research about the effectiveness of stress management interventions or coping strategies. The two common findings, consistent with Lazarus (1966) and Lazarus and Folkman (1984), are that (a) direct action or problem-focused coping strategies and cognitive restructuring strategies are related to decreased stress-related outcomes such as anxiety, other negative mood states, and an increased sense of well-being; and (b) palliative or emotion-focused strategies are related to increased anxiety, other negative mood states, and distress. The most common theme is that stress is a subjective phenomenon that is experienced differently by each person. The most common outcomes measured as dependent variables have been stress emotions such as anxiety, other negatively toned mood states, and depression.

A comprehensive review of literature dated 2005–2010 revealed that both qualitative and quantitative studies have been conducted regarding strategies and approaches designed to manage stress. Study results indicated that acknowledgement of stress, and related causes, serve as the initial step in the process of managing stress. Approaches to stress management ranged from holistic and alternative methods to avoidance or elimination of stressors. Not all interventions were clearly defined, consistent in design, and few of the studies would be able to be replicated. The following themes emerge from the studies reviewed: (a) subjects must identify the stressor(s) and examine which variables are controllable or manageable; (b) individualized strategies are designed to counteract the effects of the stressor(s); (c) one or more coping strategies are implemented, which may include meditation, physical activity, creative outlets which offer diversion during periods of high stress, massage, removing oneself from a stressful situation; and (d) assess whether or a not a stressor can be accepted and therefore no longer be viewed as a stressor.

A new theoretical model relative to the management of stress evolved from the work of Zander and Hutton (2009). The theoretical model of effective coping illustrates the interrelatedness of the concepts of meaning, interventions and strategies, and commitment. The idea expressed is that the combination of meaning in one's effort, a commitment to one's efforts, and purposeful stress management strategies will result in effective coping abilities. The authors continue to actively test this theory.

Future directions for nursing research should focus on identifying patterns of appraisal, emotions, and coping that result in health-related outcomes. Additionally, for the discipline's research efforts to meaningfully contribute to knowledge generation, it is imperative that nurse researchers clearly define and delineate stress management interventions and offer testable theoretical formulations that explain how the interventions affect outcome variables within specified person and environment contexts. It is also essential that the researcher incorporate manipulation checks into the methodology to verify that the intervention "took." For example, when using a progressive muscle relaxation or autogenic relaxation strategy, it is important to verify that the participant experienced a sense of "relaxation." Likewise it is equally important for the researcher to verify that participants implement coping strategies correctly following a psychoeducational intervention. Results must be able to demonstrate that the intervention actually altered the target variable as proposed in the theoretical formulation. Furthermore, research designed to contribute to knowledge generation offers little meaning if the researcher does not reflect on the meaning of the findings in relation to proposed theoretical formulations.

Current developments in testing "ABC" codes (Alternative Link, 2004) representing nonpharmacological interventions and complementary and alternative therapies offer nursing the opportunity to demonstrate effectiveness of stress management interventions in assisting patients to achieve desired health-related outcomes (Lyon, 2000). The latter half of this decade will offer unprecedented opportunities for nurse scientists to demonstrate the cost-effectiveness of stress management interventions in nursing practice.

Kimberly B. Hall

STROKE

Stroke, also known as cerebrovascular accident or apoplexy, is a sudden loss of consciousness due to either a loss of blood flow to the brain or a sudden rupture of a blood vessel in or near the brain. There are two main types of strokes. An ischemic stroke is caused by thrombus formation due to narrowing of the arteries from arteriosclerosis, an embolus that has dislodged and traveled to the brain, or a lack of blood flow to the brain due to circulatory failure (American Heart Association [AHA], 2004). A hemorrhagic stroke results from the rupture of a blood vessel either in the space between the brain and the skull (subarachnoid hemorrhage) or deep within the brain tissue (intracerebral hemorrhage; AHA, 2004). A transient ischemic attack is a brief neurological dysfunction resulting from focal cerebral ischemia; however, it is not associated with any permanent cerebral infarction (Easton et al., 2009). Transient ischemic attacks are considered warning signs of stroke. Specific warning signs of stroke include (a) sudden numbness or weakness of the face, arm, or leg; (b) sudden confusion, trouble speaking, or understanding; (c) sudden trouble seeing in one or both eyes; (d) sudden trouble walking, dizziness, loss of balance, or coordination; or (e) a sudden severe headache (Lloyd-Jones et al., 2010). Common disabilities from stroke include hemiparesis (50%), inability to walk without assistance (30%), activities of daily living dependency (26%), aphasia (19%), depressive symptoms (35%), and institutionalization in a nursing home (26%) (Lloyd-Jones et al., 2010).

Stroke is the third leading cause of death in the United States, behind heart disease and cancer, and about a quarter of first-time stroke survivors die within 1 year of having a stroke (Lloyd-Jones et al., 2010). Approximately 610,000 people each year experience a stroke for the first time, and another 185,000 suffer a recurrent stroke (Lloyd-Jones et al., 2010). Stroke is also a leading cause of serious, long-term disability in the United States (Lloyd-Jones et al., 2010). Between 50% and 70% of stroke survivors will recover their independence; however, 15% to 30% become permanently disabled (Lloyd-Jones et al., 2010). In 2010, stroke was estimated to cost $73.7 billion, with a mean lifetime cost for ischemic stroke estimated at $140,048 per person including inpatient care, rehabilitation, and follow-up care (Lloyd-Jones et al., 2010).

There are a number of treatments for stroke. Carotid endarterectomy is the most common surgical procedure, and anticoagulants and antiplatelet agents are the most common medications used to prevent stroke (AHA, 2004). Tissue-type plasminogen activator (tPA) is a drug that must be given intravenously to patients with ischemic stroke within 3 hours of the first warning sign to prevent disability from stroke. Unfortunately, few stroke survivors are able to make it to a physician who can administer tissue-type plasminogen activator within the 3-hour time window. This dilemma has prompted the development of primary stroke centers, which the Joint Commission on the Accreditation of Healthcare Organizations began certifying in 2003 (Lichtman et al., 2009). Certification by Joint Commission on the Accreditation of Healthcare Organizations is given to those centers that are compliant with national stroke standards, follow the Primary Stroke Center recommendations and recent clinical practice guidelines, and are active with performance measurement and improvement activities (Lichtman et al., 2009). Recommendations for primary stroke centers include an integrated emergency response system, acute stroke team, inpatient stroke unit, and written care protocols. The acute stroke team must include a physician and a nurse who are available 24 hours a day for rapid evaluation of patients experiencing the warning signs of stroke (Alberts et al., 2000). Get With the Guidelines-Stroke (GWTG-Stroke), an improvement program that aligns patient care with the latest up-to-date stroke guidelines, has been extremely beneficial in the care and treatment of acute stroke. GWTG-Stroke has generated a lot of interest in research and in hospitals nationwide. In a study of 790 U.S. academic and community hospitals using GWTG-Stroke, Schwamm et al. (2009) reported substantial and sustained improvement in adherence to all acute stroke care and secondary prevention performance measures.

Once stroke survivors are stabilized, they enter the rehabilitation phase of treatment where they learn how to live with their disabilities from stroke. Multidisciplinary rehabilitation teams consist of physicians, physiatrists, nurses, psychologists or psychiatrists, counselors, and physical, occupational, recreational, and speech therapists (AHA, 2004). To reduce fragmentation of stroke care across settings and to ensure that scientific knowledge is translated into practice, recommendations have been developed to establish stroke systems of care (Schwamm et al., 2005). These recommendations address how state and local communities can engage in efforts to promote primary stroke prevention, community education, emergency medical services, acute and subacute stroke treatment, rehabilitation, and quality improvement activities (Schwamm et al., 2005).

Learning how to live with disabilities resulting from stroke is challenging not only for stroke survivors but also for their family caregivers. After stroke, depression is a major complication of stroke and can greatly impede recovery (AHA, 2004). Other quality of life issues for stroke survivors include disruption of personality and moods, diminished self-care, changes in social and family roles, and loss of work or productivity, among others (Williams, Weinberger, Harris, Clark, & Biller, 1999). Family caregivers often experience negative changes in social functioning, subjective well-being, and perceived health as a result of providing care (Bakas, Champion, Perkins, Farran, & Williams, 2006). Caregiver needs and concerns typically focus on finding information about stroke, managing emotions and behaviors of the stroke survivor, providing physical and instrumental care, and dealing with one's own personal responses to caregiving (Bakas, Austin, Okonkwo, Lewis, & Chadwick, 2002).

Nurses are involved with the care of stroke survivors throughout the continuum of care. Judith Spilker et al. (1997) integrated the use of the NIH Stroke Scale into current nursing practice as a clinical stroke assessment tool. It is now widely used in stroke centers across the nation. Recently, two AHA Scientific Statements have been published that provide comprehensive overviews of nursing and interdisciplinary care of stroke patients across the care continuum (Miller et al., 2010; Summers et al., 2009). Summers et al. (2009) provide levels of evidence for nursing interventions directed toward the care of acute ischemic stroke patients. Miller et al. (2010) provide levels of evidence for rehabilitation care of stroke survivors and their family members across inpatient rehabilitation, outpatient, and chronic care settings. These AHA Scientific Statements provide a useful resource for practicing nurses, and they identify areas for future nursing research to demonstrate best practices in the care of stroke survivors and family caregivers across the care continuum.

A recent search of the RePORT Expenditures and Results (n.d.), a database of biomedical research funded by the National Institutes of Health, revealed two studies of interest funded by the National Institute for Nursing Research (NINR). Pamela Mitchell has been funded to evaluate a nurse-delivered psychosocial/behavioral intervention, which has been shown to be effective in reducing post-stroke depression (Mitchell et al., 2009). Sharon Ostwald has been funded to evaluate her intervention for stroke survivors and spousal caregivers. It is hopeful that these intervention programs will provide promise for the future care of stroke survivors. Another leader in stroke nursing research is Patricia Hurn, who has been funded by NINR since 1993 to study the role of estrogen in immunoprotection following stroke.

A search of the RePORT Expenditures and Results (n.d.) database also revealed many studies funded by NINR focused on family caregivers of stroke survivors. For example, Patricia Clark has been funded to explore family function, stroke recovery, and caregiver outcomes. Barbara Lutz has been funded to develop a dyad risk assessment profile to determine patient needs and caregiver concerns prior to discharge. Joan Grant documented the effectiveness of her problem-solving intervention in reducing stroke caregiver depression and improving caregiver perceived health (Grant, Elliott, Weaver, Bartolucci, & Giger, 2002). Rosemarie King has also been funded to evaluate the effectiveness of her problem-solving intervention for stroke caregivers. Tamilyn Bakas was funded to develop and pilot test the Telephone Assessment and Skill-Building Kit, which has shown evidence of content validity and satisfaction in stroke caregivers (Bakas et al., 2009). The Telephone Assessment and Skill-Building Kit program is currently being tested in a larger randomized controlled clinical trial. Linda Pierce has been funded to test her intervention titled, "The Caring Web" for stroke caregivers, which has been found to reduce emergency department visits and hospital readmissions of stroke survivors (Pierce, Steiner, Khuder, Govoni, & Horn, 2009). All of these studies show great potential toward improving the care and well-being of families of stroke survivors.

Now is a very fruitful time for nurses to conduct research in the area of stroke and stroke caregivers. With stroke being a leading cause of serious, long-term disability in the United States, it is imperative that nurses take the lead in developing programs that improve the care of stroke survivors and their family members.

Tamilyn Bakas
Staci S. Wuchner

STRUCTURAL EQUATION MODELING

Structural equation modeling (SEM) is used to describe theoretical and analytic techniques for examining cause-and-effect relationships. It is used interchangeably with the terms causal modeling, covariance structure modeling, and LISREL modeling. The theoretical issues are discussed in the entry on *Causal Modeling*. A description of the analytic issues when programs such as LISREL or EQS are used will ensue.

SEM techniques are extremely flexible. Most models of cause can be estimated. In some models, the causal flow is specified only between the latent variable and its empirical indicators, such as in a factor analysis model. This is known as confirmatory factor analysis. In other models, causal paths among the latent variables also are included.

Conducting a confirmatory factor analysis with SEM has many advantages. With SEM, the analyst can specify exactly which indicators will load on which latent variables (the factors), and the amount of variance in the indicators not explained by the latent variable (due to error in either measurement or model specification) is estimated. Correlations between latent variables and among errors associated with the indicators can be estimated and examined. Statistics that describe the fit of the model with the data allow the analyst to evaluate the adequacy of the factor structure, make theoretically appropriate modifications to the structure based on empirical evidence, and test the change in fit caused by these modifications. Thus, confirmatory factor analysis provides a direct test of the hypothesized structure of an instrument's scales.

An advantage of using SEM to estimate models containing causal paths among the latent variables is that many of the regression assumptions can be relaxed or estimated. For example, with multiple regression, the analyst must assume perfect measurement (no measurement error); however, with SEM, measurement error can be specified and the amount estimated. In addition, constraints can be introduced based on theoretical expectations. For example, equality constraints, setting two or more paths to have equal values, are useful when the model contains crosslagged paths from three or more time points. The path from latent variable A at Time 1 to latent variable B at Time 2 can be set to equal the path from latent variable A at Time 2 to latent variable B at Time 3. Equality constrains also are used to compare models for two or more different groups. For example, to compare the models of effects of maternal employment on preterm and full-term child outcomes, paths in the preterm model can be constrained to be equal to the corresponding paths in the full-term model.

Data requirements for SEM are similar to those for factor analysis and multiple regression in level of measurement but not sample size. Exogenous variables can have indicators that are measured as interval, near interval, or categorical (dummy-, effect-, or orthogonally coded) levels, but endogenous variables must have indicators that are measured at the interval or near-interval level. The rule of thumb regarding the number of cases needed for SEM, 5 to 10 cases per parameter to be estimated, suggests considerably larger samples than usually needed for multiple regression; thus, samples of 100 for a very modest model to 500 or more for more complex models are often required. Despite the advantages of SEM, these larger samples can result in complex and costly studies.

SEM is generally a multistage procedure. First, the SEM implied by the theoretical model is tested and the fit of the model to the observed data is evaluated. A nonsignificant χ^2 indicates acceptable fit, but this is difficult to obtain because the χ^2 value is heavily influenced (increased) by larger sample sizes. Thus, most analytic programs provide other measures of fit. A well-fitting model is necessary before the parameter estimates can be evaluated and interpreted.

In most cases, the original theoretical model does not fit the data well, and modifications must be made to the model in order to obtain a well-fitting model. Although deletion of nonsignificant paths (based on *t* values) is possible, modifications generally focus on the inclusion of omitted paths (causal or correlational). Any path that is omitted specifies that there is no relationship, implying a parameter of zero; thus, analysis programs constrain these paths to be zero. After estimating the specified model, most programs provide a numerical estimate of the "strain" experienced by fixing parameters to zero or improvement in fit that would result from freeing the parameters (allowing them to vary). Suggested paths must be theoretically defensible before adding them to the respecified model.

Because model respecification is based on the data at hand in light of theoretical evidence and those data are repeatedly tested, the significance level of the χ^2 is actually higher than what the program indicates. Thus, other criteria are necessary to evaluate the adequacy of the final model. First is the theoretical appropriateness of the final model. Comparison of the original model with the final model will indicate how much "trimming" has taken place. In addition, the values and signs of the parameters are evaluated. The signs (positive or negative) of the parameters should be in the expected direction. Parameters on the paths between the latent variable and its indicators should be $>.50$ but <1.0 in a standardized solution. The lower the unexplained variance of the endogenous variables, the better the model performed in explaining those endogenous variables (similar to the $1–R^2$ value in multiple regression). Results that are consistent with a priori expectations and findings from previous research increase one's confidence in the model.

In summary, SEM is a powerful and flexible analysis technique for testing models of cause, for investigating specific cause-and-effect relationships, and for exploring the hypothesized process by which specific outcomes are produced. With SEM programs, the researcher has greater control over the analyses than with other factor analysis and multiple regression programs. Model respecification is usually necessary, but the role of theory in selecting appropriate modifications is crucial.

JoAnne M. Youngblut

SUBSTANCE USE DISORDERS IN REGISTERED NURSES

Addiction, a health problem for registered nurses and other health professionals, came to the attention of nurse researchers in the 1980s. Social stigma, denial in the profession, and a dearth of willing research subjects are all reasons for a paucity of research in this area. In framing a research review and the scope of this professional issue, the term "substance dependence" is recommended over "addiction." Substance dependence is a maladaptive pattern of substance use with a cluster of cognitive, behavioral, and physiologic symptoms, outcomes of neurologic adaptation. An individual continues use despite significant impairment in social, professional, and/or legal function. "Substance abuse" has as its essential feature, this maladaptive pattern of use along with "recurring and adverse consequences" without physiologic dependence (American Psychiatric Association, 2000). These disorders result in significant disability and death for nurses and can contribute to below-standard nursing practice (impaired practice), endangering public health and safety.

Substance dependence in registered nurses challenges the profession to regulate its practitioners' delivery of high quality care. In 1982, a climate of social concern and the visibility of substance-related problems in nurses led to the American Nurses Association (ANA) and several specialty nursing associations, support of research and development of organizational positions about impaired practice, defined as "nursing practice which does not meet the professional ethical code and standards of nursing practice because cognitive, interpersonal, and/or motor skills of the practitioner are impaired by psychiatric illness or excessive use of alcohol and/or other drugs." The 1982 ANA House of Delegates passed a resolution on impaired practice, and a policy statement, *Addictions and Psychological Dysfunctions: The Profession's Response to the Problem*, followed (ANA, 1984). The economic consequences of substance-related disability, risk management, and continuing quality assurance still make substance dependence in health professionals an important policy issue.

The prevalence of substance dependence in nurses and health professionals as compared with the public was among the first research questions addressed. Approximately 9% of Americans abuse or are dependent on alcohol and 2% abuse or are dependent on other drugs (Grant et al., 2004). The recognition of nicotine addiction and efforts to limit its prevalence have resulted in female nurses' decreased rates of smoking (8.4% in 2003 from 33.2% 1976) (Sarna et al., 2004), significantly lower than the public's 20.6 % prevalence (Centers for Disease Control and Prevention, 2010a). Because the majority of nurses are women and the prevalence for alcohol dependence is 3 to 1, M/F, and because illicit drug use is lower in women, the prevalence of dependence on alcohol, nicotine, and illicit drugs was estimated to be lower in nurses than in American women in general (Clark & Farnsworth, 2006; Trinkoff & Storr, 1998a, 1998b; West, 2003). The findings of Trinkoff, Eaton, and Anthony (1991) provided sound epidemiologic data about prevalence based on a small sample of nurses in the Epidemiologic Catchment Area Study (National Institute of Mental Health). This was a multisite, probability sample of 142 nurses and suggested that nurses and control group members had similar rates of illicit drug use—marijuana, cocaine, heroin, psychedelics, tranquilizers, amphetamines, and other opiates—which were nurses (32.9%) and controls (31.5%).

Anecdotal and survey findings in the 1980s sought the etiology of addiction in nurses in small, convenience samples. Although critical to motivating further research, they generally provided little reliable data. In Bissell and Haberman's (1984) research about recovering nurses in an Alcoholics Anonymous sample, Bissell and Jones (1981), Sullivan, Bissell, and Leffler (1990), and Sullivan and Hale (1987) described the characteristics of recovering nurses, seeking to identify the nature and outcomes of their dependence. Newer theoretical and scientific findings on the heritability, genetic and environmental etiologies, pathophysiologies, and responses to addiction treatment support their observations of addiction as a complex, chronic, and treatable medical illness (McLellan, Lewis, O'Brien, & Kleber, 2000). There is now strong scientific evidence that the same factors that predispose the general population to addiction also predispose nurses. These include family history of substance abuse, stress and trauma, or sexual and/or emotional abuse, some of which were noted in the above reports. Research by Burns (1998) and Hutchinson (1986) mapped the trajectories of recovery for nurses with an eye toward understanding the origins of their disorders.

Professional risk factors for substance use in nurses first emerged in the work of Haack's (1988) on stress in nursing students. Although recognizing that stress does not precipitate substance dependence on drugs, a research trend has continued on workplace and occupational factors that can pose challenges in coping for practitioners with established alcohol, tobacco, and other drug use patterns. Blazer and Mansfield's (1995) randomized descriptive survey (*N* = 1,525) and the Nurses' Work life and Health Study (4,438 registered nurses) both explored how workplace factors, including stress, might contribute to substance use and abuse. Blazer and Mansfield compared 920 nurses with other female employees and found low use levels for illicit drugs and alcohol in all subjects. Nurses had the lowest prevalence of smoking and 79% of them reported moderate alcohol use. The Nurses' Worklife and Health Study, an anonymous, national survey of a stratified sample (78% response), reported smoking rates of 14% and cocaine/marijuana use at 4%, lower than in the general population; binge drinking rates were comparable (Trinkoff & Storr, 1998a, 1998b).

This study was the most comprehensive in validating higher prescription drug use rates for nurses. The prevalence of past-year substance use for all substances was 41%; for marijuana/cocaine, 4%; prescription drugs, 7%; cigarette smoking, 14%; and binge drinking, 16%. Male nurses were more likely to misuse prescription drugs, with opiates abused most frequently (60.3%) followed by tranquilizers (44.6%). The findings support the link between ease of workplace access and higher rates of prescription drug abuse and provided direction for further analyses of substance use by nursing specialty.

The investigations of Trinkoff, Geiger-Brown, Brady, Lipscomb, and Muntaner (2006) and Trinkoff and Geiger-Brown (2010) of workplace factors contributing to substance dependence continued on observed differences in substance use across specialties providing statistical insights. Later analyses suggest that nurses in certain specialties were more likely to use substances. It was reported that critical care and emergency nurses had higher rates of marijuana or cocaine use, oncology nurses had higher rates of binge drinking, and psychiatric, gerontology, and emergency nurses had the highest rates of smoking. Little evidence exists to support an increased prevalence of substance dependence among nurse anesthetists, although 10% of Certified Registered Nurse Anesthetists in a small survey admitted to diverting controlled substances (Bell, 2006, as cited in Wilson & Compton, 2009).

The Nurses' Worklife and Health Study findings link scheduling patterns with the prevalence and odds of substance use. Working overtime, working shifts longer than 8 hours, and working one or two weekends per month all increased the likelihood of alcohol use. In addition, smoking was more prevalent among night-shift workers and those working several weekends per month, a factor also associated with increased drug use.

West's (2002) research suggests that nurses with high numbers of early risk indicators (psychological stress, low self-esteem, low religiosity, distance in family, higher sensation seeking scores and family substance use histories) are at higher risk for alcohol and drug dependence which results in impairment. Attitudes about the benefits of medications and their ability to control use have also been identified as risk factors. Nurses who routinely administer medications believe them to be "safe." Familiarity, then, precedes self-medication, which precedes abuse (Trinkoff & Storr, 1994).

Brown, Trinkoff, and Smith (2003), Burns (1998), and Hutchinson (1986) described nurses' experiences of dependence and recovery as different from those of the general population but similar to other health professionals. A noteworthy fact is the use of prescription medications as opposed to street drugs, more frequently accessed in employment settings (Clark & Farnsworth, 2006). Additionally, it has been shown that traditional predictors of alcohol abuse, such as age, gender, and income, present little benefit in discovering alcoholism in health care professionals (Kenna & Wood, 2004), who are generally well educated and steady income earners. The role of intellectualization and denial in supporting use and abuse cannot be over emphasized. Despite the aforementioned prevalence of abuse and dependence in the profession, all of the nurses in one study described their health as "excellent to good," and often felt they "knew too much to become addicted" (Burns, 1998). These rationalizations extend as far as to reason that addiction is not possible so long as a chemical is being injected intramuscularly, not intravenously (Hastings & Burn, 2007).

The limited and dated research on addictions/substance dependence in nurses suggests that nurses share risk factors with the general population but that workplace-related factors, such as access to controlled substances and pharmaceutical knowledge, increase the risks for misuse and dependence for some. Of concern are the 60,010 disciplinary cases (27.53%) reported by the National Council of State Boards of Nursing (1996–2006; http://www.ncsbn.org/index.htm) for alcohol and other drug incidents, and the 16,268 cases categorized as drug diversion by the nurse for his or her own use. Clearly, substance abuse and dependence remain health problems for nurses and self-regulatory challenges for the profession. Most cases of alcoholism and many cases of drug diversion are not reported, suggesting a greater problem than the data support. There is a need for further research to explore the risk factors that might be influenced by professional education, workplace factors, and the development of substance dependence in nurses, the management of such problems in employment settings, and the access of nurses to "best practices" addiction treatment. Findings suggest that nurses generally receive less treatment and return to longer working hours than substance-dependent physicians, placing them at high risk for relapse. Nurses have less economic independence than physicians, which may explain shorter courses of treatment. They are also more likely to face sanctions which more severe on return to work (Shaw, McGovern, Angres, & Rawal, 2003). The differences in how addiction is perceived and treated in physicians and nurses, and limitations to access to high-quality treatment as a function of economic status remains areas for exploration for nurses and the public. Further study of successful recovery by nurses could help design more effective return-to-work programs and underscore the economic argument for policies that support rehabilitation and retention, which have demonstrable financial benefits. Although significant numbers of nurses are enrolled in monitoring and peer assistance associated with alternative to discipline programs, there is little research to support outcomes. This is in contrast to findings supporting some of the highest long-term addiction recovery rates recorded for physicians; one study reported that 78% of 904 recovering physicians tested regularly (mean = 83 tests) over a period of four 1/2 years had negative results on every single test (DuPont, McLellan, White, Merlo, & Gold, 2007). Such evidence on recovery in nurses could promote healthy lifestyles among nurses and encourage the pursuit of better treatment outcomes for health professionals, typically seen as health role models by the public (Smith & Leggat, 2007). The retention of educated and experienced nurses contributes to alleviating the nursing shortage, improves patient care, and strengthens professional resources (Trinkoff, 2006).

The growing evidence on risk factors suggests that early intervention with vulnerable nursing students and nurses could deter the prevalence of substance dependence. Education about these and policies that promote healthy work environments should also be evaluated. Unfortunately, little research exists on relationship of increased addictions education in medical or nursing programs on improved personal outcomes. Despite a 47% increase in the hours dedicated to drug abuse education in anesthesiology programs, for example, addiction rates remained largely unchanged (Booth, Grossman, Moore, Lineberger, Reynolds, Reves & Sheffield, 2002). Educational interventions in nursing curricula have yet to be evaluated beyond the outcomes of small addictions specialty programs (Naegle, 2002).

Madeline A. Naegle

SYSTEMATIC REVIEW

The volume of information and data available for consideration when making a clinical decision is increasing at unprecedented rates. It has become impossible for nurses to keep up with the literature in their field on a regular basis. Systematic reviews summarize evidence across relevant studies, published and unpublished. This scholarly integration of research findings and other evidence forms the foundation for evidence-based practice allowing the practitioner to make up-to-date decisions.

A systematic review involves the identification, selection, appraisal, and synthesis of the best available evidence for clinical decision making. A properly conducted systematic review uses reproducible, preplanned strategies to reduce bias and instill rigor and pools information from both published and unpublished sources. The inclusion of unpublished studies and reports is necessary to avoid, to the extent possible, a publication bias. The holistic understanding provided by a systematic review negates the reductionist view provided by a single study and allows the researcher to make sense of growing bodies of information (Cook, Mulrow, & Haynes, 1997).

Systematic reviews are conducted to answer specific, often narrow, clinical questions. These questions are formulated according to the mnemonic PICO addressing: a specific population (P) (such as people traveling long distance), the intervention of interest (I) (e.g., preventive measures for deep vein thrombosis), an optional comparison (C) (such as the standard of care, which may be no intervention), and one or more specific outcomes (such as prevention of deep vein thrombosis). An example, then, of a question for systematic review would be, In long-distance travelers, what is the most effective method of preventing deep vein thrombosis?

A quantitative systematic review uses statistical methods to combine the results of two or more studies, where appropriate. The review may or may not be a meta-analysis. A meta-analysis involves the pooling of results from comparable randomized controlled trials. The focus of a meta-analysis is on therapy and interventions. Its purpose is to provide a single estimate of effect of an intervention or treatment from the combined results of included studies. When the results of qualitative studies are synthesized, the review may be called a qualitative systematic review, or meta-synthesis. Economic systematic reviews compare both the costs and the consequences of different courses of action. By quantitatively combining the results of several studies, meta-analyses create more and convincing conclusions, meta-synthesis illuminates and expands the understanding of processes and meaning, and economic systematic review quantifies attributable cost and cost effectiveness. Examples of these are recent reviews highlighting nursing intershift reports in acute care hospitals (Poletick & Holly, 2010), outcomes of Magnet designation (Salmond, Begley, Brennan, & Saimbert, 2009), an examination of factors that contribute to nursing leadership, the effectiveness of educational interventions in developing leadership behaviors among nurses (Cummings et al., 2008), and an economic analysis of hospital-acquired infections (Stone, Braccia, & Larsen, 2005).

A systematic review involves several discrete steps. Decisions at each step of the process are accomplished through the use of at least two reviewers. The steps associated with planning, conducting, and interpreting findings follow.

The stages associated with planning the review are as follows:

1. Identification of the need for a review. This can be accomplished through "scoping," searching the literature to see if a review has been done already. If a review has been done, a determination is needed to approach the question differently, or a new question must be considered.
2. Formulation of a PICO-based research question.
3. Development of a review protocol that includes specific aims and objectives, clear inclusion and exclusion criteria, and an explicit search strategy developed with the assistance of a medical librarian. Consideration needs to be given to the importance of the problem addressed. The databases and other sources of evidence to be searched need is a prestudy decision.
4. Criteria for considering studies for review must include a description of the types of participants, types of interventions (if applicable), types of outcome measures, and types of studies (study designs).

The stages associated with conducting the review are as follows:

5. Identification of research studies and other evidence for possible inclusion in the review.
6. Assessment of methodological quality using a standardized critical appraisal instrument and conducted by at least two reviewers working independently.
7. Determination of studies for inclusion based on the quality assessment.
8. Data extraction involved.

The stages associated with interpreting the review are:

9. Data synthesis, which involves reasoning from the general to the particular whereby a new interpretation is presented. If heterogeneity is found, approaches to finding the reason need to be specified.
10. Recommendations for best practice.
11. Recommendations for further research.

While systematic reviews are regarded as the strongest form of evidence, a review of 300 studies found that not all systematic reviews were equally reliable and that their reporting could be improved by a universally agreed upon set of standards and guidelines (Moher, Tetzlaff, Tricco, Sampson, & Altman, 2007). Consequently, several international initiatives have evolved to help prepare, to maintain, and to disseminate the results of systematic reviews of health-related interventions. Notably are the Cochrane Collaboration (www.cochrane.org), which reviews randomized trials of the effects of treatment; the Campbell Collaboration (www.campbellcollaboration.org), which focuses on reviews that address issues of policy making, specifically related to crime, justice, social welfare, and education; and the Joanna Briggs Institute for Evidence Based Nursing and Midwifery (www.joannabriggs.edu.au), which focuses on reviews that support the translation, transfer, and utilization of feasible, appropriate, meaningful, and effective healthcare practice. In addition, the Evidence for Policy and Practice Information Center at the University of London (http://eppi.ioe.ac.uk/cms) has been influential in developing methods for combining both qualitative and quantitative research in systematic reviews for social science, public policy, and health promotion. These groups provide peer review of systematic review protocols against particular guidelines, which further increases scientific rigor.

In summary, a systematic review is a research method conducted by at least two people, working independently and then combining their independent results. The review is guided by a question, with specific aims and objectives, and conducted in accordance with a predefined strategy, with an overall intent to identify and recommend best practice. In particular, researchers performing a systematic review must make every effort to identify and report research that both supports and does not support their preferred research position. It is this unbiased approach that makes a review systematic.

Investigation into the science of systematic review is among the necessary future initiatives for this research method. In addition, it is not unusual now to find more than one systematic review addressing the same or similar questions paving the way for meta-summary or meta-study, a systematic review of systematic reviews, which further supports the growing need for investigation into the science of systematic review.

Cheryl Holly

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Telehealth

Telehealth is defined as the use of interactive technology for the provision of clinical health care, patient and professional education, public health, and health care administration over small and large distances (American Nurses Association, 1999; Chaffee, 1999). The defining aspect of Telehealth is the use of electronic signals to transfer various types of personal health information from one site to another. Information ranges from clinical records to health promotion instructions to still-images of wounds and motion-images demonstrating exercise routines. Throughout the published literature relevant to the health sciences, telehealth is used interchangeably with telemedicine, and every so often the term telenursing will surface. The term telehealth is embraced as the more encompassing concept, descriptive of the state of technology used in the provision of health care; telemedicine and telenursing are subsets of telehealth.

Telehealth has tremendous potential for nursing, both as a means of communication among nurses, patients, and their caregivers, and as a way to deliver tailored nursing services. Telehealth can serve in nearly every area of nursing care, from emergency response systems to hospital, home, and community care. Telehealth has the potential of expanding health care services beyond traditional geographic boundaries and enabling access to a broader range of care options in previously underserved areas, and at times in which health care providers commonly are not accessible. It can be used for bedside nursing care, patient education, or to assist nursing care at distant sites. This broad definition includes several means of transmission, including telephone and fax transmissions, interactive video and audio, store-and-forward technology, patient monitoring equipment, electronic patient records, electronic libraries and databases, the Internet and intranet, World Wide Web, electronic mail systems, social media, decision and care planning support systems, and electronic documentation systems. When used optimally, telehealth can be used to leverage limited health care resources to better meet the needs of patients (Bendixen, Levy, Olive, Kobb, & Mann, 2009; Lillibridge & Hanna, 2009; Malacarne et al., 2009; Rajasekaran, Radhakrishnan, & Subbaraj, 2009).

Most nurses have been already been involved in telehealth without realizing it. Examples include telephoning or faxing a patient status report, telephone triage, home health visits via telecommunication for monitoring, participation in social media, and designing Web sites for educating patients. Although much attention has been paid to technology and innovative equipment as a potential to enhance the access and availability of health care services for patients, regardless of where they live, very little work has been accomplished in the area of systematically reviewing the efficiency and effectiveness of its applications. Numerous studies have shown that telehealth can produce clinically similar care to face-to-face visits with health practitioners, that it can improve patients' access to care, and can reduce hospital and patient travel costs (Rheuban, 2006). However, studies on the clinical outcomes of care have focused on different patient populations, different disease categories, and different telehealth technologies, making it difficult to assess the overall effect of telehealth on clinical outcomes of care resulting in mixed findings and some unanswered questions (Bensink, Hailey, & Wootton, 2006; Dansky, Vasey, & Bowles, 2008; DelliFraine & Dansky, 2008).

Research examining telehealth in support of clinical nursing is still maturing. With some projects, say Brennan's ComputerLink work (Brennan, Moore, & Smyth, 1991), the acceptance of telehealth for clinical nursing was realized only in the last decade (Heisler, 2007, 2009; Mohr, Vella, Hart, Heckman, & Simon, 2008; Nahm et al., 2008; Sorensen, Rivett, & Fortuin, 2008; Zolfo, Lynen, Dierckx, & Colebunders, 2006). This relatively slow growth is a consequence both of the state of telehealth applications and the expectations of nurses regarding the nature of appropriate interventions. The World Wide Web is now several decades old and the penetration of information technology into daily life, although accelerating, has yet to touch the lives of more than 80% of the American public. Additionally, the nursing discipline initially concentrated its professional and scientific attention on face-to-face encounters with patients (Dansky, Yant, Jenkins, & Dellasega, 2003; Darkins, Fisk, Garner, & Wootton, 1996; Gardner et al., 2001; Johnson-Mekota et al., 2001; Wakefield, Flanagan, & Pringle Specht, 2001; Whitten, Cook, & Doolittle, 1998). Nursing is now moving toward embracing information technology to support and expand the delivery of care (Heisler, 2007; Lillibridge & Hanna, 2009; Rajasekaran et al., 2009; Sorensen et al., 2008). Investigations into the use of telehealth for the delivery of professional nursing interventions (Brennan & Ripich, 1994; Brennan, Moore, & Smyth, 1995; Brennan et al., 2001; Cady, Finkelstein, & Kelly, 2009; Fincher, Ward, Dawkins, Magee, & Willson, 2009; Heyn Billipp, 2001; Wakefield et al., 2008; Zimmerman & Barnason, 2007) demonstrate the feasibility of the approach and the potential for not only social benefits but also improved health outcomes. However, across all of the studies, a persistent theme emerges: the telehealth innovations that work the best are those that complement the existing nursing approaches. Importantly then, this finding calls for an end to isolated telehealth application evaluation and an initiation of more studies in which the telehealth innovation is examined as a component of, not apart from, the nursing intervention (Barnason et al., 2009; Kleinpell & Avitall, 2007; Moore & Primm, 2007).

Josette Jones

TELENURSING/TELEPRACTICE

Telenursing is defined as the use of telecommunication technology to provide nursing services to clients at a distance. Telenursing, a subset of telehealth (see *Telehealth*), combines information technology to support and expand professional nursing practice from its traditional borders by removing time and distance barriers to nursing care (Jones, 2001). Telenursing is an expanding part of health care mainly used to assess care needs, provide advice, support and information, and recommend and coordinate health care resources (Holmström & Höglund, 2007).

Although typically associated with the use of the telephone or facsimile, telenursing provides other potentials for the nursing practice. A small but persuasive set of research projects (Beebe et al., 2008; Ernesäter, Holmström, & Engström, 2009; Hagan, Morin, & Lepine, 2000; Hanson & Clarke, 2000; Hanson, Tetley, & Shewan, 2000; Hayes, Duffey, Dunbar, Wages, & Holbrook, 1998; Jerant, Azari, Martinez, & Nesbitt, 2003; Johnson-Mekota et al., 2001; Kaminsky, Carlsson, Hoglund, & Holmstrom, 2010; Schlachta-Fairchild, Elfrink, & Deickman, 2008; Whitten, Mair, & Collins, 1997; Wootton et al., 1998) identified the important components of nursing care that could be delivered via telecommunications applications, demonstrated the equivalence of technology-mediated assessment with face-to-face approaches, and illustrated the feasibility and potential health benefits of information technology designed to intervene in significant health problems.

The use of telecommunication approaches for clinical assessment, although accepted in northern Europe for wide scale clinical deployment (Ernesäter et al., 2009), shows great promise in assisting nurses in important components of the nursing process, such as assessment, diagnosis, and intervention (Snooks et al., 2008). Telenursing also expanded the practice of nursing across state and international borders, challenging many of the assumptions that have created a state-based system of nursing practice acts and licensing (Holmström & Höglund, 2007; Schlachta-Fairchild, Varghese, Deickman, & Castelli, 2010). In response to telepractice, the creation of a new mechanism for licensure and practice are warranted (American Nurses Association, 1998; Miller & Morgan, 2009). The guiding framework critical to providing safe, competent, and ethical nursing telepractice services is based on the nursing process, and targets improving the nurse-patient connection while embracing the benefits of health care technology innovations.

In sum, the fields of telehealth, telenursing, and telepractice are not mixing information technology and the nursing practice; however, they are incorporating electronic correlates with all professional dimensions of the nursing practice.

Josette Jones

TELEPRESENCE

Telepresence is the use of virtual reality to enter a shared cyberspace graphic environment for the purposes of human communication and interaction, or to become electronically present in a distant real-world environment for the purposes of remote-controlled action and/or observation (Ballantyne, 2002; Hamit, 1993).

In health care, a more restrictive definition of telepresence is applied and is based on robotic technology. A teleoperator with the dexterity matching that of a bare-handed operator can fully perform in a distant environment without a physical presence. The sensory information generated by and within the computer compels a feeling of being present in the distant real world. Throughout the published literatures relevant to the health sciences, the terms virtual presence and telerobotics are used interchangeably.

The venue of the robotic technology, combined with advances in computer technology, have broadened the scope and ability of surgery, especially stereotactic neurosurgery and laparoscopy (Ballantyne, 2002; Ballantyne, Hourmont, & Wasielewski, 2003; Gandsas, Parekh, Bleech, & Tong, 2007; Vespa et al., 2007) as well as truama care in emergency rooms (Daruwalla, Collins, & Moore, 2010). In addition, robotic surgery lends itself to telesurgery, in which surgeons and patients are in remote geographic locations. Nurses have assisted in those surgeries (DeKastle, 2009; Eckberg, 1998; Peck, 1992).

More recently, a shift from a traditional hospital-centered model of care in geriatrics to a home-based model has created opportunities for using telepresence with mobile robotic systems in home telecare (Boissy, Corriveau, Michaud, Labonte, & Royer, 2007; Michaud et al., 2010). Teleoperated mobile robotic systems in the home were found to be useful in assisting multidisciplinary patient care through improved communication between patients and health care professionals, and offering respite and support to caregivers under certain conditions.

The ability of telepresence in health care is a reality, although it is still evolving. The ultimate use of telerobotics remains uncertain; and to date, no nursing practice applications involving human touch have occurred using robotic technology (DeKastle, 2009; Eckberg, 1998; Peck, 1992). The ability to touch patients, change dressings, perform wound care, or hug an elderly patient remain a distant possibility.

Telepresence is a new and challenging aspect being added to the nursing practice. Nurses are expected to take an active role, embrace this technology, and work to maximize its potential for patient care.

Josette Jones

TERMINAL ILLNESS

What is a terminal illness? The term generally is applied to a person with a degenerative process rather than an episode engendered by trauma sustained as a result of some external force. "A person may be regarded as having a terminal illness when broad agreement has been reached among health professionals that there is no longer the possibility of cure and that life-expectancy is limited" (Hughes & Neal, 2000, p. 4).

"When is an illness terminal?" is still a question that both providers and patients may be reluctant to discuss. The emphasis on curative treatment, no matter the diminishing chances for prolonged life, abets the reluctance to label a condition as terminal. Failure to do so, however, may result in dying persons not having the time to attend to the tasks they would wish to, were the reality of their condition openly shared (Gawande, 2010). Interestingly, nurses were more likely to be willing to disclose "bad" news to patients than were physicians (Ben Natan, Shahar, & Garfunkel, 2009). At the same time, with the new emphasis on palliative care at the diagnosis of a life-threatening illness, the potential for such discussions may be enhanced. And unlike hospice care, there is no requirement to forego aggressive treatment aimed at cure. Furthermore, unlike hospice or end-of-life care, palliative medicine is recognized as a medical specialty. As such, the likelihood that this service will be incorporated into treatment is enhanced.

Research in the area of terminal illness has focused on the individual (patient needs, symptom management, and holistic care), family needs (meaning-making, empowerment, anticipatory grief, managing time, and the impact of terminal illness on the family), and system issues (adequacy of care, ethical issues, impact of ethnicity on care, terminally ill patients and research, transfer to hospice and palliative are, and incarcerated terminally ill patients).

A continuing question in the care of those with a terminal illness is the role of food and hydration. For relatives and significant others, food has a symbolic value, connoting nurturing and life and the hope that death will be forestalled. "What if my loved one stops eating/Will my loved one starve" was one of a number of questions that family caregivers wanted to discuss with health care professionals in a study of 33 current and bereaved health caregivers (Herbert, Schulz, Copeland, & Arnold, 2008). Nurses in Taiwan also were influenced by the cultural maxim of "food comes first for people" and thus considered artificial nutrition and hydration as basic care for terminally ill persons (Ke, Chui, Lo, & Hu, 2008). Plonk and Arnold (2005) disaggregate nutrition and hydration, noting that the consensus is that the former is not beneficial to dying persons whereas the latter is controversial. Also controversial is the use of palliative sedation when other means of pain relief are ineffective to relieve intractable suffering (De Graeff & Dean, 2007). Although the previous studies focus on the needs of the dying person, the needs of the families of those who are terminally ill also have been of concern to health care practitioners and of interest to researchers.

The quality of life of the informal caregiver is predicted by their physical health and spirituality (Tang, 2009). Consequently, it is recommended that health care providers pay more attention to the health status of the informal provider. In a grounded theory investigation of the nurse-facilitated empowering intervention of 24 family caregivers of terminally ill patients, it was found that information, education, encouragement, and support were required by these caregivers (Mok, Chan, Chan, & Yeung, 2002). The role of communication is underscored in numerous studies (Marco, Buderer, & Thun, 2005).

Caregivers of terminally ill children, usually parents, present both similar and distinctive issues. Factors that influence how families navigate this terrain include the relationship with health care providers, the availability of information, and the effectiveness of communication between parents (Steele, 2002). Being a good parent by making unselfish decisions for the child was underscored in a recent study (Hinds et al., 2009).

Repeatedly, in the research on caregivers of terminally ill persons, the need for information, communication, and good listening has been stressed (Andershed, 2006). In Norway and Sweden, using 45 forced choice, open-ended questions, researchers found that respondents supported ongoing disclosure of information to terminally ill patients (Lorensen, Davis, Konishi, & Haugen Bunch, 2003). This contrasts sharply with the parts of Europe and Japan where it is the custom to speak with the family rather than the patient. Clearly assessing patient and family preferences with regard to communication is essential.

In research on the subject of the experiences of the terminally ill person, caregivers often serve as the source of information about the end-of-life experience of their family member. Quality of care and satisfaction with care are measured by reports of family members regarding the patient's experience. Hinton's (1996) reinterview of 71 relatives showed that there is variable agreement with earlier statement made by these same individuals. This raises a question about the validity and reliability of such measurement when used to indicate the satisfaction with care of the terminally ill person. At the same time, there is no easy answer as to how satisfaction with care of terminally ill persons is to be measured, given the fragile condition of persons nearing the end of their lives.

Research with the terminally ill, as with other patients, demands the calculation of a risk/benefit ratio. In this case, the research may not benefit the individual participant but it may be of benefit to future terminally ill persons. Given the condition of terminally ill persons, qualitative research has been favored as a method of inquiry. That leaves the question of the generalizability of the results; quantitative methods are important for future studies. Kirchhoff and Kehl (2007) and Schulman-Green, McCorkle, and Bradley (2009) discuss some of the challenges in patient recruitment and research methodology for end-of-life research As the research results accumulate, the translation of the research findings into practice will enhance the care of the terminally ill.

With the introduction of palliative care earlier in the disease process, questions of compensation inevitably occur (De Fanti, 2010). As with hospice care, the question arises as to whether the organization of the care is directed to containing the costs of care or meeting the needs of the patient and family. If the latter is not achieved, there will be reluctance to accept such services.

Finally, is palliative care beneficial for the patient? A study by McKechnie, MacLeod, and Keeling (2007) explored the dying process of seven women with carcinoma receiving palliative care using qualitative research methodologies. Uncertainty throughout the diagnostic and treatment process as well as their freedom from distressing symptoms marked their experience. "Living until you die" was not achieved for these research participants. In addition, with withdrawal from usual activities, dying persons experienced a form of "social death." The authors conclude that "whether one has a 'good death' or not is determined not only by the progression and management of the disease process by health professionals, but also by the way in which one is perceived by self and others" (p. 264). With social death, the terminally ill will be dead to themselves and others prior to their physical death. If such is the case, caregivers, both informal and professional, will have failed in their care of the terminally ill.

Inge B. Corless

THEORETICAL FRAMEWORK

A theoretical framework is a group of statements composed of concepts related in some way to form an overall view of a phenomenon. As constructions of our mind, theoretical frameworks provide explanations about our experiences of phenomena in the world. The explanations provided by theoretical frameworks are of two types: descriptive (understanding the interaction among a set of variables) or prescriptive (anticipating a particular set of outcomes; Dubin, 1978). The term *theoretical framework* often is used interchangeably with the terms *theory*, *theoretical model*, and *theoretical system*.

Theoretical frameworks consist of the following components: (a) concepts that are identified and defined, (b) assumptions that clarify the basic underlying truths from which and within which theoretical reasoning proceeds, (c) the context within which the theory is placed, and (d) relationships between and among the concepts that are identified. Theoretical frameworks serve as guides for practitioners and researchers in that they organize existing knowledge and aid in making new discoveries to advance nursing practice.

The scientist focuses on making the empirical world and the theoretical world (represented by theoretical frameworks) as congruent as possible. Linkages between the theoretical world and the empirical world to which it applies are made through the formulation and testing of hypotheses. Theoretical frameworks are developed and tested through theory-linked research. Theory-generating research is designed to discover and describe concepts and relationships for the construction of theory. Once theory is constructed, theory-testing research is used to validate how accurately the theory depicts empirical phenomena and their relationships.

Generation of theoretical frameworks in nursing has followed an evolutionary process. Initially, nursing grappled with defining theory for a developing discipline. In the 1960s and 1970s, early nurse theorists attempted to answer questions, such as (a) around what phenomena do nurses develop theory? (b) What are the things nurses think about and take action on? (c) What are the boundaries of the discipline? In response to these questions, a proliferation of conceptual models and philosophies of practice of nursing were developed. These nursing conceptual models are considered at the grand theory level, examples of which are the theories of Johnson, Roy, Neuman, Rogers, and Watson.

The discipline also addressed the question of how to develop theory for nursing and proposed definitions emphasizing the structure, purpose, and use of theory. Nurse scientists and theorists debated methods of developing theory, including reformulation of borrowed theories and development of unique nursing theories based on quantitative and qualitative research. These discussions led to the acceptance of multiple approaches to theory development in nursing, including both inductive and deductive methods. Recent attention has focused on the need to develop knowledge about the substance of nursing. Middle range theories that focus on the clinical processes in nursing are being developed. Examples of middle-range theoretical frameworks are Mishel's theory of uncertainty in illness, Pender's theory of health promotion, Smith's story theory, and

Lenz and colleagues' theory of unpleasant symptoms.

Shirley M. Moore

THERMAL BALANCE

Thermal balance is defined as a thermal "steady state" in which the loss of body heat is equal to the heat gain. In health, this balance produces a thermoneutral state, optimal for cellular function. In humans, this state averages about 37°C ± .05 for internal temperatures and 33.5°C ± .05 for skin. Variations in body temperature respond to both homeostatic and circadian influences (Holtzclaw, 2001). Circadian rhythm of core temperature is regulated by a remarkably stable endogenous "clock," which has helped to make it the most widely used circadian indicator. There is evidence that circadian rhythms begin in fetal development but there is also research support for maternally derived prenatal and postnatal influences on rhythm (Weinert, 2005). The tendency of older people to go to bed and wake up earlier than younger people has generated studies with a lack of consensus about whether a phase advance (shifted earlier) of circadian rhythms occurs in later life (Yoon et al., 2003), Hypothalamic thermoregulatory controls keep internal temperatures fairly stable, despite environmental changes and the propensity of heat to escape to cooler regions. Metabolic and physical activity continually generates heat, even as it is constantly lost to the cooler environment. Current theory is that elaborate thermoregulatory control systems maintain temperatures within the optimal set point range. Compensatory cooling or warming mechanisms respond to deviations above or below this range. Temperatures rising above this range evoke vasodilation and sweating, whereas falling temperatures cause vasoconstriction, shivering, and increased metabolic activity. Each physiological response augments or inhibits the transfer of heat by affecting the thermodynamics of conduction, convection, radiation, and evaporation. Vasodilation warms the skin where heat is more easily lost to air, contact surfaces, or liquids. Vasoconstriction creates a poorly perfused insulative layer of tissue that conserves heat. In infants, cold exposure causes metabolic breakdown of *brown fat* to generate heat. In older children and adults, the primary means of heat generation is shivering.

Nurses have recognized the importance of assessing thermal balance as a vital health indicator for as long as the profession has existed. Body temperature provides an important *vital sign* of metabolic, neurological, and infectious activity. Circadian rhythms, monthly cycles, and daily body temperature ranges are assurances of healthy variations. The pregnant mother provides heat exchange both for herself and the fetus; therefore, high maternal body temperatures, from fever, hyperthermia, or prolonged "hot tub" use, put the unborn infant at risk for neurological damage. Temperature elevations in the acutely ill and injured may indicate either fever or hyperthermia. Each has its own dynamics and treatment. Fevers are manifestation of the host response to pyrogens and are usually self-limiting. By contrast, thermoregulatory control is lost during hyperthermia and requires aggressive cooling treatment. Temperatures above 42°C can cause irreversible neural cellular damage. Conductive cooling blankets, ice packs, and cooling fans are used to lower core temperatures. In immunosuppression associated with cancer treatment, fevers may indicate fulminating systemic infection. However, the immunosuppressed HIV-infected patient may become febrile from high cytokine levels, without obvious secondary infection. In both groups, constant assessment of other indicators is necessary to rule out infection.

Situations that promote heat loss or interfere with heat generation put patients at risk for hypothermia. The neonatal nurse must be extremely sensitive to the low-birthweight infant's need for external heat source. Unable to shiver, the neonate expends oxygen to metabolize brown fat and can easily become hypoxic from cold exposure. Declining metabolic and vasomotor activity makes older persons particularly susceptible to heat loss during surgery, trauma, or outdoor exposure. Hypothermic states can destabilize thermoregulatory function further, eventually leading to death.

Since early times, fever patterns have provided a key indicator for detecting the onset and progress of infections. Concern that high temperatures could cause irreversible brain damage led nurses to routinely cool patients with rising body temperature using ice packs, cooling sponge baths, or circulating fans, regardless of the temperature elevation's cause. In the 1970s, nurses used conductive cooling blankets with refrigerated circulating coolant to appropriately treat refractory hyperthermia in which thermoregulatory cooling responses are impaired. However, in treating fever, in which thermoregulation remains intact, sharp gradients between skin and core temperatures stimulated vigorous and distressful shivering. Interventions to prevent shivering were among the earliest to be tested by nurses. Interest in and awareness of temperature variations became more acute among nurse researchers when advanced technology in thermometry was introduced to clinical settings. Hemodynamic monitoring systems with thermistor probes first made pulmonary artery temperature measurement possible in critical care settings in the 1970s. The availability of clinically made bladder, tympanic membrane, and skin temperature probes led to numerous studies of gradients between body regions and measurement sites. Variation in quality and precision of instruments made studies of reliability and accuracy important. Recognition of *malignant hyperthermia*, a rare but lethal genetically linked disorder occurring when susceptible persons receive anesthetic agents, led to closer surveillance of perioperative body temperature. This precaution reduced mortality from hyperthermia in this uncommon condition, but also brought to awareness the high incidence of *low* body temperatures in most surgical patients. Increased survival of preterm infants in the 1970s created increased concern for thermal balance of vulnerable infants. Studies of environmental influences, warming devices, and skin-to-skin contact were made possible by sophisticated continuous skin temperature monitors.

Temperature measurement issues continue to dominate clinical nursing research, stimulated by the commercial development of new technologies in thermometers. Erickson (1999) and McKenzie and Erickson (1996) were among the first to compare oral, skin, rectal, and tympanic membrane measurement sites as well as methods of thermometry in children and adults. Findings reassure nurses that oral measurement provided reliable intermittent thermal assessment in afebrile patients. Newer research studies have reaffirmed this in community-dwelling older adults (Lu, Dai, & Yen, 2009). Although placement site and method of insertion yield statistically significant differences, they are of less importance clinically. Erickson's work was set apart from other contemporary studies by her appropriate statistical treatment beyond simple correlations and by meaningful interpretation of device reliability, accuracy, and linearity. In the past decade, nurse researchers began drawing inferences from observed relationships between thermal changes and other variables. Gradients between skin and core temperatures initiate thermoregulatory responses (see entry on *Shivering*). Studies have shown the importance of thermal gradients and rate of cooling in initiating shivering in a comparison of cooling blanket temperatures (Caruso, Hadley, Shukla, Frame, & Khoury, 1992; Sund-Levander & Wahren, 2000). Nursing research has also tested methods to alleviate adverse effects of warming and cooling in patients of all ages. Particularly vulnerable are the preterm infant, the elderly, and patients recovering from surgery, cardiopulmonary bypass, or traumatic injury. Research-active members of the American Society of PeriAnesthesia. Nurses improved nursing standards and policy recommendations through their research efforts to promote normothermia in the perioperative area (Hooper, 2009; Hooper et al., 2009; Pikus & Hooper, 2010). Anderson et al. (2003) pioneered "kangaroo care" as a method of maintaining thermal balance in preterm and term infants. Drawn from perinatal practices in Western Europe, this method uses skin-to-skin care for infants held against the skin under the mother or father's clothing. Self-demand breast-feeding and lactation were promoted by close constant maternal contact (Hake-Brooks & Anderson, 2008). The method was found feasible and beneficial, even in infants that were mechanically ventilated (Swinth, Anderson, & Hadeed, 2003). Relationships between the infant's body temperature and environment, circadian rhythm, and parental co-sleeping have been investigated (Thomas & Burr, 2002). Several studies have compared the effectiveness of cooling interventions in febrile adults with similar findings (Caruso et al., 1992; Henker et al., 2001). Most concluded that antipyretic drugs are as effective as cooling without inducing distressful shivering. In a controlled trial with febrile patients with HIV disease, insulating skin against heat loss actually kept peak febrile temperatures lower (Holtzclaw, 1998). Although numerous small studies in nursing have tested various products that cool febrile patients or restore heat loss in perioperative patients, they are often empirical in nature. By contrast, the investigations mentioned above are theoretically based on the principles of thermodynamics and physiological responses. They seek to explain mechanisms, predict consequences, and alleviate the hazards of altered thermal balance.

Some of the newer areas of investigation conducted by nurse scientists related to thermal balance are studies using animal models to demonstrate the effects of exercise on thermoregulatory responses (Rowsey, Metzger, & Gordon, 2001) and fever (Richmond, 2001; Rowsey et al., 2009), and circadian influences on thermoregulation in obesity (Jarosz, Lennie, Rowsey, & Metzger, 2001) As more nurses enter the fields of genetics, immunology, and molecular biology, they will play important roles in seeking origins and mechanism of thermoregulatory responses. New avenues for nursing research in thermal balance emerge as new situations of vulnerability develop and measurement techniques are advanced. At particular risk is the rapidly growing population of the frail elderly who are at risk of heat-related illnesses in extremely hot weather and hypothermia associated with cool climates and exposure. Declining metabolic rate, lower vasomotor sensitivity and diminishing insulation from body fat contribute to vulnerability to extremes in heat or cold. The existence and treatment of thermoregulatory failure in home-bound patients is an area that nursing has not yet systematically studied. Improved survival of individuals with neurological, vasomotor, and endocrine impairments and with extensive burns creates new situations in which thermal balance is altered. Only recently have nurses begun to investigate the relationships between the circadianicity of body temperature and the effectiveness of other therapies. Study and intervention are needed in addressing thermal balance, thermal perception, and thermal comfort during a variety of life events and health alterations.

Barbara J. Holtzclaw

TIME SERIES ANALYSIS

Time series analysis and statistical time series models are basic to describing and studying change in human responses and behavior.

They are appropriate to cyclical patterns as well as periodic or systematic variance across time. Outcomes of nursing care are generally quantified by measures of response changes across specified periods of time: improvement or declines in health status, increase or decrease in strength or endurance are a few examples. Although these changes are often treated as simple, linear processes, the rate and degree of linear variation in outcome variables are often confounded by related or underlying predicable patterns of fluctuation, Thus, whereas time series statistical models are an appropriate and powerful methodology for analysis of intraindividual differences in predictable patterns of change, they can also be used to identify recurring patterns of variation that are confounding the rate and degree of intervention success.

In contrast with inferential statistical models, in which aggregate data are generalized to describe changes in human behavior, time series analysis uses individual patterns of change to predict future behavior. Thus, the subject is a unitary entity or system whose behavioral state can be isolated within a given point and measured through a specified window of time. Allowing subjects to act as their own controls eliminates the random heterogeneity of response threat to inferential statistical validity; but limits statistical external validity. Generalization of time series findings requires repeated replications in conceptually congruent others.

For the purpose of time series analysis, the singular system can be defined at many different levels of complexity and inclusiveness. However, because 50 observations across the specified time period is the conventional minimal number of observations necessary for the accurate identification of predictable patterns of behavior, pragmatism often limits subjects for time series nursing research to the often more reliable physiological and directly observed behaviors of individuals, for example, cardiovascular responses to a cardiac stressor, rather than equally legitimate, social or behavioral response patterns of individuals, families, communities, health care systems, or political institutions.

The characteristic feature of time series analysis is that the phenomenon to be studied has a distinctive temporal component—the behavioral state will vary predictably with the passage of time. Obviously, the passage of time cannot be manipulated, thus, differences in patterns of change are not a direct function of time. Instead, time is the necessary temporal frame or marker in any time series analysis study. Although not conceptually an independent variable, time assumes that role in univariate time series statistical models. Time series studies can be either univariate or multivariate. However, a time series variable always consists, by definition, of a series of observations that occur in temporal order. Thus, multivariate time series analysis is accomplished by identifying the relationship between or among two or more pairs of univariate time series.

Unlike inferential statistical models, time series data points are not intended to be independent of one another. Each value is highly correlated with every successive value. Thus, any observation in a time series has significantly less individual predictive significance than its inferential counterpart. In time series analysis, predictive power is not a direct function of sample size. Instead, predictive power depends on an accurate hypothesis of the internal temporal structure of the phenomenon, selection of a sampling time window of sufficient length to capture multiple expressions of the change being studied, and identification of a sampling frequency that will adequately capture all critical phases of the evolving pattern.

Although change in behavior is an essential characteristic of many of the phenomena of interest to nursing science, the use of statistical time series models is not always appropriate or feasible. However, although time series analyses are complex and costly, they permit nurse scientists to more completely examine and evaluate trends, cycles, and patterns of change that are framed within predictable spaces of time or could affect rates and degree of treatment effectiveness.

Bonnie L. Metzger

TRANSITIONAL CARE

Changes in health care delivery and aging of the population during the past 30 years have placed patients increasingly at risk for adverse events during transitions in care. As a result of decreased length of stay during acute care episodes, changes to payment systems, and fragmentation among providers across settings, U.S. health care has developed into an overly complex system. Additionally, patients are living longer, have increased incidence and prevalence of chronic conditions, and require more complex care (Institute of Medicine, 2001; Pham, Grossman, Cohen, & Bodenheimer, 2008). Transitional care, defined as a set of actions to ensure the coordination and continuity of health care as patients transfer between different locations or different levels of care within the same location, is essential to ensure the coordination and continuity of health care. Locations for transitional care may include hospitals, subacute and postacute nursing facilities, the patient's home, primary and specialty care offices, and assisted living and long-term care facilities (Coleman & Boult, 2003). Studies investigating nurse-directed, multidisciplinary, multidimensional interventions have demonstrated the potential for effective transitional care to improve quality and decrease health care costs for older adults at risk for poor outcomes (Harrison et al., 2002; Naylor et al., 1994, 1999, 2004; Schnipper et al., 2009; Stewart, Marley, & Horowitz, 1999). The transitional care model (TCM), developed at the University of Pennsylvania School of Nursing, has demonstrated effectiveness in three randomized trials for older adults who are at risk for adverse events and, thus, will be the focus of this entry.

In 1981, a team at the University of Pennsylvania School of Nursing recognized the need to develop a multidisciplinary model of transitional care led by master's prepared advanced practice nurse specialists (clinical nurse specialists or nurse practitioners) to meet increasing health care costs, decreasing acute care length of stay, and increasing fragmentation of health care (Brooten et al., 2002). This model was initially designed to deliver care to vulnerable low–birth weight premature infants. The quality cost model of advanced practice nurse transitional care, herein termed TCM, was subsequently tested with other vulnerable populations including women who had unplanned cesarean births, pregnant women with hypertension and diabetes, and the elderly. The elderly, who represent a high-cost, complex population with multiple chronic illnesses, is a vulnerable population who has demonstrated the potential to benefit from transitional care (Murtaugh & Litke, 2002; Naylor, 2000, 2004; Naylor et al., 1999; Naylor & Van Cleave, 2010).

Research has helped to define and identify the core components of effective transitional care. These evidence-based practices include screening for high-risk patients in need of transitional care services, elucidating patients' and caregivers' goals and preferences, facilitating communication among providers and across settings regarding the essential components of the plan of care, educating patients and caregivers regarding prevention, early identification, and response to worsening health problems, and placing highly skilled nurses throughout the transitions to address patients' complex needs and promote continuity of care (Naylor, 2006, 2010).

By incorporating these core components, the TCM has thus demonstrated effectiveness in three randomized trials for older adults who are at risk for adverse events. These three studies have generated results showing reductions in preventable hospitalizations for primary and coexisting illnesses, improvement in health outcomes after discharge, enhanced patient satisfaction, and reduction in total hospital costs.

The first randomized clinical trial, conducted in 1994, demonstrated that transitional care has the potential to decrease rehospitalizations, number of hospital days, and total charges among 276 older medical and surgical cardiac patients aged 70 and older (Naylor et al., 1994). Patients were randomized to receive either a comprehensive discharge planning protocol specifically developed for elders and implemented by geriatric clinical specialists, or to a control group who received the hospital's routine discharge plan. The results demonstrated that the intervention medical patients had significantly decreased readmissions during the first 6 weeks (95% confidence interval [CI] = 25% to –1%, $p = .04$). Total rehospitalization days were fewer for the medical intervention group than for the control group 2 weeks after discharge ($p = .002$) and between 2 and 6 weeks after discharge ($p = .01$). Total charges for health care services after discharge for the medical intervention patients were $295,598 less than the control group at 6 weeks ($p = .02$; Naylor et al., 1994).

Results generated from the second clinical trial suggested that the TCM significantly decreased readmissions, hospital days, and costs among 363 medical or surgical hospitalized elders ages 65 and over (Naylor et al., 1999). Patients were randomized to either an advanced practice nurse–centered discharge planning and home follow-up intervention, or to a control group who received routine discharge planning. At 24 weeks, the intervention resulted in fewer total hospital readmissions after the index hospitalization (intervention = 49 vs. control = 107; rank sum test, $p < .001$), decreased hospital days (intervention = 270 days vs. control = 760 days; $p < p < .001$), and lower reimbursement costs for readmissions, acute care visits, and home visits were significantly decreased in the intervention group (intervention = $642,595 vs. control = $1,238,928; $p < .001$). Time to first readmission for any reason was increased in the intervention group (log-ranked $\chi_1^2 = 11.1$, $p < .001$; Naylor et al., 1999).

The third clinical trial demonstrated potential for the TCM to decrease readmissions or death, decrease mean total costs, increase quality of care, and increase patient satisfaction in 239 patients, ages 65 years and older, hospitalized with heart failure (Naylor et al., 2004). Patients were randomized to receive a 3-month advanced practice nurse–directed intervention or control group who received routine patient management, discharge planning, and standard home agency care if referred. Time to first readmission or death was longer in intervention patients (log-ranked $\chi^2 = 5.0$, $p = .026$, Cox regression incidence density ratio = 1.65, 95% confidence interval = 1.13–2.40). At 52 weeks, intervention patients had fewer readmissions (104 vs. 162, $p = .047$) and lower mean total costs ($7636 vs. $12,481, $p = .002$). The intervention group also reported short-term improvements in overall quality of life (2 weeks, $p < .01$; 12 weeks, $p < .05$) and patient satisfaction (2 and 6 weeks, $p < .001$; Naylor et al., 2004).

Ongoing research is directed toward translating evidence into practice and extending transitional care into other populations. The team at the University of Pennsylvania has formed a partnership with leaders of the Aetna Corporation to translate and integrate the TCM for use in everyday practice and promote widespread adoption of the model by demonstrating its effectiveness with a high-risk Medicare managed-care population in the mid Atlantic region. The evidence from this partnership is currently in analysis. The key lessons, however, from translating research to practice, are the need to identify strong champions, fit with the organization, engage key stakeholders, remain flexible, assess and know the external climate, strategize the marketing of the innovation to others, establish milestones, and measure success (Naylor et al., 2009).

Other ongoing work involves testing the efficacy and effectiveness of transitional care among other older vulnerable populations. The University of Pennsylvania team is exploring the TCM among hospitalized, cognitively impaired elder adults (National Institute on Aging, R01AG023116; Marian S. Ware Alzheimer's Program, 2005–2010). The primary goal of this project is to assess the clinical and economic outcomes achieved by nurse-led interventions of varying intensities, each designed to improve transitions in care for these patients and their caregivers. Another ongoing study, *Health Related Quality of Life: Elders in Long-term Care*, (National Institute on Aging and the National Institute of Nursing Research, R01AG025524, Marian S. Ware Alzheimer's Program, 2006–2011), is the first attempt to document the experiences of frail elders, including those with cognitive impairment, as they meet very challenging care transitions in long-term settings, for example, community-based (participant's homes) assisted living facilities or in nursing homes (Naylor & Van Cleave, 2010).

In conclusion, the growing complexity in both the patient population and health system will continue to challenge U.S. health care delivery, necessitating a continued need for transitional care services. The Patient Protection and Affordable Care Act, signed into law by President Obama in March 2010, contains a provision for community-based care transition programs targeting high-risk Medicare patients with cognitive impairment, depression, history of multiple readmissions, and unspecified chronic illnesses to be determined as the law is implemented (U.S. Congress, 2010). Continuing research efforts, identifying community settings and partnerships, and translating evidence into practice, therefore, must continue to advance the science of quality, affordable transitional care for vulnerable populations.

Janet H. Van Cleave
Mary D. Naylor

TRANSITIONS AND HEALTH

Nursing has had a sustained and ever-growing interest in transitions and health for more than 40 years. During this time, conceptual models have been developed, elaborated, and refined (Chick & Meleis, 1986; Schumacher & Meleis, 1994). Middle-range and situation-specific theories have been developed (Im & Meleis, 1999; Meleis, Sawyer, Im, Messias, & Schumacher, 2000). Research-based evidence has demonstrated the benefits of transitional models of care for individuals and health systems (Naylor, 2002). Increasingly, theory, research, policy, and practice are integrated into a comprehensive scholarship of transitions and health. The establishment of the New Courtland Center for Transitions and Health at the University of Pennsylvania School of Nursing is a milestone in this regard.

Transition is defined as a passage between two relatively stable periods of time. In this passage, an individual moves from one life phase, situation, or status to another (Chick & Meleis, 1986; Schumacher, Jones, & Meleis, 1999). The need for nursing care is so often precipitated by a transition that transition is a concept central to the discipline of nursing (Meleis & Trangenstein, 1994; Kralik, Visentin, & van Loon, 2006).

Transitions are processes that occur over time. They are initiated by significant marker events or turning points that require new patterns of response. Transition processes encompass the period of time from the first anticipation of transition until a new identity is formed at the conclusion of the transition. Transitions often are conceptualized in terms of stages in order to capture their movement and direction as they evolve over time. A classic description of transition stages is found in Bridges (1991) work. He identified three stages: (a) a period of ending or disconnectedness from what had been there before, (b) a neutral period characterized by a sense of disruption and disorientation as well as discovery, and (c) a period of new beginnings in which the individual finds new meanings and a sense of control and challenge. Transitions also can be conceptualized in terms of critical periods. Critical periods are turning points that can lead to either healthy or unhealthy outcomes.

The transition process takes place within the context of an individual's history, present circumstances, and future possibilities. A sense of disconnectedness from one's familiar world may occur during transitions. A sense of loss or alienation from what had been familiar and valued may also occur, along with fundamental changes in one's view of self and the world. Ultimately, individuals experiences changes in identity, roles, and patterns of behavior during a transition. New knowledge and skills, new roles, new relationships, and new coping strategies must be developed.

Nursing scholarship focuses on many types of transitions, including developmental, situational, health/illness, and organizational transitions (Meleis, 2010). Developmental transitions that nurses frequently encounter include the transition into motherhood, the menopausal transition, and the aging transition, among others. Situational transitions include hospital discharge, relocation, immigration, and education. Health/illness transitions include movement from one phase of a health and illness trajectory to another, such as diagnosis, recovery, rehabilitation, lifestyle change, and development of self-care abilities. Organizational transitions include changes in environments for nursing, initiated by changes in leadership, policies, procedures, practices, and technologies. Structural reorganization and new programs also initiate transitional processes within organizations.

Nurse researchers have investigated these types of transitions in an ever-increasing range of populations, including women, older adults, individuals living with heart failure, diabetes, cancer or rheumatoid arthritis, students, and practicing nurses (Meleis, 2010). An increasing emphasis on transitions in culturally diverse populations is evident as well, including Chinese, Mexican, Taiwanese, and Saudi Arabian populations. The rapidly growing scholarship on diverse international populations experiencing transitions demonstrates the centrality of the concept of transition for nursing worldwide.

Underlying the current interest in transitions and health are global societal changes occurring with unprecedented rapidity (Meleis, 2010). Some are the result of technological developments, such as the ease with which information and communication flows around the world. Others are the result of wars, disasters, recessions, and dislocation. These events precipitate transitional processes that reach well beyond the individuals directly experiencing them. Global transitional processes may last for an extended period of time and impact health and well-being on a long-term basis. Far-reaching changes during global societal transitions have profound effects on organizations and populations alike.

Persons in transition experience a wide range of health-related responses. They may experience losses or gains, be more or less aware of being in transition, suffer from physical debilitation, have lower or higher immune responses, feel an emergence or loss of spirituality, discover new meanings, or experience traumatic stress symptoms. Outcomes indicating healthy responses to transitions include a sense of meaning, subjective well-being, the development of a new identity, mastery of new roles, well-being in relationships, harmony with the environment, renewed energy, optimal physical and mental health and functioning, and positive quality of life. Adverse outcomes include marginalization, inability to separate from past identities and ways of functioning, inability to make decisions, ongoing role insufficiency, isolation, and protracted duration of the transition process. Previous life patterns may be maintained that are incongruent with the demand for new identities and life patterns (Chick & Meleis, 1986; Schumacher & Meleis, 1994).

A primary goal of nursing is to facilitate healthy transition processes and outcomes (Meleis & Trangenstein, 1994). Ongoing knowledge development focuses on strategies that nurses use to prevent unhealthy transitions, to support individual and family well-being during transitions, and to promote healthy outcomes at the conclusion of the transition process. Models of care developed by nurses to assist clients during a transition include transitional care, role supplementation, and debriefing (Meleis, 2010). The transitional care model is a model of choice for older adults and those with chronic conditions. Nursing strategies include ongoing assessment, coaching, and interdisciplinary collaboration (Naylor, 2002; Naylor et al., 2009). The role supplementation model involves a partnership in which a nurse with knowledge, skill, and experience with a role (e.g., parenting, caregiving, or chronic illness management) assists an individual new to the role in acquiring the necessary knowledge, skill, and experience. This is a dynamic partnership in which the nurse steps in when supplementation is needed and steps back as the partner becomes able to manage independently (Meleis, 1974). Debriefing includes reflection, dialogue, recreating situations, and reminiscing. It is a strategy to enhance awareness of the meaning of a transition and to cope with its implications (Steele & Beadle, 2010).

Despite progress in developing and testing nursing interventions to assist individuals during transitions, much additional knowledge development is needed in this area. For example, identification of transition outcomes most sensitive to nursing interventions is needed. Interventions specific to different transition stages, critical periods, and milestones need to be developed. Interventions tailored to the needs of specific populations are also needed.

A new direction for scholarship on transitions and health is translational research. Translational research is needed to move knowledge from the controlled environment of research to the real-world environment of clinical practice. Collaboration on many fronts will best facilitate this work. For example, collaboration with health care administrators and advanced practice nurses is needed to effect changes in health care delivery across the continuum of care, ranging from large health systems to long-term care to home care and nurse-managed community clinics. Collaboration with experts in policy development is needed to align clinical practice patterns and reimbursement mechanisms with nurse-led transition interventions. Such collaborations provide opportunities for linking research with improvements in health care quality. For example, Naylor et al. (2009) are collaborating with a large U.S. insurance organization to develop policies, procedures, and reimbursement mechanisms to give patients access to a transitional care model that was developed and tested in a large, long-standing program of research.

In summary, more than 40 years of theory development and research about transitions and health has resulted in an extensive knowledge base, which provides a foundation for future intervention and translational research. Emerging new directions include integrating theory, research, policy, and practice into a comprehensive approach to scholarship with global, real-world applications.

Afaf Ibrahim Meleis
Karen L. Schumacher

TRANSLATIONAL RESEARCH

The wonderful thing about translational research is that everyone knows exactly what it means—the only trouble is that none of them have the same definition and it is interpreted in a range of ways (Levine, 2007; Newby and Webb, 2010). Translational research is often referred to as "bench-to-bedside" and further explained in several ways: using new knowledge produced as a part of the science of discovery and applying that knowledge to improve health and health care, or the application of new and unproven laboratory discoveries to improve health, or research that explores and develops potential treatments and tests the safety and efficacy of those treatments in randomized control trials. These definitions of translational research are referred to as T1 translation (Agency for Healthcare Research and Quality, 2000).

However, a second definition or type of translational research, referred to as T2 translation (Agency for Healthcare Research and Quality, 2000), investigates how the newly discovered science can be applied to real-world clinical settings. Even when a drug, test, or treatment is found safe and efficacious in the randomized control trial, further research on the use of that drug or treatment in a typical clinical practice or setting is necessary. The setting for this type of translational research is the organization, clinical practice, or community, and it requires a different set of research skills. Sometimes now referred to as implementation science (Titler, 2004a), this translational research evaluates interventions in the clinical setting using information technology, epidemiology, organizational theory, change theory, adult learning theory, behavioral science, marketing theory, social cognitive theory, social ecological theory, and social influence/communication theory to further a better understanding of organizational variables that affect the translation of evidence into practice.

Calling both T1 and T2 programs of research "translational research" has been a source of confusion to many. T1 and T2 face different research challenges including the recruitment of subjects, homogeneous samples versus diverse samples/populations, rigor of the research methods particularly the ability to control the intervention versus an inconsistent or convenient application of the intervention, the identification and measurement of outcomes, the choice of statistical analyses, and the ability to generalize findings.

In an attempt to address methodological issues and to improve translational research methods, Glasgow (2009) discussed the need for translational research designs to consider four critical research issues that relate to the ability to generalize findings from translational research:

1. Use of a heterogeneous population—samples must be purposively selected to represent the real world and include representativeness of age, gender, ethnicity, and health literacy that have all been associated with inequity in health care.
2. Use of multiple settings—the research must include a range of settings that represent a typical practice.
3. Use of comparison—well-designed comparisons that include the current standard of care to an alternative rather than placebo or no treatment.
4. Use of multiple outcomes—include multiple outcomes that are relevant to decision makers and policy makers including cost, benefit, quality of life, and impact measures.

It is widely recognized that the gap between research findings and practice is a concern for all health care practitioners, and many countries are investing in providing resources to increase and support translational research (Canadian Institutes of Health Research, 2009; Cooksey, 2006; National Institutes of Health, 2009; Woolf, 2008). At a time when experts warn of the fragmented health care system and a widening "chasm" in access, quality, and disparities, interventions to close these gaps—the work of T2—may do more to improve outcomes than the discovery of yet another new imaging device or additional drug (Institute of Medicine, 2003; McGlynn et al., 2003; Woolf, 2008). The Clinical and Translational Science Awards program, a part of the National Institutes for Health's effort to catalyze the development of clinical and translational science, was developed to assist institutions take a unique, transformative, and integrative academic approach to translational research (National Institutes of Health, 2010). Focusing on the second area of translational research, these programs seek to close the gap and improve quality by improving access, reorganizing and coordinating systems of care, helping clinicians and patients to change behaviors and make more informed choices, providing reminders and point-of-care decision support tools, and strengthening the patient-clinician relationship (National Institutes of Health, 2010).

In October 2003, a 2-day invitational conference was held at the University of Iowa to discuss the future of translation science in advancing systems to support quality nursing care called "Advancing Quality Care through Translation Research." The conference used a definition of translation research that has since been used in nursing research: "the scientific investigation of methods, interventions, and variables that influence adoption of evidence-based practices (EBPs) by individuals and organizations to improve clinical and operational decision making in health care. This includes testing the effect of interventions on promoting and sustaining the adoption of EBPs" (Titler, 2004b). The conference developed a consensus around the importance of translation of evidence and in the summary article of the conference, Fraser (2004) captured the discussion: "The successful impact requires, at a minimum, a strong evidence base, a well-designed intervention and implementation strategy that takes into account the structure, culture, and capacities of the organization itself and, if necessary, succeeds in modifying these as part of the intervention, and a supportive or at least neutralized external environment. To move from single studies to broader impact, therefore, one will need to increase synergies across studies, bring in the organizational component, consider and potentially modify the impact of reimbursement, regulation, and other environmental factors, and look at ways to take findings to scale" (Fraser, 2004). This is still our challenge today in translational research.

A third type of translational research, or T3, has been described in the literature and is necessary to evaluate the ongoing and complex environmental and policy measures that affect sustainability of clinical strategies that have been found safe and efficacious and have successfully been implemented (Lean, Mann, Hoek, Elliott, & Schofield, 2008). The Agency for Healthcare Research and Quality developed the Partnerships for Quality program to accelerate the translation of research findings into practice on a broad scale through public/private partnerships led by organizations well-positioned to reach end-users and maintain the consistency of emerging evidence across the health care system (Donaldson et al., 2007).

There are interesting examples of translational research in the literature, but most focus on only one type of translational research discussed above. To further understand the continuum of translational research, the following example will show how an innovation in health care, a scientific discovery, can be applied and evaluated to improve outcomes in the care of a patient with congestive heart failure (CHF). A T1 translation research study would first test a new drug or treatment that has been found to be safe and efficacious in previous discovery and design a randomized control trial to test that drug or treatment in a specific population/sample, for example African American male CHF patients between 40 and 50 years of age in one clinic in a large suburban primary care practice. If the drug was found to be effective, the research team would evaluate the effectiveness of implementing this drug or treatment for a broader population, such as all CHF patients in that practice and several other practices around that city who admit their patients to a similar hospital. The T2 translational research study would be designed to determine the best strategies (educational, marketing, e-mail, phone, mailings, and meetings) to communicate the success of this drug or treatment in CHF to all practitioners in the area and to increase the practitioners' compliance implementing the new evidence, theoretically, to close the quality chasm. Finally, a T3 translational research study would be designed to study how the inclusion of this new drug or treatment in CHF guidelines of care could be sustained and become a nationwide standard of care for all CHF patients. A program, such as the American Heart Association's *Get with the Guidelines*, is a prefect example of a program to use to disseminate the new evidence. The T3 research would focus on the strategies to implement the program to sustain compliance nationwide using the new drug or treatment as part of the coronary artery disease secondary prevention treatment guidelines to be implemented for CHF patients by the time of hospital discharge. What is often referred to as "distilling evidence" through the implementation of guidelines for care helps take evidence to all practitioners to improve the outcomes of care.

Kathleen M. White

TRIANGULATION

Triangulation, as it is most commonly used in nursing research, refers to the combination of qualitative and quantitative research methods within a single study. There are a number of approaches to triangulation, and it can serve a number of purposes. The term triangulation has its roots in surveying and navigation, and describes the idea of using known points and angles in a triangular fashion to locate an unknown point.

There are four different approaches to triangulation: methodological, data, theoretical, and investigator. Methodological triangulation, currently the most commonly used triangulation approach in nursing research, involves the use of two or more different methods within a single study. This approach can involve within-method or between-method triangulation. Within-method triangulation refers to the use of several different instruments to measure a construct, for example, the use of the Peabody Picture Vocabulary Test-Revised as well as the Kaufman Assessment Battery for Children to measure different dimensions of child development. Between-method (also known as across-method) triangulation refers to the use of more than one research method to study a phenomenon, for example, the use of a qualitative approach such as phenomenology in concert with a quantitative approach such as a descriptive survey. Between-method triangulation can be accomplished simultaneously or sequentially. A second type of triangulation, theoretical triangulation, involves the analysis of data using several related yet perhaps contradictory theories or hypotheses. This type of triangulation can be used within a quantitative or a qualitative methodology; it seeks to avoid a narrow, specialized interpretation of the data. A third type, data triangulation, involves data collected from different sources. A fourth type of triangulation is investigator triangulation. The use of more than one data collector helps to ensure the reliability of the data and the use of multiple analysts to interpret the data guards against the risk of bias associated with only one point of view.

Originally, triangulation was carried out mainly for purposes of confirmation. Confirmation is analogous to convergent validity and refers to the idea that through the use of multiple methods, data sources, or investigators, a single, obvious conclusion or representation of reality can be researched. Recently, triangulation has been conducted to achieve completeness. This approach can illuminate many of the individual facets of a multidimensional construct. These researchers used qualitative and quantitative methods as they sought both confirmation and completeness in their study of families with a critically ill child. However, not all scholars agree with the notion of triangulation for completeness.

Despite these challenges, triangulation of method, data, theories, or investigators can be an important tool in developing nursing science. The concepts of interest to nursing are generally complex, multidimensional human constructs and are difficult to examine by means of a singular research approach. Triangulation is a means to a deeper understanding of these constructs.

Theresa Standing

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Uncertainty in Illness

Uncertainty in illness has been defined by Mishel (1988) as the inability to determine the meaning of illness-related events; this occurs in situations in which the decision maker is unable to assign definite value to objects and events or is unable to accurately predict outcomes because of a lack of sufficient cues. The uncertainty theory by Mishel explains how uncertainty develops in patients with an acute illness and how it is proposed that patients deal with uncertainty. Mishel further defined the original theory to refer to chronic illness in 1990, building the extended theory on chaos theory and presenting a new model.

Uncertainty regarding an illness has been identified as the greatest single psychological stressor for the patient with a life-threatening illness (Koocher, 1985). Uncertainty is not the total experience in acute and chronic illness, yet it is a constant occurrence from diagnosis through living with a long-term illness or condition. The study of uncertainty dates back to some of the early work by Davis (1960), in which he detailed the difference between clinical and functional uncertainty and tied the experience to the delivery of care and the agenda of health care providers. From 1960 through 1974, other early perspectives on uncertainty emerged, which included the work by McIntosh (1974, 1976) on the desire for information among patients with cancer. This work provided some of the first ideas about the ambiguity surrounding diagnosis and prognosis and the impact of this ambiguity on the patient's psychological state. Work by Wiener in 1975 explored the topic of uncertainty in chronic illness. This classic qualitative study on living with uncertainty brought home the invasion of uncertainty into multiple aspects of life and some strategies to tolerate the uncertainty.

Since the publication of the Uncertainty in Illness Theory and the scales to measure uncertainty: Mishel Uncertainty in Illness Scale (Mishel, 1981), the Parents Perception of Uncertainty Scale (Mishel, 1983b), the exploration of uncertainty scales for specific populations (Mishel, 1983a), along with early conceptualization of the uncertainty within illness (Mishel, 1981), the study of uncertainty has expanded considerably. Both qualitative and quantitative work in nursing and in other fields added to the knowledge on uncertainty in illness. The research has spread to practice through clinical publications (Hilton, 1992; Righter, 1995; Wurzbach, 1992). A second instrument on uncertainty in illness has been developed by Hilton (1994). This instrument is based on the stress and coping framework by Lazarus and Folkman (1984) and is not derived from a nursing theory of uncertainty in illness.

A number of reviews of the research on uncertainty in illness have been published. The first review by Mast (1995) used the uncertainty in illness theory as the framework for the review of research on uncertainty. Similarly, the two reviews by Mishel in the *Annual Review of Nursing Research* (1997, 1999) also used the Uncertainty in Illness theory published in 1988 as the framework for review, although Mishel (1999) also included the uncertainty theory published in 1990 to evaluate the qualitative work done on uncertainty in chronic illness. Stewart and Mishel (2000) reviewed the research on parent and child uncertainty. Other recent reviews of the research and theory on uncertainty include the review by Neville (2003), with a focus on application to orthopedic conditions, and the chapter by Barron (2000), on stress, uncertainty, and health. Mishel's work on uncertainty has lead to stimulating further work within nursing and related fields. Work on the concept of uncertainty has been published by McCormick (2002), Brashers (2003, 2004), and by Babrow (2001) from the field of health communication. Discussion of the theory of uncertainty as conceptualized by Mishel has appeared in two sources on nursing theory (Alligood & Tomey, 2002; Smith & Liehr, 2003, 2008).

As noted by Barron (2000) and Mishel (1997), there has been a strong interest in the study of uncertainty; however, most of it has been atheoretical. Most of the quantitative studies of uncertainty in illness have used one of Mishel's uncertainty scales, but the selection of variables had not been tied to the theory of uncertainty in illness. Most of the research has been on uncertainty in specific clinical populations, with the predominance of the quantitative research on acute illness and with more qualitative work on chronic illness. This may be due to the focus of the uncertainty scales on acute illness and hospitalization, with less use of the Growth through Uncertainty Scale, which was developed to address the chronic enduring illness conditions.

In the study of uncertainty, most of the descriptive studies are cross-sectional and the findings are associative, although the analyses in many studies are often considered predictive when causal modeling is used. At this time, some consistent findings have emerged. Across all illnesses studied to date, uncertainty decreases over time and returns upon illness recurrence or exacerbation, and uncertainty is highest or most distressing while awaiting a diagnosis. Current evidence is strong for the role of social support in reducing uncertainty among those with an acute illness. Because of the consensus of the findings, if further research is done in this area, it should be focused on building on what is known instead of repeating similar findings.

Concerning the role of personality dispositions as antecedents or modifiers of uncertainty, the evidence is not solid. In acute illness, there is some support for mastery in a mediating role, but the study of personality dispositions related to uncertainty has been limited to a small number of studies, all with cancer patients receiving treatment. Other acute illnesses require study to see which personality dispositions are associated with uncertainty and at which phase in the illness experience. Further research is necessary to determine if the acuity of illness immobilizes personality variables and whether they come into play during the recovery phase or during the management of continual uncertainty in chronic illness.

In chronic illness, interesting findings are emerging from quantitative studies of perceived personal control as a personality disposition for influencing uncertainty and the relationship between uncertainty and mood state. Likewise, spirituality is also being studied for its potential in modifying the impact of uncertainty in mood. Both of these avenues of study are important and point out that in a long-term illness, personality dimensions may come into play for their ability to reduce uncertainty or to reduce the negative impact of uncertainty.

Studies of coping with uncertainty in persons with acute illness have resulted in consistent findings for the relationship between uncertainty and emotion-focused coping. To determine if a broader range of coping strategies exists, attention needs to be given to developing instruments that are related to the problem under study. If coping strategies were derived from the setting and population, results may differ from those consistently accrued from global measures of coping.

There is sufficient evidence that uncertainty has a negative impact on quality of life and psychosocial adjustment in acute illness populations. Uncertainty has consistently been found to be related to depression, anxiety, poorer quality of life, less optimism, and negative mood states. Because the evidence is consistent and strong, it provides direction for interventions to target outcome variables. There is growing evidence in support of the effectiveness of supportive educational interventions in modifying the adverse outcomes from uncertainty. Recently, interventions for managing uncertainty in breast and prostate cancer have been published and reported strong intervention effects (Braden, Mishel, Longman, & Burns, 1998; Mishel et al., 2002, 2003, 2005, 2009). Recent publication of the intervention work in Advancing Oncology Nursing Science (2009) has presented the interventions to a broader audience. Furthermore, the recent NCI monograph (Epstein & Street, 2007) on Patient-Centered Communication in Cancer Care includes uncertainty as conceptualized by Mishel as a central issue in doctor–patient communication. The research needs to expand with the use of the theory. In other disciplines, a theory such as the uncertainty theory would be used and expanded. However, in nursing, the theory is dissected and not built on except for the work of a few. Repeated testing of these interventions, and the development of theory and research-based interventions that build on the body of existing descriptive and intervention research, should be the direction of future research.

In chronic illness, the work on management of uncertainty has been advanced by qualitative investigations in which a variety of management methods have been found across a number of chronic illnesses. The findings from qualitative studies indicate that people are very resourceful in finding approaches for living with enduring uncertainty. However, there is an absence of consistent findings. This may be because of the variation in the qualitative methods applied and how uncertainty is defined in such studies. More solid research is needed in this area, with an attempt to replicate findings across studies so that support for particular strategies can emerge.

In conclusion, the research on the concept of uncertainty continues to spread across disciplines and countries. Today, the uncertainty in illness scales have been translated into more than 15 languages and the research continues across all continents.

Merle H. Mishel

UNLICENSED ASSISTIVE PERSONNEL

Unlicensed assistive personnel (UAP), functioning in an assistive role to the registered nurse (RN), providing specific kinds of direct and indirect care pursuant to delegation of such tasks by an RN and in accordance with the respective state's Nurse Practice Act, are a safe, appropriate, and efficient use of resources to provide nursing care (ANA Position Statement, 2007). They are known by a variety of names in different care/service settings, including patient care assistant, nurse extender, nurse partner, patient care technician, or nursing assistive personnel in acute care; certified nurse assistant (CNA) in nursing homes; resident assistant in assisted living; personal care attendant or home care aide in home care; aide; orderly; and so forth. Job qualifications, training, and nursing activities vary widely. Nursing home (NH) CNAs are the subject of more intervention and descriptive studies than any other UAPs.

Most state boards of nursing indicate what nursing processes/tasks can and cannot be delegated. Tasks can be assigned if the care task is routine, low risk, unlikely to need to be modified, has a predictable outcome, and does not require assessment, interpretation, or decision making. In general, tasks cannot be delegated to UAPs if the patient is "medically fragile." Ultimate responsibility and accountability bears on the RN who needs to be aware of the education, training, and experience of the UAP and periodically assesses the UAPs performance of the specific task. A qualitative analyses of narratives (based on the Five Rights of Delegation) about a delegated task that resulted in positive and negative outcomes—revealed that nurses attributed negative outcomes to UAPs performing nursing activities that had not been delegated to them (e.g., administering a tube feeding) and their failing to receive or follow directions or established policy (Standing, Anthony, & Hertz, 2001). A nurse's experience and longevity in practice is more associated with their readiness for, and comfort with, delegation than with their being educated on how to delegate. A facility's job description for UAPs constitutes "implicit" delegation but is not always recognized as such by nurses. Explicit delegation is more concretized by nurses and constitutes more than just the patient assignment.

A growing number of states permit specially trained UAPs to administer some types of medications (generally, oral medications), in which case the UAP is certified as a "med tech" or "med aide." There is no difference in the medication error rate between assisted living community (ALC) med techs/aides and licensed nurses with regard to errors with potential moderate-to-significant harm (Center for Excellence in Assisted Living/University of North Carolina, 2009). Most errors were errors of time, that is, outside the 2-hour administration window. Medication errors of any kind were associated with poor scores on a written test of medication administration and knowledge.

The National Nursing Assistant Survey (NNAS) was first conducted in 2004 as a supplement to the National Nursing Home Survey (NNHS). Designed as a probability study, NNAS data were collected via computer-assisted telephone interview from slightly over 3,000 CNAs. The three main purposes of the NNAS were (1) to describe CNA work experience and why they chose to work in long-term care (i.e., a nursing home); (2) changes needed in wages, benefits, and career opportunities that would make the CNA job more attractive and retain current workers; and (3) to develop a framework for evidence-based research and practice initiatives that would address workforce issues. Key subject areas were recruitment, education (initial and ongoing), job history, family life, quality of management and supervision, work load and recognition for value of the CNAs work, growth opportunities within the organization, job satisfaction, workplace attitudes and environment, on-the-job injuries, and demographics. Interviewees who no longer worked at the NH were asked why they left, current work arrangements, and if they would recommend the NH to a family or friend. Data from the NNHS, NNAS, and the minimum data set will be combined to look at associations between facility and worker characteristics, perceptions, experiences, and resident care outcomes (Squillace, Remsburg, Bercovitz, Rosenoff, & Branden, 2007). Analysis of NNAS, NNHS, and Area Resource File data revealed that economic factors (i.e., wages and benefits) for low-income NH workers was significantly associated with turnover as are job security and other opportunities for employment in the geographic area (Weiner, Squillace, Anderson, & Khatusky, 2009).

Studies indicate that UAPs working in long-term care (i.e., NH, ALC, and home care) want, above all, respect and recognition from their supervisors/superiors for the work they do (Barry, Brannon, & Mor, 2005; Kemper et al., 2008; Pennington, Scott, & Magilvy, 2003). Regardless of setting, UAPs want a leadership style that is trusting and supports teamwork (Pennington et al., 2003), management practices that support empowerment and input into care decisions to effectuate quality outcomes (Barry et al., 2005; Pennington et al., 2003), and better communication (Kemper et al., 2008). Empowerment variables include nurse aides working on committees, job enhancement opportunities, extent and kind of delegation, and the degree of influence that aides have regarding resident care (Barry et al., 2005). Interestingly, there is a positive association between the influence a nurse aide brings to the development of a resident's plan of care and the level of social engagement of the resident in facility life (Barry et al., 2005).

As part of the Better Jobs Better Care demonstration project, a survey of almost 3,500 UAPs working in home care, ALCs, and NHs found that the recommendation for increased compensation was statistically significant for all three groups ($n = 1{,}091$; Kemper et al., 2008). Recommended improved work relationships were statistically significant with regard to communication, appreciation, and supervision. When NH CNAs perceive that their job affords them autonomy, the opportunity to use their knowledge, and work as a team, they are more committed to their job. This, in turn, has a positive effect on resident well-being and satisfaction (Bishop et al., 2008). The quality of the relationship between a UAP and his or her supervisor affects commitment. Having control over their work and being able to use their knowledge can, however, be mishandled and perceived by the CNA as job expansion rather than job enhancement (Bishop et al., 2008).

Empowered CNA work teams—one of the operational principles of culture change—can increase individual empowerment, improve performance (and cooperation), reduce sick calls and turnover, and improve resident care and choices (Yeatts & Cready, 2007). CNAs in an empowered team gained decision-making skills and competence, as well as having the opportunity to provide feedback to their colleagues. The influence of empowered CNA work teams on job attitude is mixed, however. Nurse managers need education about team empowerment; what it means, what it does, communication and feedback, and the nature of accountability for team decisions. Given the positive potential of culture change that includes empowerment, self-direction, and an enhanced relationship with the resident, the absence of fair wages and personal growth opportunities could mute the presumed attractiveness of a restructured job in keeping with culture change principles (Bishop et al., 2008).

Individualized care, a precursor to the concept and practice of person-centered care (PCC)—a hallmark of the culture change movement—requires organizational structures and supports to be realized. Nursing home CNA's perceptions about facilitators of individualized care include supervisor support of CNA suggestions, their interest and willingness to assist a CNA in trying a new approach to care, and their being a resource for resident care issues (Curry, Porter, Michalski, & Gruman, 2000). Being able to provide individualized care also means that the CNAs have to have the flexibility to change their assignment or schedule and to fully participate in the development of the plan of care. Barriers to individualized care are similar to factors in CNA job dissatisfaction and turnover: insufficient staff, inadequate education in clinical care, negative attitude, and poor team communication.

A researcher-developed instrument to assess the kind and amount of time CNA students spent providing PCC—the Patient-Centered Behaviors Inventory (PCBI)—found no difference between CNA students in the intervention group (i.e., received special instruction in PCC) versus those in the control group (i.e., no PCC instruction; Grosch, Medvene, & Wolcott, 2008). Using trained coders and another researcher-developed instrument—the Global Behavior Scale—intervention CNA students were slightly more likely to be in a PCC mode, but not significantly. Residents were more satisfied with their interactions with the intervention CNA students than with the control group students. The PCBI, drawing on the literature, operationalized PCC to include communication that conveyed interest in the resident's comfort, explaining the nursing task to be performed and asking permission to begin, offering choices about the care options, providing feedback to the resident about their participation in the task, engaging in social conversation, and respectfully responding to the resident's questions and concerns. The reliability and validity of the PCBI were not reported nor were the statistical significance of the findings. The guidelines to administering the PCBI, prepared by the researchers, can move forward further development and testing of this instrument.

As has been reported by others, NH CNAs are subject to pejorative name-calling by residents (Berdes & Eckert, 2001; Ramirez, Teresi, & Holmes, 2006). In some cases, the name-calling lacks specific racial references (known as "anachronistic racism"); in other cases, it is targeted and meant to be offensive (known as "malignant racism"; Berdes & Eckert. 2001). Support groups did not improve the CNA's feelings of worthlessness and demoralization. However, in-service education about confusion and dementia behavior reduced the CNA's perception of racism and improved their attitudes towards such residents.

As many as 65% of NH and ALC residents have some kind of dementia in varying stages and intensities. Interviews conducted with 154 UAPs in NHs and ALCs revealed that those with 1 to 2 years work experience had a higher stress level but more positive attitude about PCC in comparison with those who had been working longer (Zimmerman et al., 2005). Patient-centered attitude was consistently associated with dementia-sensitivity, job satisfaction, and perceived competence in providing dementia care.

Although education has been put forward as the best way to help staff, especially direct care workers like UAPs, understand, manage, and feel confident about care of persons with dementia, drawing on evidence-based practice (EBP) as the goldstone to guide practice might not be appreciated or valued by some health care workers. UAPs belonging to minority ethnic groups, with fewer years of acculturation, English-language proficiency, and lower educational achievement (high school or less) are likely to disagree with EBP recommendations. These UAPs do not want to care for demented or agitated residents and, in fact, have a sense of helplessness when trying to do their work and complete their assignments (Ayalon, Arean, Bornfeld, & Beard, 2009). Ayalon et al. (2009) examined three major beliefs about EBP with regard to Alzheimer's disease and agitation: beliefs about the use of isolation and intense supervision of residents with Alzheimer's disease, beliefs about the effectiveness of pharmacological versus nonpharmacological/behavioral interventions, and beliefs about the nature and intensity of family involvement. Significant differences between the UAPs and health care professionals (i.e., administrators, nurses, social workers, and therapeutic recreation staff) were reported. More so than health care professionals, UAPs had great faith in the use of physical or chemical restraints to control agitation and dementia behavior, felt that the family's role in managing the resident's behavior was limited, and believed that isolation and intense supervision were effective interventions. Educational interventions have to start with preparing for receptivity of EBPs and then move on to actual findings and guidelines. Nursing assistants collect data and interpret what they see for use in rating scales, the minimum data set, and in construction of the plan of care. Quality of life rating for persons with dementia by UAPs in NHs and ALCs seems to be associated with their attitudes about dementia, training, and their confidence in identifying and attending to their residents' care needs (Winzelberg, Williams, Preisser, Zimmerman, & Sloane, 2005).

An instrument developed in collaboration with CNAs was able to identify change in NH residents' behaviors such that it predicted the development of an acute illness within 7 days in comparison to residents with no observed change (Boockvar, Brodie, & Lachs, 2000). Documentation of change on the "Illness Warning Instrument" preceded licensed nurse documentation of change in the medical record by an average of 5 days. The 10-item instrument asks if the resident is the same or different "today" with regard to, for example, food intake, watching TV, confusion, or needing help with personal care.

A comparison of resident self-reported and CAN report of the presence, location, and intensity of pain revealed that more residents than CNAs reported pain (Horgas & Dunn, 2001). Severity reports of pain by residents and CNAs were similar. The CNAs were underdetecting pain in some cases and overreporting pain in other cases. Depression was clinically present among residents whose pain was not reported by CNAs. Conversely, feelings of well-being were high among residents whose CNAs reported their pain and low among residents who were experiencing unreported pain.

Professional nursing supervision of the daily care delegated to NH UAPs requires organizational systems and resources to fully operationalize the supervisory role (Siegel, Young, Mitchell, & Shannon, 2008). There appears to be a direct relationship between turnover and informal supervisory systems and processes. In spite of nurses' recognition that they have received little formal training for their supervisory role, they do not perceive a need for such training. The mediating effect (and efforts) of management are effective in crisis intervention but fail to address the larger issue of the need for a valued, prepared, and robust UAP workforce.

Ethel L. Mitty

VALIDITY

Validity refers to the accuracy of responses on self-report, norm-referenced measures of attitudes and behavior. Validity arises from classical measurement theory, which holds that any score obtained from an instrument will be a composite of the individual's true pattern and error variability. The error is made up of random and systematic components. Maximizing the instrument's reliability helps to reduce the random error associated with the scores (see *Reliability*), although the validity of the instrument helps to minimize systematic error. Reliability is necessary but not a sufficient requirement for validity.

Validity and theoretical specification are inseparable, and the conceptual clarification (see *Instrumentation*) performed in instrument development is the foundation for accurate measurement of the concept. Broadly stated, validity estimates how well the instrument measures what it purports to measure. Underlying all assessment of validity is the relationship of the data to the concept of interest. This affects the instrument's ability to differentiate between groups, predict intervention effects, and describe the characteristics of the target group.

Literature usually describes three forms of validity: content, criterion, and construct. These forms vary in their value to nursing measurement, and unlike reliability, singular procedures are not established that lead to one coefficient that gives evidence of instrument validity. Instead, validity assessment is a creative process of building evidence to support the accuracy of measurement.

Content validity determines whether the items sampled for inclusion adequately represent the domain of content addressed by the instrument. The assessment of content validity spans the development and testing phases of instrumentation and supersedes formal reliability testing. Examination of the content focuses on linking the item to the purposes or objective of the instrument, assessing the relevance of each item, and determining if the item pool adequately represents the content. This process is typically done by a panel of experts, which may include professional experts or members of the target population. Lynn (1986) has provided an excellent overview of the judgment-quantification process of having judges assert that each item and the scale itself is content-valid. The results of the process produce a content validity index, which is the most widely used single measure for supporting content validity. Content validity should not be confused with the term *face validity*, which is an unscientific way of saying the instrument looks as if it measures what it says it measures. Although content validity is often considered a minor component for instrument validation, researchers have repeatedly found that precise attention to this early step has dramatic implications for further testing.

Criterion validity is the extent to which an instrument may be used to measure an individual's present or future standing on a concept through comparison of responses to an established standard. Examination of the individual's current standing is usually expressed as concurrent criterion validity, although predictive criterion validity refers to the individual's future standing. It is important to note that rarely can another instrument be used as a criterion. A true criterion is usually a widely accepted standard of the concept of interest. Few of these exist within the areas of interest to nursing.

Construct validity has become the central type of validity assessment. It is now thought that construct validity really subsumes all other forms. In essence, construct validation is a creative process that rarely achieves completion. Instead, each piece of evidence adds to or detracts from the support of construct validity, which builds with time and use. Nunnally (1978) proposes three major aspects of construct validity: (a) specification of the domain of observables; (b) extent to which the observables tend to measure the same concept, which provides a bridge between internal consistency, reliability, and validity; and (c) evidence of theoretically proposed relationships between the measure and predicted patterns. The first aspect is similar to content validity and is essentially handled through formalized concept clarification in instrument development. The inclusion of this specification of the domain under construct validity supports the contention that construct validity is the primary form, with other types forming subsets within its boundaries.

The other two aspects of construct validity are examined formally through a series of steps. These steps form a hypothesis-testing procedure in which the hypotheses are based on the theoretical underpinnings of the instrument. Hypotheses can relate to the internal structure of the items on the instrument. Hypotheses can also refer to the instrument's anticipated relationship with other concepts, based on a theoretical formulation. The first set of hypotheses fall into the second aspect of construct validity testing; the latter relate to the third aspect.

Although there are no formalized ways to examine the hypothesis proposed for construct validity testing, some typical approaches have been identified in nursing research. Primarily, the internal structure of an instrument is tested through factor analysis and related factor analytic procedures, such as latent variable modeling. Factor analysis has become one of the major ways in which nursing researchers examine the construct validity of an instrument. It is important to note that this approach addresses only the second aspect of construct validity testing and in itself is insufficient to support the validity of an instrument. Factor analysis simply provides evidence that the underlying factor structure of the instrument is in line with the theoretically determined structure of the construct.

The third aspect of construct validation provides an opportunity for more creative approaches to testing. Hypotheses proposed have to do with the relationship of the concept being measured with other concepts that have established methods of measurement. These hypotheses deal with convergent and discriminate construct validity, subtypes that examine the relationship of the concept under study with similar and dissimilar concepts. If data shows a strong relationship with similar concepts and no relationship with dissimilar concepts, evidence is built for the construct validity of the instrument. Should data not support similarities and differences, several options are possible: (a) the instrument under construction may not be accurately measuring the concept, (b) the instruments for the other concepts may be faulty, or (c) the theory on which the testing was based upon may be inaccurate. The multitrait–multimethod matrix has been proposed as a way to formally test convergent and discriminate construct validity.

Another approach to examining the relationship among concepts involves a known group technique. In this method, the researcher hypothesizes that the instrument will provide a certain level of data from groups with known levels on the concept the instrument has been designed to measure.

The above approaches to testing construct validity are only samples of techniques that can be used. As previously mentioned, construct validity testing is creative. Researchers can design unique ways to support the validity of their instruments. The important point is that whatever is designed must be based in theory and must be intuitively and logically supported by the investigator.

Joyce A. Verran
Paula M. Meek

VIOLENCE

Violence is an intentional public health problem of epidemic proportions that impacts individuals, families, and communities. More than 1.6 million people worldwide lose their lives to violence each year (Centers for Disease Control and Prevention, 2010c). Violence is the leading cause of death for individuals between the ages of 15 and 44 years (Centers for Disease Control and Prevention, 2010c). Since the early 1980s, public health practitioners and researchers have responded to violence in an attempt to understand the roots and strategies for the prevention of violence. Violence is a preventable problem. The World Health Organization (2002) defines violence as "the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community, that either results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment, or deprivation" (p. 5). However, this definition of violence is not universally accepted as a result of cultural influences. The World Health Organization, developed a three-level violence typology of violence that includes self-directed, interpersonal, and collective violence.

Violence affects victims physically, emotionally, psychologically, spiritually, economically, and socially. Nurses are engaged in providing care to victims and perpetrators of violence in a variety of health care settings. Nursing scholarships related to violence recognize the complex interaction of community and societal factors, individual factors, and familial risk factors that include, but are not limited to, inequality, marginalization, disparity, residential mobility, poverty, unemployment, lack of education, lack of career opportunities, housing, social and cultural norms, stigmatization and bias, population density, history of violence, psychological conditions, alcohol or drug use, presence of mental illness, dependency, and attachment disorders, which require evidence and research-based preventive measures.

Violence and abuse against women (VAAW) has been recognized globally as a public health problem affecting women regardless of age, culture, or socioeconomic status. VAAW consists of physical, psychological, and sexual types; various controlling behaviors by perpetrators; stalking; and workplace violence. A silent phenomenon is violence and abuse against men, which is also considered a public health problem. Violence against men occurs through male and female perpetrators in a variety of settings. The types of violence against men are the same as that experienced by women.

Nursing research evolved from concern for the victim of abuse and focused on risk factors, battering syndrome, intimate partner violence, children of battered women, consequences of abuse, relationships of HIV infections and violence, and abuse during pregnancy. Ethical conduct and safety issues in VAAW research are critical. Campbell, Harris, and Lee (1995) published a violence review that highlighted significant findings in the area of VAAW. Manfrin-Ledet and Porche (2003) published a meta-analysis of the state of the science in the intersections of violence and HIV infection.

Contributions by nurse researchers related to the study of child abuse have focused on shaken baby syndrome, the battered child, health and sociological consequences of child abuse, risk factors, child sexual assault, and neglect. Clements and

Burgess (2002) conducted research to understand children's responses to family member homicide and associations with complicated bereavement, including childhood posttraumatic stress disorder.

Elder abuse and neglect are significantly underdiagnosed and underreported. The National Center on Elder Abuse (n.d.) defines seven different types of elder abuse: physical, sexual, and emotional abuse; financial exploitation; neglect; abandonment; and self-neglect. Elder abuse is largely hidden under a shroud of family secrecy, in addition to the problem of not being recognized by health care providers. A nursing scholarship by Fulmer and Gurland (1996) addressed elder mistreatment and elder abuse assessment. Phillips and Rempusheski (1985) studied diagnostic and intervention decisions in elder abuse and neglect.

Researchers have developed valid and reliable instruments to identify elders at risk of abuse. Instruments include screening tools for elder abuse or tools whose purpose is to assess existing cases of elder abuse for future risk. Two elder abuse screening tools are the Hwalek-Sengstock Elder Abuse Screening Test and the Indicators of Abuse Screen. Risk assessment tools for future abuse generally contain a list of indicators or conditions which are rated with regard to the elder's risk for future victimization. Typical indicators include client characteristics, environmental risk factors, support services, historical abuse factors and patterns, and abuse factors (Wolf, 2003). There is a paucity of male violence assessment instruments specific to men.

The epidemic of adolescent violence forces millions, including youth, families, and communities, to cope with injury, disability, and fatality. Homicide is a leading cause of death for adolescents. Two general trajectories have been proposed to explain the development of adolescent violence. One is the development of violence before puberty and another is violence beginning in adolescence.

Adolescent violence is preventable behavior that needs to be understood and treated. However, nursing research related to adolescent violence has been rather limited. Vessey, Duffy, O'Sullivan, and Swanson (2003) have studied teasing, a precursor to bullying, and developed the Physical Appearance Related Teasing Scale-Revised instrument to assess teasing in school-aged children. Future research should take into account risk and protective factors among the biological, psychological, and social-contextual aspects of adolescent violence.

Violence is a ubiquitous problem that affects the health of individuals, families, and communities. Historically, within nursing's evolution as an applied science service profession, nurses have recognized a professional responsibility to care for those affected by violence. Thus, nursing research focuses on primary, secondary, and tertiary intervention.

Nursing research and evidence-based practice focused on victims, survivors, and perpetrators of violence provide the necessary scientific foundation for improving quality of life, safety, and other health interventions related to violence and recovery. Developing knowledge about the myriad of human, social, structural, and environmental factors associated with violence requires theoretical and research perspectives to guide practice so that the health and well-being concerns of those individuals, families, and communities affected by violence are appropriately addressed. Within a broad ecological-theoretical perspective that addresses human, social, developmental, and environmental factors associated with violence and health, various topics have been explored throughout the history of nursing research on violence, including risk factors, battering, intimate partner violence, abuse during pregnancy, hate crime, dating violence, child maltreatment, type and severity of violent attacks, psychological and psychosocial characteristics, health consequences, coping, and many others.

For example, Campbell, Abrahams, and Martin (2008) have indicated that structural-based and gender-based violence needs to be addressed by researchers from a standpoint of intersectionality. Scholars have examined published research literature on perinatal home visitation intervention for evidence of intimate partner violence assessment and intervention, and found that no interventions were designed to address intimate partner violence within the context of home health visits to pregnant and postpartum women (Sharps, Campbell, Baty, Walker, & Merritt, 2008). Fredland, Campbell, and Han (2008) investigated relationships among young urban youth's exposure to different forms of violence (community, home, and personal), stress, coping, and health outcomes (physical, behavior, and mental). Humphreys and Lee (2009) investigated relationships among violence exposure, social support, depression, and health outcomes with three ethnically diverse community-dwelling midlife women. Amar and Gennaro (2005) conducted research to examine relationships among dating violence, mental health symptoms, health care–seeking, and physical injury. Burgess and Clements (2006) used retrospective record review of reported cases of elder sexual abuse (60 and older) to identify mental health symptoms and found that limited data was documented on posttraumatic stress disorder in 284 case records. Burgess and Clements have called for research on information processing and health outcomes associated with elder sexual abuse.

Qualitative research on experiences of hate crime, interparental homicide (uxoricide), healing from sexual violence, thriving after child abuse, and violent men who experienced childhood violence are recent advancements in violence research within nursing science. Willis (2008) utilized a phenomenological perspective to discover meanings in adult gay men's experiences of hate crime and its aftermath related to acts of physical, psychological, and verbal violence. Laughon, Steeves, Parker, Knopp, and Sawin (2008) used qualitative descriptive methods to describe the childhood remembrances of adult women who experienced their mothers being murdered by their fathers (based on interviews with the women). Draucker et al. (2009) conducted a qualitative metasynthesis to determine the essence of healing from sexual violence for adults, in which the violence was from childhood. Thomas and Hall (2008) conducted narrative research to determine how women who experienced child abuse as children are able to thrive and achieve success. Wei and Brackley (2010) used phenomenological research to understand the violence experiences of adult men in childhood and their influences on mental health and use of violence in intimate relationships.

Nursing research, practice, health policy, and political activism have all been instrumental in addressing violence as a health phenomenon. Nursing research on violence has advanced the science of violence prevention and treatment. Recommendations for future research need to focus on understanding violence in the context of cultural considerations. School-related violence must be addressed by understanding the complexity and extent of this increasing phenomenon. Also, there is a need to document the efficacy of violence prevention programs and policies through nursing research. Research data about human responses to violence should provide direction for improved health care, nursing care outcomes, and policy.

Linda Manfrin-Ledet
Danny G. Willis
Demetrius J. Porche

VIRTUAL NURSE CARING

The innovative concept of virtual nurse caring (VNC) was operationally defined and measured by Smith (2005, 2008) as communication of nurses' concern, expertise, and advocacy via the Internet in the form of accurate science-based health care information and guidance that maintains patients' and family members' sense of connection with health professionals from a distance (Smith, 2010a, 2010b). The literature on caring is diverse, with several distinct theoretical perspectives ranging from interpersonal interaction, communicating respect, and nurses providing families information needed to accurately anticipate their health care challenges (Glasgow et al., 2006; Im & Chee, 2002; Piamjariyakul, Scheifelbein, Smith, 2006; Smith, 2008; Smith et al., 2005). Watson (2003) emphasizes that nurse caring is not defined by doing but rather by creating a connection and conveying an "authentic presence" whereby families feel supported to share their experiences and health care stories. Watson (2000) states that caring can be sustained through communications from a distance using the telephone, Internet or telehealth (picture phones), and that Internet connection can encompass the essential "carative" factors of transpersonal teaching-learning and sense of presence (Finfgeld-Connett, 2006).

The concept of VNC has been tested on Web sites to ascertain patient and family members' sense of being cared for via Internet-based nursing care (Smith, 2011). The VNC questionnaire has reliable subscales that measure patients' and family caregivers' perceptions of nurse caring; detected after then use of Web sites containing nursing guidance for managing complex health care (Smith, 2010). Connections in virtual environments (Internet sites, second life platforms) can increase perceptions of nurse presence Thus, Web sites can provide VNC in the form of detailed health and treatment guides, health and illness management information, to prompts for participation in health care activities and sharing of care experiences (Smith, 2008). Web sites can contain nursing interventions that help maintain individual's quality of life and connection to health professionals (Glasgow et al., 2006; Im & Chee, 2002; Piamjariyakul, Scheifelbein, Smith, 2006; Smith, 2008; Smith et al., 2005). Web site content that is comprehensive and has evidence-based interventions can provide specific visuals and prompts for managing complex health care treatments (Fitzgerald, Yadrich, Werkowitch, & Smith, in press). Scientifically based Internet linked algorithms and illustrations can guide patients and family caregivers through step-by-step to solutions for the most common home treatment and health care problems (Smith, Puno, & Werkowitch, 2005).

Across previous studies, data themes have found that families recognize caring in nurses who communicate detailed and timely information (D'Alessandro & Dosa, 2001; White & Dorman, 2000). Other consistent themes found that patients describe a caring nurse as one who "honestly" describes the details about health care management difficulties, including the physical challenges (lack of energy and sleep disturbances), assists them with managing the depression associated with chronic illness (Smith, Leneerts, & Gajewski, 2002), and guides daily treatment complexities (Czaja & Schultz, 2006; Morris, Bottoroff, Neaderf, & Solberg, 1991). Families felt cared for when nurses had prepared them for the typical but also the uncommon occurrences, including "all the information" about the "intensity, difficulty," and the "daily work needed" from caregivers to support the patients' recovery and long-term functioning (Smith, 2009).

The societal and economic perspectives on nursing practice via the Internet are currently being studied. An HHS national study found that chronically ill persons of all ages, ethnic and economic groups, and surprisingly, those with depression consistently used and highly rated the Internet for health information (Wagner & Hibbard, 2001). There was a drastic increase in blue collar (52%), elderly (47%), and caregiver (70%) Internet use from 2004 to 2006 (Fox, 2009; PEW Internet and American Project, 2006). Daily, 6 million people log on to health sites (PEW Foundation, 2003). The few Internet interactive programs tested in inner city/rural and low socioeconomic status groups, including our studies, found patient outcomes improved (Locsin, 2005; Smith, 2007a, 2007b). Thus, the Internet can overcome problems of disparity, distance, and health care access (Fox, 2005; Glasgow et al., 2006).

There are historical examples of pioneering Internet nursing care. Such Web sites have paved the way for contemporary practice (Brennan, 1998; Brennan, Anthony, Jones, & Kahana, 1998; Brennan, Moore, & Smyth, 1992; Piamjariyakul, Schiefelbein, & Smith, 2006). Notably, Smith's Web sites provide specific information for the illness being addressed on the site (Smith, 2011; Ybarra & Bull, 2007). All content is based on the criteria of providing specific evidence that has been reviewed by health experts to ensure educative quality and clinical accuracy, and nursing interventions with everyday application shown in simple logic tested for ease of use (Smith, 2007a). Each site answers common questions provides decision-making guides and online health assessments using an interactive game format—all with immediate feedback (Brennan & Aronson, 2003; Wilson, 2007).

Web site formats should all incorporate the National Institutes of Health Web Literacy and National Disabilities Act standards, including text in large font, simple graphics, and easy-to-locate straightforward navigation symbols as well as being compatible with public library Internet connections and basic home personal computers (Yadrich & Smith, 2008). Also, these Web sites use geragogy education principles so that information is given in large font type and simple illustrations with repetition and multiple examples (Smith, 2007b). Smith's Web site has certification from the international consumer advocacy professional group, Health On the Net (2003). Health On the Net Certification includes multidisciplinary review and then continuous random monitoring for credibility of information, patient confidentiality, and the site's technical reliability (Smith et al., 2002).

Smith's Web sites incorporates "user-friendly" designs with information as easy to find as it would be in a newspaper (Brennan et al., 2001). There are common graphics, simple written instructions, defined medical terms, and automatic information links. For example, users do not have to know the medical term "hyperglycemia" to find information on high blood sugar. Training for patient/caregivers on their home computer includes the illustrated and practice session that was successfully used by the older adults in Smith's Internet trial (Dauz, Moore, Smith, Puno, & Schaag, 2004).

Content themes from evaluation of Smith's Web sites studies were that "the Internet fixed the need for detailed information on homecare," the Web site helped with "depressed moods," and "overcoming home care related family disruptions." Furthermore, it was found that the algorithms guided problem solving. Lastly, (the Web sites) "let us know we are not alone." Unlike read-only Web sites, Smith's nursing Web sites contain unique nursing interventions that engage the patient and caregiver in applying the information in their everyday management of health or illness (Gustafson et al., 2008). Thus, several studies found that following the use of nurse-developed Internet interventions, nurse caring was readily conveyed after the use of the Web sites (Smith, 2011).

New research includes one study of photographs and video recordings of surgical incisions and wounds sent from patients' mobile phones (Martinez-Ramos, Cerdan, & Lopez, 2009). Other visuals (x-ray, EKGs) are being sent directly to MD's computer screens for evaluation and reporting to patients by nurse practitioners (Cisco, 2009). Mobile phones also expand access to social support from peers. The current, third-generation easier-to-use mobile phones meet stringent privacy standards and Internet access reliability

(Glasglow et al., 2006). Other reviewers found effective chronic disease management on the Internet (Fry & Neff, 2009; Nelson, Barn, & Cain, 2003).

Overall, the Internet allows the patient and caregiver to choose when and what information to access when needed. Furthermore, results from the VNC questionnaire found nurse Web sites provided patients and caregivers with interactive anticipatory guidance, scientifically based information, and a sense of nurse caring from a distance (Smith, Kochinda, Yadrich, & Gajewski, 2010).

Notably, insurers will reimburse three times as many distant contacts versus in-home traditional visits because of the lower travel and personnel costs (National Association for Home Care and Hospice, 2009). Millions of dollars are spent annually on morbidities-associated chronic illnesses and on preventable home care complications, such as IV infections. Reducing IV infections, one of the top 25 research priorities (Institute of Medicine, 2009), can be accomplished by Internet instructions and prompts (Smith, 2005, 2007a, 2007b). However, of the 557 peer-reviewed articles on distant nursing (none on cell phones or the Internet), only 55 included costs and only 24 of those used standardized cost measurement as used in this study (Whitten et al., 2002). There is a need to determine the cost-efficiency and clinical effectiveness of mobile phone versus Internet nursing interventions guides (Smith, 2007a, 2007b).

Future directions of research are to test new technologies to convey VNC. Specifically, research must test if mobile telephones can access the Internet, illustrate health care treatment, answer common illness questions, and provide decision-making guides and automated symptom or health assessments. Also, research on the impact of VNC on clinical outcomes and privacy in relation to using the Internet should be undertaken (Dilworth-Anderson et al., 2005; Im & Chee, 2002).

Carol E. Smith

VULNERABLE POPULATIONS

More than 717,000 unduplicated articles spanning the years 1982 through 2010 were identified via www.scholar.google.com using the key terms "vulnerable" and "populations." The most frequently cited authors were Gelberg, Anderson, and Leake (2000; n = 250) and Aday (2001; n = 302). A surfeit of research has examined vulnerable populations (VPs) over this past decade (2000–2010). A search through Elton B. Stephens' Company (EBSCOhost) for electronic journals using the same parameters generated 4,922 articles. An advanced search through EBCSO set for "research" and "nursing" resulted in 345 studies. The focus of these studies were veterans, cultural approaches, social justice using human subjects, global populations and disasters, and the reduction of health disparities. A search through the Cumulative Index to Nursing and Allied Health Literature database using the search selection terms "vulnerable," "populations," and "research" between the years 2000 and 2010 resulted in 266 studies. The focus of these articles were gang youth, prisoners, international populations and settings, the effectiveness of nursing interventions, system-related delivery of care structures and values on impact of care (i.e., ER use and primary care vs. faith-based nursing settings and school-based clinics), the development of theory and science, measurement issues and instrument development, and policy. In essence, earlier research focuses on identifying populations most at-risk and later research focuses on methods for improvement in research and outcomes.

VPs in reference to human beings are those identified as being at-risk for health problems, harm, or neglect (Aday, 2001; Leight, 2003). Most often, these humans are referred to as "the poor and those with chronic illnesses" or people who are less fortunate than others due to low socioeconomic variables (Lexchin & Grootendorst, 2004). The term is derived from a combination of Latin words: *vulnerare* (verb) meaning "wound" and *populatio* meaning "wasting or devastation" as well as *populous* meaning "specific members of a region." Aday (2001) referred to VPs as societal subgroups in the position of being hurt, ignored, and/or helped by others. She claimed all members of human communities are potentially vulnerable. Flaskeraud and Nyamanthi (2002) contend that VPs have increased susceptibility to health adversities due to discrimination and marginalization. A summary of those most at-risk include, but are not limited to, women, pregnant women, infants, children, teenagers and young adults, the economically or educationally disadvantaged, ethnic people of color, immigrants, prisoners, international groups living in poverty conditions, people living in disaster and war-torn areas, homosexuals, HIV infected, chemically addicted, mentally impaired, homeless, elderly, and those living in rural and urban settings (Flaskerud & Nyamanthi, 2002; Flaskerud et al., 2002; Leight, 2003). When coupled into subgroups, the appellation is "doubly" VPs (Liamputtong, 2007; Moore & Miller, 1999). The impact on health of being doubly vulnerable is not well defined, but legal and ethical implications for research and intervention are presented (Fleischman & Wood, 2002). This has been most evident in studies pertaining to the effect of disasters on victims (Gershon, Rubin, Qureshi, Canton, & Matzner, 2008). An international legal definition of VPs is found in the Safeguarding Vulnerable Populations' Act of 2006 (Griffith & Tengnah, 2009; Schwehr, 2010). An interpretation of the United States' legal definition relates to susceptible individuals within specific subgroups and has not changed since 2003 (Stone, Horton, Pestronk, & Ransom, 2003).

Early in this decade, national attention has focused on VPs, as evidenced by National Institutes of Health and National Institute of Nursing Research's missions and funding opportunities as well as *Healthy People 2010*'s goals (Shi & Stevens, 2005; National Institutes of Health, 2000; National Institute of Nursing Research, 2000; U.S. Department of Health and Human Services, 2000). The national attention was in direct response to the World Health Organization's *Health for All* and *Millennium Development Goals*. The American Nurses' Association defended the relevance of VPs for nursing research. The notion of equality and health presents an overlap in defining "health disparities" (among various populations) and "vulnerable populations" as applied to elimination of health disparities using social determinants of health (Guthrie, 2005; U.S. Department of Health and Human Services, 2000). As a result, the Institute of Medicine (2002) report reframed national focus that VPs experience health disparities especially in the unequal receipt of health care, specifically, in the quality and access of services (Nyamathi, Koniak-Griffin, & Greengold, 2005). The signing of the National Health Care Reform Bill in 2010 has changed the face of health care receipt. The principles of social and distributive justice, as it relates to resource allocation, are of debate. For example, Frolich and Potvin (2008) proposed an inequality paradox for decreasing health inequities between socially defined groups. They explained an inverse care law: those with the most resources at hand during crisis adapt more readily and are first to derive maximum benefit from interventions. The end result may lead to positive discrimination, stigmatization, and inefficient public health. The debate has not been entertained by leading agencies. In fact, *Healthy People 2020's* national goals have not been released to date. The focus of the National Institutes of Health is on genomics as related to health differences among various populations (Collins, 2010). National Institute of Nursing Research and American Nurses Association remain focused on the art and science of nursing as it relates to positively influencing the health of VPs.

Theoretical perspectives of VPs are rooted in the fundamental tenet of defining and describing VPs as related to health risk and time across life course (Aday, 2001). That is, risk to health is directly related to the amount of time a person or group is exposed to health threats as well as the length of time it takes for disease to develop. The VPs conceptual model (VPCM) for health and research developed by Flaskerud and Winslow (1998) postulates interrelationships between resource availability, relative risk, and health status mediated by access to care (Aday & Andersen, 1974). The University of California, Los Angeles School of Nursing, Center for Vulnerable Populations Research faculty are experts in the area and have explored the health behaviors of many subgroups in terms of health behavior outcomes using the VPCM as a guide in answering research questions. Another model that has been used to guide research is the Comprehensive Health-Seeking and Coping Paradigm, which explores environment, behavior, social demographics, and health outcomes (Nyamathi, 1989). The focus of the Comprehensive Health-Seeking and Coping Paradigm is more on the individual than in the population; yet, the model has a research-practice paradigm (Nyamathi et al., 2005). Receipt of care has been explored using the Behavior Model for Vulnerable Populations (Gelberg et al., 2000). The model served to determine predictors of health service utilization and behavior change (Nyamathi et al., 2005).

Each concept of the VPCM uses empirical indicators to predict health status. This model has been fundamental to designing descriptive studies to enhance understanding and knowledge about VPs. The University of California, Los Angeles, School of Nursing, Center for Vulnerable Populations Research's contributions to scientific literature have been extremely productive in terms of developing collaborative partnerships, multisites for data collection, and timely publications. The current issues in developing the nursing science of nursing specific to working with VPs are two-fold: ethics and measurement.

Since the 1970s the organizational-based human ethics and research committees have been required to provide ethical approval for research. With regard to ethics in researching VPs, study design, setting, and situation are key factors (Perez & Treadwell, 2009). When multicentered designs are used, it is imperative that review boards consider the local impact of the study on VPs (McCauley-Elmson et al., 2009). Palliative care patients are considered vulnerable. Ethical considerations involve benefit and risk of interrupting natural death experiences, pain, and offering false hope to a defined end. Mental health patients are considered VPs. Ethical considerations involve risk of further psychological distress, exacerbation of illness, risk of exploitation, and/or coercion. General considerations are more comprehensive than attaining written approval, but in spending extra time with patients to protect vulnerability (McCauley-Elmson et al., 2009). Prisons and schools require strict adherence to federal guidelines for including prisoners and school children in research (IOM, 2004, 2006; Lerner, 2007). Community-based participatory research offers a conduit for considering VPs' perspectives (McCauley-Elmson et al., 2009) and can allow for participants to a voice and representation, thus promoting equality. UyBico, Pavel, and Gross (2007) emphasized that regardless of study design, recruitment of VPs need ethical review because financial reward can represent coercion and payment can invoke bias (Bentley & Thacker, 2004; Emanuel, 2004; Halpern, Karlawish, Casarett, Berlin, & Asch, 2004).

Determining bias and valid results in relation to VPs was the charge of Strickland, DiLorio, Coverson, and Nelson (2005). They completed a research review on studies (n = 133) published in selected nursing journals (n = 4) in 2004. About 62% of studies involved VPs. When quantitative designs were used, survey research focused on nursing care (38%) and most often validity and reliability were lacking because most instruments were developed and tested on nonvulnerable samples. In essence, poor measurement practice has been common among research involving VPs. There is a new focus to make sure certain measurement concerns are addressed (Strickland et al., 2005).

Ann M. Stalter

W–Z

WANDERING

Since 1980, when Irene Burnside expressed dismay at the lack of a suitable definition of wandering as well as the lack of nursing articles or research on the topic, thousands of journal articles have addressed the topic. Although numerous definitions have been proposed since 1980, the common threads are (1) locomotion and (2) cognitive impairment. One of the more comprehensive modern definitions was proposed by the International Consortium for Research on Wandering. It defines wandering as "a syndrome of dementia related locomotion behavior having a frequent, repetitive, temporally disordered, and/or spatially disoriented nature that is manifested in lapping, random, and/or pacing patterns, some of which are associated with eloping, eloping attempts, or getting lost unless accompanied" (Algase, Moore, Vandeweerd, & Gavin-Dreschnack, 2007, p, 696).

The prolific work of Dr. Donna Algase has illuminated the complexity of wandering behavior. Since the early 1990s, numerous nursing studies have used observational techniques to document characteristics of wanderers as well as the frequency, duration, and patterns of wandering. Studies of personal characteristics of wanderers have produced variable results. Algase's (1999b) review reported no consistent relationships between wandering and gender, education, or race. Factors that correlated positively with wandering included general health, appetite, fewer medications and medical diagnoses, and other "agitated" behaviors. Factors that correlated negatively with wandering were pain and eating impairment.

The etiology of wandering remains a topic of debate. Proposed explanations range from physical discomfort, boredom, seeking a familiar place or person, and unmet needs to right parietal lobe dysfunction. Positive correlations have been found between wandering and cognitive impairment, spatial disorientation, stress, unmet needs, reduced higher order cognitive and planning abilities, and circadian rhythm disturbances. The possibility that wandering is an extension of a person's premorbid activity level or means of reducing stress has been examined with inconsistent results. One study in long-term care facilities identified low extroversion scores and negative verbalization in response to stress as two premorbid factors that predicted greater wandering behavior (Song & Algase, 2008). The need-driven behavior model has been used to explain wandering as the result of the interplay of background (relatively fixed variable such as general health status and neurocognitive status) and proximal factors (dynamic individual or environmental variables such as physiological needs) (Algase, 1999a). Aspects of the physical environment that have been examined include lighting, noise level, home-like arrangements, and furnishings.

Wandering can be viewed as meaningless or as an effort to fulfill felt needs that the patient may or may not be able to communicate. Cohen-Mansfield and Werner (1998) asserted that wandering could be both adaptive and appropriate for the cognitively impaired elder. Despite general agreement that activity has physical benefits, wandering is treated as a problem because of the risk for harm from falls or becoming lost in dangerous places. Therefore, most intervention studies focus on structuring the physical or psychosocial environment to prevent unsafe wandering. Areas of study have included environmental modifications, exercise programs, and medication reviews. The use of physical restraints is universally labeled an unacceptable strategy because of the potential for harm by the restraints and the ethical issues raised by their use. Environmental strategies have included the creation of safe walking areas that offer sensory stimulation, the use of visual illusions to discourage walking beyond certain limits, concealment of exits, doorknobs, and so forth, and the use of alarms and tracking devices. Assuming that wandering might represent a need for more physical activity, some investigators have implemented regular exercise programs. Despite the array of studies, it remains difficult to generalize findings because of the variations in definitions, measurement instruments, and samples studied.

The limited intervention studies located focused on environmental adaptations, caregiver approaches, and pharmacologic management. In relation to environmental conditions, wandering was found to increase in the presence of a low noise level and with normal lighting and temperature (Cohen-Mansfield & Werner, 1995; Cohen-Mansfield, Werner, Marx, & Freedman, 1991). Limited research on visual illusions shows that they work with some, but not all, patients (Price, Hermans, & Grimley, 2001). Differences in patient responses to specific adaptations could be attributed to differences in cognitive skills that characterize each stage of dementia among study subjects.

Increased tolerance of wandering, measures to create safer wandering environments, and caregiver education have made drug therapy a last resort in most cases. When wandering is accompanied by agitation, neuroleptics sometimes are used. A major adverse effect with neuroleptics is orthostatic hypotension. The atypical antipsychotics such as risperidone and olanzapine are preferred for older adults because they have fewer side effects than most older neuroleptics (American Geriatric Society Clinical Practice Committee, 2003). One comparative study found slightly fewer side effects with risperidone than with olanzapine in a sample of 730 adults with dementia (Martin, Slyk, Deymann, & Cornacchione, 2003). Cholinesterase inhibitors are reported to improve function for some persons with Alzheimer's disease, especially in the early stage, and may also reduce behavioral disturbances (Daly, Falk, & Brown, 2001).

In summary, research on wandering continues to elucidate variables and characteristics associated with wandering. Common acceptance of a single definition of wandering is needed to allow evidence of best practices to accumulate. Emphasis on interventions to maintain safety without undue restrictions is receiving increased attention. Continued efforts to identify and meet underlying needs are warranted. Other suggested topics for future studies might focus on (a) assessment and management in various settings including acute care, transitional settings, assisted living, and private residences, and (b) strategies for locating lost wanderers.

Adrianne D. Linton

WATSON'S THEORY OF HUMAN CARING

Watson's Theory of Human Caring has its origins in 1975 through 1979 (Watson, 1979) as an "attempt to bring meaning and focus to nursing as an emerging discipline and distinct health profession with its own unique values, knowledge, and practices, with its own ethic and mission to society" (Watson, 2001, p. 344). Watson (1996, p. 142) proposed that her early work could be viewed as a "philosophy, ethic, or even a paradigm or worldview" that embraces the art and science of nursing. Watson proposed an integrated view of personhood, life, health and healing (p. 141) with an emphasis on the spiritual nature of the human being and the transpersonal caring relationship that is the basis of nursing practice.

Watson embraces caring science as necessary for the survival of nursing and humanity. Caring science is described as "a deep moral-ethical context of infinite cosmic love" (Watson & Woodward, 2010, p. 353). Further, Watson believes that caring science allows nursing's caring–healing core to be both discipline specific and transdisciplinary (Watson & Woodward, 2010). Specifically, Watson (2005a, 2008b) has introduced the term *caritas* to further explicate the relationship between caring and love in the context of human caring philosophy and theory. The definition of caritas used by Watson is from the Latin and means "to cherish and appreciate, giving special attention to, or loving" (Watson & Woodward, 2010, p. 353). Thus, this represents an evolution in language from the concept of *carative* (Watson, 1979) to the use of *caritas* for the theory of transpersonal caring, the use of *clinical caritas process* rather than carative factor, and the transpersonal *caritas* energy field for the context of the heart-centered transpersonal caring moment.

The Theory of Human Caring embraces the values of the reverence and sacredness of life and humanity. Through the art and the science of human caring, humanistic care in which both the nurse and the individual receiving the care are affected, resulting in a more humanistic, holistic self-transcendence (Watson, 1996). The original carative factors that "actually potentiate therapeutic healing processes for both the one caring and the one being cared for" (Watson, 1996, pp. 154–155) are now emerging as the clinical caritas processes. Through the transpersonal caring relationship, one seeks to embrace the soul (spirit) of the other (Watson, 2002; Watson & Woodward, 2010). Transpersonal caring creates a heart-centered transpersonal caring moment within the Caritas energetic field (Watson, 2008b), in which the nurse is centered on consciousness, intentionality, and presence for the purpose of transformational caring. The transpersonal caring relationship provides unitary caring approach to transformational caring–healing that recognizes the spiritual nature and dignity of humanity.

Watson's Theory of Human Caring provides a philosophical and theoretical foundation for nursing science, practice, and education. Human caring is in fact a worldview that encompasses a way of being awake to oneself and others, being intentional in one's life and work, being genuinely present for self and other, and embracing the caring–healing transformational process. Watson's theory has been widely disseminated globally in scholarly works, served as a guide for master's and doctoral student research, provided a foundation for theory-based practice and curriculum development, and has framed the development of research in human caring and methods. At the Watson Caring Science Institute, work is being engaged in and disseminated to address resources and research models for nursing education, clinical practice, and administration. The theory of human caring has made a significant on nursing science and caring science. The work continues as clinicians, theorists, researchers, and educators engage in diverse ways of knowing to generate greater understanding of the unitary, human caring–healing experience.

Diana Lynn Morris
Updated by Kristen S. Montgomery (1998)
Updated by Diana Lynn Morris (2010)

WEIGHT MANAGEMENT

Weight management, defined as deliberate actions to reduce and maintain healthy body weight, is classified as formal and informal. Formal weight management consists of paying for organized services to assist individuals with weight reduction, such as health center-based and commercial programs. Informal weight management includes personal weight-loss methods without professional assistance. Weight management usually is targeted at reducing weight (versus gaining) because of societal pressures to be thin and growing epidemic incidences of overweight, obesity, and comorbidities. For adults 20 years or older, overweight is defined as having a body mass index (BMI) of 25 to 29.9 kg/m^2 and Class 1 obesity is defined as having a BMI of 30 to 34.9 kg/m^2 (National Heart, Lung, and Blood Institute [NHLBI], 1998). Class 2 obesity is defined as having a BMI of 35 to 39.9 kg/m^2, and Class 3 is having a BMI of greater than 40 kg/m^2 (World Health Organization Expert Committee on Physical Status, 1995).

Overweight and obesity are a grave health care epidemic despite efforts and national initiatives to abate this growing dilemma. Progress in the past 10 years toward Healthy People 2010 objectives for overweight and obesity was of little consequence, thus requiring retention and revision for the new Healthy People 2020 objectives for healthy weight and obesity (Sondik, Haung, Klein, & Satcher, 2010). According to the National Health and Nutrition Examination Survey (NHANES) U.S. data from 2007 to 2008, overall prevalence of overweight and obesity for adults was 68% (approximately 72% among men and 64% among women; Flegal, Carroll, Ogden, & Curtin, 2010). Overall, obesity prevalence was 35.5% for women and 32.2% for men. Class 3 obesity was reported to have increased at greater rates than any other class of obesity in the United States (Blackburn, Wollner, & Haymsfield, 2010).

Over the past three decades, childhood obesity has more than doubled among children ages 2 to 5 years, has tripled among youth ages 6 to 11 years, and has more than tripled among adolescents ages 12 to 19 years (Flegal et al., 2010). Approximately 17% of American children ages 2 to 19 years were obese—a 1 in 6 incidence. Overweight and obesity have a greater effect on minorities; Blacks had 51% and Hispanics had 21% higher obesity prevalence compared with Whites. National study of costs attributed to overweight and obesity revealed that medical expenses accounted for over 9% of total U.S. medical expenditures in 1998 or approximately $78.5 billion (Finkelstein, Fiebelkorn, & Wang, 2003). In 2002, expenses rose to $92.6 billion, half of which were paid by Medicaid and Medicare.

Overweight and obesity are multifactorial conditions. Etiological influences include bio-psycho-sociocultural factors and toxic, obesogenic environmental factors (Apovian, 2010; Blackburn et al., 2010). Experts agree that obesogenic environmental factors, more than biological reasons, explain the obesity epidemic over the past four decades. Four conditions account for the environmental stimulus–response nature of the rise in obesity in the United States: (1) a fast-paced eating style consisting of fatty, glycemic "fast foods" and super sizing; (2) excessive calorie intake; (3) reduced physical activity and technological dependency; and (4) heightened responsiveness to food as a stimulant (Hill, Wyatt, Reed, & Peters, 2003).

Unfortunately, failure rates for weight loss treatments in the United States, once estimated to be as high as 90% to 95%, have not improved. Long-term habits of overeating without hunger and with minimal regular physical exercise in a fast-paced society have been described as chronic and refractory with high recidivism for treatment (Wadden, Brownell, & Foster, 2002). Most weight-loss treatments in the United States have not helped reduce weight over the long term and have even contributed to the overweight problem (Hill & Wyatt, 2005). As obesity increased, so did many associated comorbid conditions, including hypertension, dyslipidemia, type 2 diabetes, coronary heart disease, stroke, gallbladder disease, osteoarthritis, sleep apnea and respiratory problems, and endometrial, breast, prostate, and colon cancers. Insulin resistance syndrome (metabolic syndrome) is positively correlated with excess weight and lack of physical activity and affects approximately 24% of American adults (Ford, Giles, & Dietz, 2002; National Institute of Diabetes and Digestive and Kidney Diseases, 2010). The safest, most effective way to reverse insulin resistance and most obesity comorbidities is through physical activity, dietary intake (less glycemic, more fiber), and weight loss (National Institute of Diabetes and Digestive and Kidney Diseases, 2010).

The challenge that continues to face America is not so much achievement of weight loss but rather weight loss *maintenance*. The most known unidimensional physical strategies for losing weight have been successful, including reduced dietary volume, calories, fat, and carbohydrates and increased energy expenditure through physical exercise. Medicines to reduce fat metabolism (orlistat) and suppress appetite (sibutramine, phentermine, and herbal preparations) have been found to be effective, especially combined with lifestyle modifications (American Dietetic Association [ADA], 2009). Bariatric surgical treatments for obese individuals that reduce intake volume (vertical banded gastroplasty) and reduce food absorption (gastric bypass) have been found to successfully reduce comorbidities (Buchwald et al., 2004). These unidimensional strategies are consistently based on energy balance theory, as it stresses the physiological balance between energy in and energy out needed for weight loss, maintenance, and gain (Hill & Wyatt, 2005; NHLBI, 2010).

Few weight management programs use a holistic, multidimensional approach to lifestyle changes with strategies that address and correct underlying overeating, lack of exercise, and poor self-esteem (Popkess-Vawter, Yoder, & Gajewski, 2005). Often, weight management strategies used in clinical trials research place greater emphasis on eating, exercise, or psychosocial aspects rather than *holistic* emphasis on *all three* dimensions. Treatments that do not permit individuals to tailor weight management to their preferences and lifestyles cannot be lasting. Weight loss treatments fail when program directives are too stringent for individuals to feel ownership and acceptance of weight management strategies as a way of life (Hill et al., 2003).

The 2009 ADA position statement defined multidimensionality for long-term weight management. Comprehensive programs should make maximum use of multiple cognitive–behavioral strategies (self-monitoring, stress management, stimulus control, problem solving, contingency management, cognitive restructuring, and social support) in addition to dietary and physical activity strategies to lose and maintain weight loss. Successful weight management programs, therefore, are multidimensional, flexible, and also focus on internal motivations for overeating and not exercising regularly.

Behavioral strategies have gained recognition as being important to promote long-term weight management, such as the PREMIER, Diabetes Prevention Program, Finnish Diabetes Prevention, and Look AHEAD studies (ADA, 2009). Confusion, however, exists in recognizing differences between behavioral strategies and cognitive–behavioral strategies. Behavioral strategies use behavior modification, which focuses on changing individuals' behaviors with little or no concern for their underlying reasons for overeating, not exercising, and unhealthy coping behaviors (Popkess-Vawter, 2008). Behavioral weight management strategies emphasize stimulus control of intake and output by dieting and weight-related behavior modification, which are unidimensional and focus mainly on calorie reduction. A stimulus response mentality (emphasis on overweight behaviors) without regard for individuals' beliefs, thinking, feelings, and related behaviors (cognitive–behavioral theory) may be partly responsible for continued escalation of the overweight–obese epidemic. Dietary, pharmacological, and surgical treatments that reduce intake and restrict calories, choices, and when to eat offer temporary modifications that are unrealistic for the long term and often are accompanied by rebound weight gain and detrimental psychological consequences (Popkess-Vawter et al., 2005).

Strategies that concentrate on modifying behavior by differentiating stimuli before, during, and after eating are a healthy *start* toward lasting weight management (i.e., identifying stimuli other than hunger that trigger eating, monitoring amounts and conditions during eating, and rewarding appropriate actions). One reason why behavioral techniques have limited success is because they seek to control the diet and environment without considering eating as a coping mechanism to manage unpleasant feelings (Popkess-Vawter, Brandau, & Straub, 1998). Few current weight management behavioral approaches, cognitive restructuring, or combinations thereof directly address how negative beliefs about self and irrational perceptions of the world can trigger negative self-talk with resultant responses of overeating, skipping regular exercise, and feeling bad about self (Popkess-Vawter, 2008). Increasing numbers of researchers have reported findings from weight management studies based on psychosocial theories such as self-efficacy, transtheoretical model, self-determination theory, and health belief model, which suggest progress in using holistic strategies for eating, exercise, and psychosocial aspects.

Stringent recommendations of the past have only fueled the obesity epidemic (Hill et al., 2003). NHLBI weight management programs like "America on the Move" and the 2005 Dietary Guidelines for Americans are national initiatives that have accommodated people's busy lives by suggesting "real world, do-able" eating and exercise goals for reversing the obesity epidemic. Consistent research findings have shown that 60 to 90 minutes per day of moderate intensity physical activity is needed to maintain a significant weight loss (Hill & Wyatt, 2005). Despite these promising findings, most people, normal weight or overweight, will find exercising 60 to 90 minutes daily difficult and unrealistic over the long term. Jakicic, Winters, Lang, and Wing (1999) found that 10-minute exercise bouts done three to six times daily can be effective for weight management and more practical for busy people's lifestyles. Small targeted behavioral changes (e.g., walking 15–20 minutes daily) can significantly contribute toward sustained weight loss. There is growing evidence that 5% to 7% of maximum weight lost is associated with lower incidence of diabetes, reduced blood pressure, and improved dyslipidemia (Yanovski & Yanovski, 2002). Modest weight loss and improved fitness can lower comorbidity risk and ultimately lead to sustained weight management (Blackburn et al., 2010).

Convenient and practical means to offer multidimensional weight management approaches include use of telehealth videoconferencing, telephone, and the Internet, which in turn offer greater access for study participants and future applications for formal programs (Enwald & Huotari, 2010; Kim et al., 2010). Research is needed to develop and test community-structured and work-related multidimensional programs (Apovian, 2010; Greener, Douglas, & vanTeijlingen, 2010). Collaboration among researchers, health professionals, policy makers, and community leaders is essential for tailoring meaningful research (Flegal et al., 2010).

The ultimate goal of weight management is to prevent obesity and its comorbidities (Serdula, Khan, & Dietz, 2003). Research agendas must include the refractory nature and high recidivism to assure long-term weight management. Primary care clinics are frontline settings to approach people about weight management, but structured and practical treatments are still lacking. Providers may not be aware of their powerful influence in helping patients with weight management (Clark et al., 2010; Heintze et al., 2010). Health professionals and patients need to be educated about the benefits of modest weight loss using evidence-based methods (Phelan, Nallari, Darroch, & Wing, 2009). To promote healthy weight among Americans, long-term, lifestyle-change intervention studies are vital, using qualitative and quantitative measurements of physical and psychosocial weight management strategies.

Sue A. Popkess-Vawter

WELLNESS

The definition of wellness dates back to the time of Hippocrates and the definition continues to be revised. Early definitions were focused on wellness as freedom from disease processes. Current understandings of wellness are influenced by changes in society.

From a nursing perspective, wellness can be viewed as a progression to better health, including encouraging activities that promote health. You have to feed the body correct nutrition, to exercise to improve the body, and to spiritually connect to the body to engage in the outcome of wellness. Nurses have always had an impact on influencing patients to make lifestyle changes that can improve wellness.

Dunn in the late 1950s was one of the first to use the term wellness. Wellness was described by Dunn as a complex state that is a combination of different levels of wellness (Dunn, 1959). In the 1970s emerged others like Ardell, Hettler, and Travis who was also interested in wellness. In the 1980s, Smith, Laffrey, Walker, Sechrist, and Pender were all instrumental in the wellness movement.

Hettler cofounded the National Wellness Institute in 1975. In 1976, Hettler developed the 6 Dimensional Model of Wellness (Hettler, n.d.). This model also became known as the hexagonal model (Hettler, n.d.).

Ardell (2010) has developed numerous wellness models since the 1970s. The REAL wellness model was developed by Ardell in 2010; REAL stands for reason, exuberance, athleticism, and liberty (p. 3). Ardell produces a weekly wellness report and is active in helping people to age without becoming old prematurely (Ardell, n.d.).

The topic of wellness has been discussed for the past 50 years with great strides being made. There is a great need for further research as our health industry is changing. Wellness has become an important focus and the illness challenge has changed to staying healthy.

The Internet has opened up the arena to research, to evaluate, and to understand the topic of wellness. Travis who was a pioneer of wellness has his own websites that are devoted to wellness as well as many others. Today Travis states that you have view the consciousness of the world if you address wellness (Travis, n.d.). How a person views the world determines their experience with wellness (Travis, n.d.).

The Medical Home Model is the start of the new wellness revolution. There will be a need for studies in the future to see if the Medical Home Model works. This is a new arena that will demand research to validate and find new areas that will improve health and wellness.

Joyce Johnston

WIDOWS AND WIDOWERS

Between 2003 and 2010, nurse researchers expanded knowledge about widows and widowers, especially particular subgroups. However, the main focus remained on bereavement rather than longer term circumstances of widowhood. Of the 30 full-length reports retrieved from CINAHL and PubMed, only 1 was an intervention study. Qualitative methods were used in 27 of 29 descriptive studies. The work clustered around four themes: (a) retrospective reflections on bereavement, (b) pre- and post-bereavement experiences, (c) concepts and variables pertinent to widowhood, and (d) health-related experiences of older widows.

Of the eight qualitative cross-sectional studies including diverse subgroups of widows and widowers, the only one involving widowed persons of both genders was done in Korea, with five women and five men whose spouses had died from cancer. There were gender differences in grief responses and influences on grieving (Lee, Lee, Kim, & Kang, 2005). In the only study pertaining only to widowers, Rushton (2007) interviewed 14 middle-aged and older men and some of their adult children 2 to 15 years after the death of the spouse/mother. Family communication problems associated with the loss were paramount pre- and post-bereavement.

Bent and Magilvy (2006) described experiences of six widowed lesbians, noting political, social, and familial matters that positively and negatively affected participants' experiences and called for nursing interventions to preclude "complicated bereavement" (p. 456). Stigmatization and isolation also were features of life for 10 barren, older rural widows in Nigeria (Fajemilehin, 2003). Harrison, Khan, and Hsu (2005) and Rodgers (2004) explored bereavement experiences with samples of 11 middle-aged and older African American widows. Rodgers incorporated observations of nonverbal behaviors and gestures of participants and recommended that nurses allow African American widows opportunities to tell their stories of bereavement. Otherwise, the findings of the two studies were similar with regard to the importance of (a) being with the dying spouse, (b) feeling minimal guilt about events associated with the death, (c) drawing support from various sources, and (d) retaining bonds with the spouse while learning to let go.

Several authors explored bereavement experiences with subgroups of younger widows. As detailed in a grounded theory study, 24 Iranian widows with children sought to continue bonds with their husbands even as they experienced overwhelming hopelessness and marked lifestyle changes (Khosravan, Salehi, Ahmadi, Sharif, & Zamani, 2010). Doherty and Scannell-Desch (2008) did a phenomenological study of widowhood during pregnancy with 10 women whose husbands had died in the 2001 terrorist attacks or while serving in the Armed Forces in Iraq or Afghanistan. As in findings of the study with lesbian widows (Bent & Magilvy, 2006), positive and negative facets of support were presented. "Navigating pregnancy: flying solo while running on empty" and "re-creating home: a new normal" were two of the emergent themes.

Steeves and Kahn (2005) used a longitudinal design and recruited widowed persons of both genders. Using a hermeneutic approach, they interviewed 10 older women and 5 older men before and after the spouse's death and compared findings by gender. Their interpretation highlighted metaphors associated with grieving, grief work, home-related concerns, and getting on with one's life. Although all participants were rural, implications of rurality relative to findings were not addressed.

In two descriptive phenomenological studies from the same project with 10 midlife widows, Scannell-Desch (2005a, 2005b) isolated two sets of concepts for study, contrasting struggles with triumphs and comparing "experiences of support and nonsupport" (p. 43). Similarly, Shih, Turale, Shih, and Tsai (2010) considered the influence of religiosity on the bereavement adjustments of 20 older Taiwanese widows in a mixed-methods study, classifying participants' religious beliefs as extrinsic or intrinsic and comparing problems and coping strategies of the two groups. In the only intervention study retrieved for review, Korean middle-aged women who took part in a bereavement program (including the meditative practice of Dan-jeon) had lower grief levels and fewer stress symptoms than the control group (Kang & Yoo, 2007). Kowalski and Bondmass (2008) surveyed 173 women (aged 30–91years) who had been widowed less than 5 years. They found “moderate … correlations” (p. 27) between the number of self-reported physiological grief symptoms and scores on the Revised Grief Experience Inventory. However, values for r were reported rather than values for r^2, so correlations actually were modest. Compared with women who had been widowed less than a year, women in the second year of widowhood reported fewer physical symptoms of grief.

The first anniversary of the spouse’s death has long been viewed as a stressful time. Correlations among psychological stress, physiological stress, well-being, optimism, and life satisfaction were explored 12 and 13 months after bereavement with 47 widows 65 years or older (Minton, Hertzog, Barron, French, & Reiter-Palmon, 2009). At both data points, patterns in rates of physiological and psychological stress varied without clear evidence of an anniversary reaction. Minton et al. (2009) noted that stress might have peaked prior to the anniversary but that supposition could not be verified. The positive correlation between measures of optimism and life satisfaction was consistent with prior gerontological research.

Drawing on interviews with 16 widows about the experience of living alone at home, Porter (2005c) described sources of satisfaction in daily life and the phenomenon called *savoring satisfactions*. The essence of the component phenomenon, *bowing to no one*, was similar to autonomy, a common concept in gerontology. Other component phenomena, such as *marking the milestones*, were new to the literature. Sources of satisfaction varied, suggesting that nurses should explore such sources in individualized assessment with clients.

Porter studied the experience of home care related to widows, engaging in interviews over 3 years with 25 widows (aged 81–96 years). In contrast to the typical formal–informal dichotomy of home-care helpers, four categories of standby helpers emerged (Porter, Ganong, Drew, & Lanes, 2004). The women were not passive care recipients; the experience was one of sorting, protecting, and mobilizing standbys and working with them on tasks associated with living alone (Porter, 2005b). Markers of trust were discerned relative to nonprofessional providers (Porter & Lasiter, 2004), as were speculations about actions of professional providers (Porter & Ganong, 2005b) and expectations of home-care nurses (Porter, 2005a). Intentions included deciding whether a nonprofessional helper could be trusted (Porter, Lasiter, & Poston, 2005) and taking actions to allow providers access to the home (Porter, 2007a). A data-based perspective on home-care satisfaction was offered (Porter, 2008b). The complexity of the home-care experience was illustrated in a case study with one widow (Porter, 2008a). Some experiences with personal emergency response systems were detailed (Porter, 2003, 2005d), as were problems with food preparation (Porter, 2007c), difficulties with daily activities (Porter, 2007b), and incidents with troublesome visitors (Porter & Lasiter, 2007). In a report on transitions of widows who had lost a standby helper, Porter and Ganong (2005a) concluded that continuity of care must extend beyond the home-care agency to the community.

Three main implications for nursing practice result from the research literature. First, nurses should teach clients and families communication skills to promote productive dialogue about pre- and post-bereavement issues. Nurses also should consider that although widows and widowers have suffered a loss, the overall impact of bereavement varies with the individual just as it varies for each individual over time. Nurses should carefully assess widowed persons for stressors, coping strategies, and risk factors for complicated bereavement while recognizing that intentions about continuing one’s life are also basic. Finally, regardless of practice setting, nurses should engage widowed clients in dialogue about their intentions vis-à-vis health-related experiences and make every effort to align plans of care with those unique intentions.

Little methodological diversity was evident in this set of research reports about widowed persons. Nurse researchers should explore associations among variables associated with bereavement and widowhood and test interventions to enable adjustment to bereavement and to promote health during widowhood. Although qualitative work is still warranted on many topics, we offer several recommendations as to approach. First, researchers should propose aims that are consistent with the discovery thrust of qualitative work. The aim to compare facets of a dualism, such as supportive and non-supportive experiences (Scannell-Desch, 2005a, 2005b), is more consistent with verification than discovery. Second, rigor could be enhanced by adopting and reporting detailed strategies for collecting, managing, and analyzing data. Few details were provided about methods such as content analysis (Rushton, 2007) and thematic analysis (Bent & Magilvy, 2006). Finally, in describing or interpreting social support, a critical factor in bereavement and in widowhood, nurse researchers should consider moving beyond the dichotomy of positive–negative support to the dialectical view proposed by other disciplines.

We also identified implications for design, inclusion criteria, and sampling that are pertinent to both qualitative and quantitative studies. Because widowhood is rarely a short-term experience, longitudinal designs would yield more useful information than the usual cross-sectional designs. Duration of widowhood is a particularly critical inclusion criterion, but Scannell-Desch (2005a, 2005b) was one of the few scholars who carefully defined such a criterion. Bent and Magilvy (2006) called for attention to diversity in sampling and greater restrictions on inclusion criteria in studies with widowed persons, but there is an inherent conflict in those two objectives. Nurse researchers must continue to approach recruitment creatively while restricting enrollment to inclusion criteria that emanate directly from the research problem.

Nurse researchers have focused on older widowed persons, primarily women. The increasing interest in younger and midlife widows, widowed persons of both genders, and diverse U.S. and international subgroups is encouraging. Researchers should continue to illuminate needs of vulnerable subgroups, including parents of young children and persons at-risk for age-related conditions. Although widows outnumber widowers, the dearth of research with widowers remains problematic; more studies yielding gender comparisons are needed.

With regard to research topics, scholars must reveal variations in experiences among widowed persons due to demographic characteristics. Given the recent understanding of family as broader than kin, some persons might experience "widowhood" without being legally or socially identified as widowed; this topic warrants further study. Further research is needed on transitions in care and home-care satisfaction, particularly as technological innovations permit aging in place. A meta-synthesis of qualitative findings about bereavement of older widows is warranted. Finally, nurse researchers should actively engage in interdisciplinary dialogue about theoretical and empirical relationships between the concepts of bereavement and widowhood. Each person could provide different data about the same loss over time; persons who have been widowed for the same period of time provide unique data about being bereaved. To individualize interventions, nurses must understand the bereavement experience, how it changes over time, and how it interfaces with the experience of being a widowed person to influence health.

Eileen J. Porter
Kathy A. Johnson

WOMEN'S HEALTH

"Women's health" is a phrase that has changed dramatically in meaning over the past few decades. Although it used to denote a focus on health care issues that affected only women—historically involving matters such as gynecologic, reproductive, obstetric, and breast health or disease—it now denotes a focus on the experience of women with health. This encompasses an expanded biopsychosocial perspective that takes into account the overall well-being of the woman, which is shaped by the fit between the woman and her environment. In this new era, women's health is concerned not only with women's diseases, but their diseases, too, and coincides with Nursing's longstanding emphasis on the interface between and among genetic, physiologic, psychosocial, economic, cultural, generational, developmental, and lifestyle factors in determining health. Women's health now includes women's experiences with all health and illness states, and, importantly, woman's responses to these various states.

Women's health research began as a critique of existing practices and their effects on women's well-being. In 1985, the Public Health Service Task Force on Women's Health Issues examined the role of the Department of Health and Human Services in addressing women's health and found that women were often not included as subjects in health research. Women, especially women of childbearing potential, had historically been excluded from the first two stages of drug testing due to concerns about affecting current or future pregnancy outcomes and effects from normal hormonal changes in women subjects during trials. Even female animals had typically not been used in constructing animal models because of "their hormonal fluctuations." The health problems that women suffer from disproportionately were also not often studied, for example, osteoporosis, breast and ovarian cancer, urinary incontinence, the autoimmune diseases, violence, and poverty.

Health had been construed such that male behavior was regarded as normative, and research conducted exclusively on males was typically generalized to all human beings. When women did not fare as well with the same treatment, they were regarded as atypical. It was simply not considered that the female body responded to health problems and to treatment modalities differently from the male. From Freud to Kohlberg, theoretical models had been constructed so that women were regarded as less developed when they did not act in a fashion similar to men. Even when studied, the sociocultural factors shaping health problems in girls and women were ignored, for example, the relationship between learned helplessness and some kinds of depression, and between anorexia and the popular (yet unhealthy) admonition that you can never be too rich nor too thin.

Social health systems also had been prejudicial in important respects. Insurance policies did not necessarily cover health matters unique to women, for example, breast prostheses post mastectomy. Women were not in research and policy-making positions proportionate to their numbers, responsibilities, and educational preparation. The burden of family caregiving that women largely bear remained invisible, notably in estimates of the gross national product.

The Office of Research on Women's Health (ORWH) was established in 1990 within the Office of the Director of the National Institutes of Health (NIH) to address these lacunae. A decade later, not coincidentally, the majority of human subjects enrolled in all extramural NIH research were women, and they were represented in Phase III clinical trials.

Often led by nurses, women's health research became relatively mainstream in the ensuing years. S. K. Donaldson (2000) analyzed the achievements of nursing research between 1960 and 1999 and identified substantial strengths in the area of women's health. The Center for Women's Health Research at the University of Washington, supported by the National Institute of Nursing Research, has increased the understanding of menstrual cycle change, including the menopausal transition (Mitchell, Woods, & Mariella, 2002). The center has also played a role in translational research, for example, offering a video presentation to help women in deciding if hormone therapy is appropriate for them (Woods, 2002).

One area of common concern to the first five Centers of Geriatric Nursing Excellence funded by the Hartford Foundation is the experience of family caregivers, who are largely women (Archbold & Stewart, 1996). Nurses have also brought new understandings to other developmental transitions, for example, the experience of women as mothers/grandmothers (McBride & Shore, 2001), and how puberty may differentially affect girls in comparison to their male counterparts (Austin, Dunn, & Huster, 2000). The ORWH has collaborated with various NIH institutes to fund Specialized Centers of Research of Sex and Gender Factors Affecting Women's Health. The one based at the University of Michigan is conducting research on the pelvic floor, and nurses have pioneered therapeutic use of pelvic floor muscle training in women (Miller, 2002).

Because one of its fundamental beliefs is the need to proceed from an understanding of the person–environment fit, nursing has long been concerned about the importance of context in understanding health behavior. Nurse midwives, for example, tend not to talk about "delivering the baby," preferring instead to focus on the mother and how she would prefer her labor and delivery to go. Nurses were among the first to question a preference for the so-called objective view of the researcher, historically male, over the subjective view of the patient (McBride & McBride, 1981). They took the lead in use of the diary/health journal as a way to analyze the complexity of women's reality. The research that has resulted has been informed by how women describe their lived experience. A feminist ethic has emerged that is neither focused on "doing good" nor "doing unto others what one would wish for oneself" but rather with providing care that builds on the patient's own perceptions of what is good for her.

The ORWH, which celebrated its 20th year in 2010, developed an Agenda for Research on Women's Health for the twenty-first century (Pinn, 2001). In 2009, the ORWH held public hearings and multidisciplinary scientific workshop meetings in multiple locations to update the agenda. The purpose of this very public method for discussion was to ensure that women's health will remain in the forefront of scientific work and that it will be addressed in a comprehensive manner. The very methods used for identifying and defining the priorities in research for women are aligned with nursing's approach to research and care—seeking input from the public, multiple health disciplines, and scientists. Many of the ORWH's identified priorities continue to dovetail with the focus of nursing research; for example, interdisciplinary approaches to chronic multisystem diseases with multifactorial etiology, caregiving, diversity and health disparities, gender differences in health and illness, and health-related quality-of-life issues. Indeed, most of the research centers supported by the National Institute of Nursing research focus on healthy living and the prevention of chronic disorders, health disparities and vulnerable populations, or quality of life in chronic illness. Developing effective ways to manage chronicity, as opposed to serial management of a number of diseases, is of particular concern to nurse researchers.

Women's health research has made major strides in the inclusion of females as research subjects and is moving toward understanding variances in experiences of women in diverse groups. Women vary significantly according to their circumstances.

Thus, nursing research does not just include girls and women, rather nurses are looking at experiences of women in heretofore understudied populations, for example, the diverse cultures, the women of color, the elderly, the rural and inner-city women, the poor, the lesbians, and the women with disabilities. The resulting findings are fueling a movement toward greater emphasis on the design of tailored interventions.

Nurses are also at the forefront of redefining natural life events as normal and asking women to identifying ways to manage such events that work in the context of their daily lives. Women of varied ethnic and socioeconomic backgrounds are increasingly interested in actively self-managing their own health issues (Alexander, 2010; MacLauren & Woods, 2001) and using natural therapies such as complementary and alternative medicine instead of seeking traditional medical care (Brett & Keenan, 2007; Daley et al., 2006; Keenan et al., 2003; Newton, Buist, Keenan, Anderson, & LaCroix, 2002). Women have indicated a high satisfaction in working with nurse practitioners (Alexander, 2004) because of the nursing philosophy nurse practitioners use of supporting a patient and working in a partnership with her to achieve mutually identified goals as opposed to directing her care.

The menopause transition provides excellent examples of the work nurses are doing to dismantle the medicalization of a natural life event. Menopause symptom management had become highly medicalized because symptoms associated with the menopause transition were seen as a "problem" that required "fixing" by medicine. As the medicalization of menopause is being dismantled, women are reclaiming menopause as a normal life transition (Alexander, Motter, Ruff, Rousseau, & White, 2005; Alexander et al., 2003, 2004; Kaufert, Boggs, Ettinger, Woods, & Utian, 1998; MacPherson, 1981; Woods & Mitchell, 1999). More women report that menopause is a normal life change than ever before. With this shift, many women, especially women of color, are interested in identifying lifestyle changes for managing symptoms, reserving medication for severe symptoms and only if nonpharmacological methods for symptom management are unsuccessful.

Nursing research is recognizing the importance of quality of life in the menopause transition and taking a fresh look at what symptoms are experienced and which experienced symptoms are bothersome (Alexander et al., 2003, 2004). This work goes beyond national studies evaluating menopause symptoms such as the Study of Women's Health Across the Nation (Avis et al., 2001; Gold et al., 2000). Several previously unrecognized yet bothersome symptoms were identified because the women themselves were asked to provide firsthand accounts of their experiences instead of responding to defined symptoms on a questionnaire (Alexander et al., 2003, 2004).

Nurses are also asking women what strategies they are using to manage bothersome symptoms associated with the menopause transition and what strategies they are willing and interested in trying for symptom management. Women have identified creative self-management strategies such as diet changes and exercise, stress management practices, and biofeedback (Alexander et al., 2003, 2004; MacLauren & Woods, 2001). Complementary and alternative medicine therapies such as acupuncture have been studied to identify efficacy in reducing symptoms associated with the menopause transition (Cohen, Rousseau, & Carey, 2003). Woman have been asked about their use of botanicals, vitamin and mineral supplements, nonhormone prescription medications, and homeopathy and how effective these therapies were (Kupferer, Dormire, & Becker, 2009).

Nursing focuses on providing care to women in an individualized manner. After the surprising results of the Women's Health Initiative were revealed, which identified the possibility that the risks of estrogen–progestin hormone therapy outweighed benefits among postmenopausal women (Rossouw et al., 2002), the National Association of Nurse Practitioners in Women's Health was one of the first organizations to decipher the results and call for individualizing care for each woman (Wysocki, Alexander, Schnare, Moore, & Freeman, 2003). Instead of identifying hormone therapy as too great a risk to be used for any woman, Nurse Practitioners in Women's Health leaders called for thoughtful interpretation of results and careful evaluation of each woman's risk factors, personal and family history, and clinical symptoms in addition to her individual preferences for symptom management (Wysocki et al., 2003).

Nursing research and scholarly work related to the menopause transition has provided unique and important knowledge that adds to the field of women's health. It also provides a framework for developing research that questions what is known and assures that the woman's voice is clearly heard with regard to identifying what symptoms are occurring, what symptoms are bothersome, and how to best manage bothersome symptoms.

The next challenges faced by nursing in the many areas of women's health research are to further expand the current understandings of health and illness in women of varied ethnic, racial, and cultural backgrounds. It will be important to continue to explore women's responses to health, illness, and their environments and women's preferences for varied approaches to maximizing health and managing disease. Nurse researchers must be careful to not wholly reject "biology as destiny," so that women's health research will not inadvertently minimize the physiologic pathways involved in responses to stressful psychosocial conditions. Future research must, therefore, be concerned with women's experiences that exist within the interface between the behavioral and the biomedical sciences to provide additional insights into sex versus gender differences.

Ivy M. Alexander
Angela Barron McBride

WORKPLACE VIOLENCE

Workplace violence is defined as "violent acts (including physical assaults and threats of assaults) directed toward persons at work or on duty" (Centers for Disease Control and Prevention/National Institute of Occupational Safety and Health, 2002). Most workplace violence falls into one of four categories:

Type I (Criminal intent): results while a criminal activity (e.g., robbery) is being committed and the perpetrator has no legitimate relationship to the workplace.
Type II (Customer/client): the perpetrator is a customer or client at the workplace (e.g., health care patient) and becomes violent while being served by the worker.
Type III (Worker-on-worker): employees or past employees of the workplace are the perpetrators in this case.
Type IV (Personal relationship): the perpetrator in this case usually has a personal relationship with an employee (e.g., domestic violence in the workplace).

Nonfatal assaults are much more common than fatal assaults, especially in health care. However, current surveillance systems capture fatal assaults better than nonfatal assaults because of widespread underreporting and difficulties obtaining data on less visible forms of workplace violence (Barling, Dupré, & Kelloway, 2009). According to the Bureau of Labor Statistics (BLS), assaults and violent acts were the second leading cause of occupational injury or death among all workers, and is the leading cause among women in 2009. Between 2004 and 2008, an average of 564 workers per year died as a result of workplace violence (BLS, 2010). By comparison, the Department of Justice's National Crime Victimization Survey (NCVS), estimates that 1.9 million incidents of nonfatal workplace violence occurred in the workplace each year from 1992 to 1996 (Warchol, 1998). Twelve percent of all victims reported physical injuries, 6% of the workplace crimes resulted in injury that required medical treatment, and only 44% of all incidents were reported to the police. A more recent report from a nationally representative study found that 41.4% of all workers reported incidents of psychological aggression, whereas 6% reported incidents of physical aggression at work (Schat, Frone, & Kelloway, 2006).

Workplace violence (Type II) is a documented occupational hazard in the health care and service sectors (Centers for Disease Control and Prevention/National Institute of Occupational Safety and Health, 2009; Lipscomb & Love, 1992; Warchol, 1998). In the United States, the health care sector leads all other industry sectors in the incidence of nonfatal workplace assaults. From 1994 to 2005, nursing, psychiatric, and home health aides were victims of nearly 30% of workplace assaults resulting in lost workdays, which was the highest proportion of assault injury by broad occupational grouping in the United States (BLS, 2006). In 2005, the BLS rate of nonfatal assaults among health care workers was 8.8 cases per 10,000, which was nearly four times higher than in the overall private sector workforce. Among these assault victims, 30% were government employees, even though they make up only 18% of the workforce.

The more sensitive NCVS, a population-based household survey, provides rates of violent crimes by occupation. In 12% of the 1.7 million episodes of workplace-related violence annually in the United States, the victim was a health care or mental health care worker. According to the NCVS, mental health professionals had an incidence rate of 68 per 1,000 workers compared with an overall rate of 12 per 1,000 workers. Nurses had an incidence rate of 22 per 1,000 workers, the highest rate in the "medical" category. Rates for other nurse specialties or units were not available, but it is well recognized that emergency department personnel face a significant risk of injury from assaults by patients or their families; with weapon-carrying presenting the opportunity for severe or fatal injuries. A recent survey of 69 U.S. emergency departments found that 20% reported that guns or knives were brought to their emergency departments on a daily or weekly basis (Kansagra et al., 2008).

Violence in mental health has an extensive history, with the first documented case of a patient fatally assaulting a psychiatrist in 1849 (Bernstein, 1981). Until the 1990s, most studies that examined the risk of violence to psychiatrists and other therapists focused on the victim's role, the assaultive patient's characteristics, and contextual factors surrounding the assault. Since that time, research has included the inquiry of organizational and environmental risk factors; with nurses and aides a focus of study.

Bensley et al. (1997) compared the number of workers' compensation claims from a Washington State psychiatric hospital, formal incident reports, and the number of incidents of assault reported on a survey measuring attitudes and experiences related to assaults. She found that 73% of staff surveyed reported at least a minor injury related to a patient assault in the past year. Only 43% of those reporting moderate, severe, or disabling injuries related to assault filed a worker's compensation claim. The survey found an assault incidence rate of 437 per 100 employees per year, a rate that underestimated incident reports of assaults by a factor of more than five (Bensley et al., 1997).

Environmental and organizational factors associated with patient assaults include: understaffing, workplace security, shift, unrestricted access to movement, and transporting patients (Centers for Disease

Control and Prevention/National Institute of Occupational Safety and Health, 2002). A 2005 National Survey of the Work and Health of Nurses, a comprehensive survey of a large sample of employed regulated Canadian nurses (*n* = 18,676) found that abuse by patients was related to being male, having less experience, working non-day shifts, and perceiving staffing or resources as inadequate, nurse–physician relations as poor, and coworker and supervisor support as low (Shields & Wilkins, 2009). Lee, Gerberich, Waller, Anderson, and McGovern (1999) found that among 105 nurses who had filed a worker's compensation claim for work-related assault injuries, the presence of security personnel reduced the rate of assault, whereas the perception that administrators considered assault to be part of the job, having received assault prevention training, a high patient/personnel ratio, working primarily with mental health patients, and working with patients who had a long hospital stay increased the risk of assault.

The one patient characteristic that has been singled out as a strong risk factor for violence is a history of violent behavior. A number of studies have documented that a small number of patients are responsible for the majority of assaults (Hillbrand, Foster, & Spitz, 1996). Drummond, Sparr, and Gordon (1989) examined an intervention designed to identify patients with a history of violence and found that flagging charts of patients with histories of assaultive or disruptive behavior reduced assaults against staff by 91%.

Many psychiatric settings now require that all patient care providers receive annual training in the management of aggressive patients. However, few studies have examined the effectiveness of such training (Beech & Leather, 2006). Hurlebaus and Link (1997) found a significant improvement in nurses' knowledge but no difference in confidence and safety after taking an aggressive behavior management program. Carmel and Hunter (1990) examined the relationship between participation in training and aggressive behavior by inpatients on 27 inpatient wards in a California State hospital and found that wards with higher staff attendance at the training experienced lower rates of injury. Lehmann, Padilla, Clark, and Loucks (1983) found significantly higher knowledge and confidence in trained staff.

Runyan, Zakocs, and Zwerling (2000) reviewed 137 articles mentioning violence prevention intervention and found that only 10 of the articles reflected a databased intervention. All interventions took place in health care: five studies evaluated violence prevention training interventions (including Lehmann et al., 1983; Carmel & Hunter, 1990), three examined postincident psychological debriefing programs, and two evaluated administrative controls to prevent violence. All were quasi-experimental, without a formal control group and with equivocal findings.

The health care workplace must be made safe for all health care workers through the use of currently available engineering and administrative controls, such as security alarm systems, adequate staffing, and training. The Occupational Safety and Health Administration (1996, 2004) published the *Guidelines for Preventing Workplace Violence for Healthcare and Social Service Workers*, which described the key elements of any proactive health and safety program including: management commitment and employee involvement, a written violence prevention program, a worksite analysis, hazard prevention and control, medical management and postincident response, training, and education, and record-keeping and evaluation of the program. Implementation of the guidelines has been found to be feasible within the mental health and social service work settings (Adamson, Vincent, & Cundiff, 2009; Lipscomb et al., 2006). Findings from the inpatient mental health workplace indicate that a comprehensive violence prevention program is associated with a reduction in risk factors for violence (Lipscomb et al., 2006).

The focus of this entry has been Type II (patient/client) violence; however, no health care setting is immune from other types of workplace violence. With an increase in health care services delivered outside the acute care setting, community-based workers are at risk of serious or even fatal injury from Type I (criminal intent) violence. Type III violence (worker-on-worker), often referred to as "lateral violence" is gaining increased recognition as a major problem in the health care setting.

Workplace violence prevention efforts must be examined within the larger context in which health care is delivered. The wide availability of handguns, limits on public funding for social services, and the need to balance health care worker and patient rights, are all contextual factors that impact the risk of violence within individual health care organizations. Evidence exists to demonstrate the inextricable link between staff safety and the quality/safety of client care. Researchers have found that violence experienced by health care staff is associated with lower patient ratings of the quality of care (Roche, Diers, Duffield, & Catling-Paull, 2009). When staff members are injured, the remaining staff members may have to work excessive overtime or under conditions of short staffing. Replacement staff may not be familiar with the patients and lack crucial information regarding patients' highly individual needs, triggers, and behaviors. In all scenarios, the quality of care suffers.

Research evaluating intervention directly at the primary, secondary, and tertiary prevention of violence across health care settings is critically needed to reduce workplace violence and ultimately improve patient care. A secure and healthful work environment is essential to a positive environment of care.

Jane Lipscomb
Cassandra Okechukwu

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