The Past and Future of Nursing Research

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The past three decades have witnessed a remarkable growth in nursing science development. In both Korea and the United States, nurse scientists are poised to address important issues related to the prevention and management of significant health care problems. The need for greater nursing science development in the areas of self management, genetics, geriatrics, health promotion across the lifespan, technology, and mental health are briefly highlighted. Future research efforts will be enhanced by interdisciplinary collaboration and the creation of international nursing research centers. At the same time, we need to remain cognizant of the importance of mentoring future nurse scientists. [Asian Nursing Research 2007;1(1):4–10]

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Thank you for the opportunity to be part of the inaugural issue of this important Asian Nursing Research journal. Research and nursing science development have been at the forefront of Korean nurses’ mission. This paper provides broad examples of what nurse scientists have accomplished as well as some thoughts regarding priorities for future scientific efforts. Both in Korea and the United States (U.S.), nursing science as a discipline has retained an emphasis on methodological precision, while applying that rigor to increasingly complex issues of patient health. Our science has progressed from early papers and conferences focused on how to do research to substantive knowledge development in key research areas of health promotion, disease prevention, clinical therapeutics, family and community interventions, health informatics and evidence-based practice to name a few. Compared to other sciences, nursing science is relatively young; however, we have made great strides and should be proud of these accomplishments.

In the early years of nursing science development, the conduct of research was viewed as a prerequisite to full consideration as a profession. As Marge Batey (1968) noted in the Preface of the first volume of Communicating Nursing Research, “As nursing gropes for its maturity, it is coming to recognize its responsibility as a profession to search for and to build a broader and a sounder knowledge base for its professional practice.” No longer should nurses be seen as only the focus or subjects of study from an anthropological or sociological perspective, but should be...
seen as scientists conceiving and conducting the studies needed to inform professional nursing practice. In 2003, Donaldson urged nurse researchers to consider issues of professionalism or the elevation of the status of nursing secondary to the development of science related to health. She wrote, "...in deciding future directions for nursing research and science, it better fits nursing's societal mandate to have as the highest priority understanding and improving the health status of those whom we serve."

Based on the U.S. National Institutes of Health roadmap initiatives, I have attempted to reflect in this paper the contributions of nursing science to predictive, preemptive, personalized (or patient-centered), and participatory health care.

**PREDICTIVE**

Over the past two decades, we have seen a dramatic increase in the inclusion of genetic markers into nursing research studies. Understanding disease risk and vulnerability through genetic markers may be keys not only to predicting disease development but also to predicting who might benefit from a particular therapeutic strategy. The sequencing of the human genome has taken us from understanding single gene disorders (e.g., Huntington’s disease, cystic fibrosis) to having the basic knowledge to examine more complex, multifactorial (multiple gene) disorders such as heart disease, diabetes, pancreatic cancer, and alcohol abuse. As an example, in our laboratory we have examined alleles of the serotonin reuptake transporter protein as an approach to understanding the link between depression and symptom experiences in women with functional bowel complaints (Jarrett et al., in press). Such results are intriguing and may set the stage for selecting tailored or personalized therapeutic options for patients based on their genetic profile. In future, we may be using genetic markers with critical care patients to determine therapeutic strategies for those patients with acute respiratory distress syndrome or multiorgan failure. The next step will be proteomics as we examine not only the genetic susceptibility but the expression of genes.

While genetic information may help guide decision-making, it also brings with it ethical issues related to confidentiality as well as the impact of disclosure of genetic risk in cases where there is no cure (Lea, Williams, & Donahue, 2005). Schutte and Holston (2006) wrote that we need to consider how ethnicity, culture, and health literacy influence the utility and desirability of genetics information and technology. Nurse scientists and nurse ethicists are providing critical guidance as we move forward in our understanding of genetic vulnerabilities (Frazier, Meninger, Lea, & Boerwinkle, 2004).

Increasingly, our attention must be given to the issues of mental health disorders because of their link to physical health and quality of life. In 2006, the U.S. National Institutes of Mental Health Director Thomas Insel noted, “After six decades of progress, mental disorders remain unacceptably common, causing more disability in people under age 45 than any other class of non-communicable medical illness.” Basic science can provide information on genetic susceptibility to such disorders, neuroscience can inform us about neuroanatomical alterations linked with mental disorders, and neuroimaging can provide earlier diagnosis. However, research is critically needed to examine environmental influences particularly during early development, behavioral risk factors, compliance with therapy, behavioral therapies, and family support. Because of nurse scientists’ expertise in both qualitative and quantitative measurements as well as behavioral therapy, we are well poised to contribute to this research agenda.

Research regarding stress and depression and anxiety suggests that stress may serve as a trigger of not only physiological responses but also of mental illness in genetically susceptible individuals. For example, exposure to stress during critical periods of development may lead to subsequent mental health problems later in adolescence or adulthood. Stress and post-traumatic stress disorder are linked to a number of functional disorders such as irritable bowel syndrome, fibromyalgia, insomnia, migraine headaches, chronic fatigue syndrome, interstitial cystitis, and chronic pelvic pain. Stress and depression are also linked to heart disease as well as other medical disorders.
One example from the Korean nursing community is the work of Son (2007) who described a positive relationship between hostility and serum homocysteine levels in patients with coronary artery disease. We are challenged to consider “what is the physiologic link between stress and physical ailments?” and “what is the interaction among stress, genetic predisposition, personality, gender, culture, and environmental influences and disease expression and outcomes?”

Understanding genetic risks and disease prediction will increase the average lifespan as well as enhance the quality of life of individuals living longer. An examination of the demographic trends from Korea and the U.S. as well as other industrialized countries makes it evident that the percentage of individuals over the age of 65 is rapidly increasing. This anticipated increase in the number of older adults makes it imperative that there is greater understanding of how to improve the quality of life of older individuals. For example, efforts are needed to reduce disability due to chronic illness, test health promotion strategies to reduce chronic illness, and develop strategies to reduce caregiver strain. Nurse researchers have made profound contributions to the understanding of aging in a number of important areas including the clinical management of dementia, urinary incontinence, heart failure, as well as coronary artery disease and stroke prevention. Centers of excellence focused on research and education related to aging are needed. It is essential that these centers be collaborative and interdisciplinary. Interventions to reduce caregiver stress have been developed and tested but await broader implementation.

**PREEMPTIVE**

Preemptive therapies are those directed at a time before the symptoms and damage occur such as in the case of osteoporosis, heart disease, and type 2 diabetes. We now realize that many diseases such as osteoporosis and cardiovascular disease seen in adults actually have their origins in childhood. As such, interventions directed earlier may avert or postpone problems later in life.

The last 25 years has shown us the impact of globalization on health, particularly in the area of infectious disease. HIV, hepatitis, tuberculosis, bird flu, and SARS are but a few examples of infections that spread across geographic boundaries. At the public health level, there are monthly alerts about the potential for devastation due to avian flu. Clinicians within our health care institutions are very concerned about methicillin-resistant *Staphylococcus aureus*, vancomycin-resistant *Enterococcus*, and *Clostridium difficile*, which are pervasive and pose grave risks for vulnerable clients. The work of Elaine Larson (Kretzer & Larson, 1998) has informed us about the challenges of instituting and maintaining routine procedures such as hand-washing and the use of antimicrobial products. Several investigators have examined the impact of routine nursing practices (e.g., catheter care) on infections in hospitalized patients. Recent work has demonstrated that monitoring systems can reduce the incidence of catheter-related infections (Saint, Kaufman, Thompson, Rogers, & Chenoweth, 2005). However, much work remains to be done in terms of preventing ventilator-associated pneumonia and *C. difficile*. Even less is known about the long-term sequelae of these infections acquired in acute care settings.

At the individual level, we have challenges related to identification and treatment of chronic infectious disorders including HIV, hepatitis B virus (HBV), and hepatitis C virus (HCV). At this time, it is estimated that 10% of the Korean population is chronically infected with HBV; 1.25 million Americans are chronically infected with HBV—the majority of whom are of Asian descent (Hepatitis B Foundation, 2007). At the same time, 4.1 million (1.6%) Americans have been infected with HCV, of whom 3.2 million are chronically infected. With drug therapy seroconversion rates less than ideal, liver transplantation is increasingly used. Enhancing self care and ultimately quality of life for these vulnerable individuals remain a high priority. We are beginning to understand the linkages between infections and other disorders include gastric cancer, cervical cancer, hepatocellular cancer, and autoimmune disorders. Vaccines when available have substantially reduced the risk of

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chronic HBV. Longitudinal studies are needed to determine the impact of vaccination on the rates of HBV-associated hepatocellular cancer. However, access to vaccines is not universal.

While basic scientists rush to develop vaccines and better antibiotics, there is still the challenge of developing safe interventions to enhance prevention and compliance. Investigators remain concerned about disparate health literacy levels among our populations and its impact on health promotion as well as self management. For example, the recently developed human papillomavirus vaccine will necessitate understanding of how persons from a variety of sociocultural backgrounds make decisions related to prevention and health behaviors.

Prevention infers changes in health-related behaviors. Nurse scientists have explored strategies to enhance smoking cessation, reduce alcohol consumption, and increase weight loss as important routes to decreasing disability. Globalization has made obesity a growing worldwide problem in industrialized nations. Recently, while in Seoul, Korea, I noted 3 Starbucks, 3 Dunkin Donuts, 1 Krispy Kreme, 1 Burger King, 1 MacDonalds, and 3 Outback Steakhouses within walking distance from my hotel. The associated increased risk of cancer, arthritis, sleep disturbances, diabetes and its complications, and cardiovascular disease have resulted in concerns about the overall negative impact of obesity on the average lifespan.

The rising rates of obesity, metabolic syndrome, and type 2 diabetes are multi-component problems. Decreasing levels of physical activity beginning early in life and increasing access to high fat foods contribute to expanding waistlines of many individuals living in industrialized countries. From a women’s health perspective, there are vulnerable periods (puberty, pregnancy, menopause) when weight gain is more likely. There are clear gender-related differences in where weight is gained as well as the metabolic consequences of that gain. At the same time, there are discouraging data about the efficacy of diet therapy and exercise adherence. In the U.S., the number of bariatric procedures has increased from 11,111/year in 1996–1998 to 106,242/year in 2002–2004. In Asia, the number of bariatric procedures is rapidly rising as well (Lee & Wang, 2004). While nurse researchers have been engaged in obesity research at a number of levels including genetic predisposition, metabolic syndrome, and exercise adherence, even greater attention is warranted. The results of studies need to be disseminated and used to form the basis for public policy changes such as mandatory physical exercise in grade schools, healthy food choices in vending machines, foods in school cafeterias, and health promotion activities in the work place.

PERSONALIZED

Given the growing database related to genetic predisposition, disease pathogenesis and behavioral factors that predict successful outcomes, individualized interventions can now be designed and tested. One area for which tested interventions are clearly lacking is end of life (EOL) care. The bulk of the science to date is derived from patients in the last stages of cancer. Despite the substantial number of deaths due to cardiovascular, respiratory, and neurological disorders and injuries, there is a dearth of data-based literature available to guide EOL practice for patient groups. In December 2004, the U.S. National Institutes of Health convened a conference to review the scientific evidence related to EOL care. This state-of-the-science conference brought together researchers from a variety of disciplines (nursing, medicine, social work, psychology, public health). Nurse investigators presented on diverse topics including EOL care for pediatric patients, family support during palliative and EOL care, symptom management, and interprofessional communication challenges. Research priorities were identified including strategies to enhance communication among patients, family members, and health care professionals, symptom management, and caregiver burden.

By the 1990s, chronic disease had superseded communicable diseases as the leading cause of death in all parts of the world except sub-Saharan Africa and the Middle East. In all likelihood, chronic diseases will be the predominant global source of morbidity,
death, and disease during the 21st century (McQueen, 2007). For example, new treatments and earlier detection mean that the number of cancer survivors will increase.

Research on interventions for patients with chronic illnesses has been a central theme of many nurse investigator initiatives. In particular, an impressive body of knowledge on self management has already been developed. As Lorig and Holman (2003) at Stanford University pointed out, it is the patient with a chronic illness who becomes his own principal caregiver. Elements of therapy including diet, exercise, self-assessment, and medication taking are increasingly under the patient or family member’s control and much of this information is taught by nurses. But we know that teaching is not enough to change behavior. The term patient education should perhaps be replaced by the term supporting self-management. Self-management support involves assisting patients and their families to acquire the knowledge skills and confidence to manage their chronic illness including routine follow-up and assessment (Bodenheimer, Wagner, & Grambach, 2002).

The work of nurse investigators has ranged from individual management of diabetes to community-based interventions to empower patients with the knowledge and skill to manage symptoms and to enhance adherence to therapeutic regimens. Many of these interventions result in reductions in health care costs as well as enhance quality of life. Despite these impressive scientific findings, many of these interventions await wide-scale implementation. The delay is due in part to the multi-component nature of most interventions. Clinicians often ask “which component is most beneficial, or what dose of the intervention is needed?” So while we have data to support that our interventions work, we may not know why or how they work. For example, do they need to be delivered as a package or can individual elements be just as effective? Who is most likely to benefit? Our clinical trials research cannot be constrained to addressing the simple question of what therapies work best. We must also ask for who do they work best? Understanding individual differences in biology, culture, and socioeconomic resources are important in predicting how a person will react to a certain medication; these same factors will also likely predict response to behavioral therapies.

In the coming years, we must address the question of how technology can be better utilized to provide interventions and enhance outcomes. For example, do we know the ultimate results of our increasing technology on patient outcomes? With the rapid explosion of patient information systems and evidence of best patient care practices, how can strategies be implemented and tested to ultimately increase patient safety, reduce clinical errors, and redesign services to increase efficiency and patient satisfaction? At the same time, nurse scientists engaged in biobehavioral research need to keep abreast of new technologies to enhance their research capacity.

PARTICIPATORY

Nursing, as a profession, has long been concerned with issues related to access to care along with inequities in the quality of that care. In the future, health disparities research will continue to represent an important target for nurse investigators. Programs such as Center for Vulnerable Populations Research Nursing at the University of California at Los Angeles have made important methodological contributions related to participatory action research. Factors such as race, culture, economic status, rural versus urban environment, age, and gender may all contribute to inequities in the quality of care received. For example, research over the past 20 years has demonstrated inequities in pain management, access to diagnostic procedures, as well as overall survival rates. Participatory research can inform us as to the patient’s, family’s or community’s perspectives of health care quality so that overall improvements can occur.

SUMMARY

When discussing each of the topics above, I have made mention of several exemplars of nursing research and have implied that nurse investigators have played
important scientific and leadership roles. There are several areas that we need to enhance and strengthen. First, we need to increase the dissemination of our research findings. We need to continue to value the importance of publishing beyond our discipline and to communicate in the language of other disciplines not just our own. We are accountable to society for our research both in the formulation of the questions we ask and in the dissemination of our findings to clinicians and the lay public (Donaldson, 2003).

Second is collaboration. The achievement of the goals that the provision of health care be predictive, preventive, personalized and participatory necessitates that it be interdisciplinary. At one time, we used the term *multidisciplinary* to denote the type of research where multiple disciplines were engaged to focus on a specific question or problem. Interdisciplinary (or interprofessional) research can be viewed differently. It can be defined as the coming together of different disciplines, again focused on a specific problem, but in this case a new discipline or new science emerges. The classic example of this is the merging of neurology with biology to create neuroscience. In our own discipline, we have seen this with the merging of science related to physical or mental symptoms/illness with behaviors to create a biobehavioral research perspective.

While other disciplines may grapple with the definition of interdisciplinary science and how to negotiate these collaborations, nurse scientists have enjoyed a long tradition of this approach to science. In 1973, Jeanne Benoliel wrote, “the development of scientific knowledge in nursing depends on research-oriented individuals who are capable of both collaboration and competition in the search for new ideas. To date, nurses in research have demonstrated considerable proficiency in the art of collaboration...” Nurse scientists need to be actively engaged in leading multidisciplinary review committees, providing membership on advisory councils and receiving research funding from diverse institutes and foundations. The days of the single investigator and perhaps the single institution or center may be behind us as we move forward into this era of interdisciplinary research. Innovative techniques for analysis and data collection will increase our capability to share data and maximize the impact of our research on health outcomes.

At the same time, we need to consider how technology might be used to provide interventions and enhance patient outcomes across care settings including the home and community. Third, we need to be visible. When benchmarks of our success in health care research are listed, it will need to include more than funded grants and published papers. Professional organization leadership particularly as it relates to policy changes is equally important. Such efforts not only serve as important signposts for the integration of our science with others but also provide unique opportunities for guiding the direction of science. Fourth, we need to tend to the growth and development of the next generation of a diverse cadre of nurse scientists.

Nursing science is a relatively new discipline when considered in light of medical and basic science research which date back to the 18th century. Despite our relatively brief period in this arena, nurse researchers have shown themselves adept at not only conducting the research necessary for science development but also the enhancement of health outcomes. In a landmark paper by Donaldson and Crowley (1978), they observed that the discipline of nursing was defined as that which is characterized by “a unique perspective, a distinct way of viewing all phenomenon, which ultimately defines the limits and nature of its inquiry”. They further expanded this definition to state that the science of nursing is characterized by three themes: a) principles and laws that govern life processes, wellbeing, and optimum function during illness and health; b) patterns of human behavior in interaction with the environment in critical life situations; and c) processes by which positive changes in health status are affected.

Whether these characteristics are truly unique to our discipline is for philosophers to debate. I would like to pose the question: Are we ready to move beyond the term *nursing research* to the more encompassing term *health care research*? In 1970, M. Batey wrote, “Increasingly I have come to view the object of nursing to be health care”. We have challenged our medical colleagues to use more generic terms...
such as health care providers, clinicians and clinical researchers, but are we poised to conduct research that is truly interdisciplinary? Are we prepared to expose or share our work in the wider health care research arena? To develop new therapeutics that blend the biological with social and spiritual domains of health? Let us aim that by the 10th anniversary of the journal (and let’s hope that it is sooner), our central focus will be on understanding human health in an inclusive, integrative manner.

REFERENCES


