Published in final edited form as:

Res Gerontol Nurs. 2013 January ; 6(1): 5–8. doi:10.3928/19404921-20121204-03.

Commentary on the State of the Science in Gerontological Nursing: Advances in Non-Pharmacological Interventions during 2011–2012

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In 2011 the National Institute of Nursing Research (NINR) celebrated a quarter century of advancements in nursing science that made an extraordinary impact on the health of our nation. The report, *Bringing Science to Life, NINR Strategic Plan* (National Institute of Nursing Research, 2011), describes breakthrough research that has vastly improved health outcomes for the most vulnerable patient populations we serve. *Research In Gerontological Nursing* has made a commitment to publicizing the outstanding work of gerontological nurse scientists in an Annual Commentary on the State of The Science. In this inaugural commentary, we build on the NINR Report by reflecting on critical scientific advances that are currently being made in the area of non-pharmacological interventions for the nursing care of older adults. Effective non-pharmacological nursing interventions are especially appropriate for older adults because of the low cost and low risk of associated side-effects. Non-pharmacological interventions can be considered alone or as a first step in the management of a variety of problems, and should be continued as they are augmented by appropriate pharmacological, surgical or other types of complementary interventions. This focus is quite timely in light of the recent Centers for Medicare & Medicaid Services initiative aimed at improving behavioral health and reducing unnecessary antipsychotic drug use in nursing. This focus is also directly responsive to Americans' need for safe, accessible, high quality, and affordable care.

In this commentary we limited our review to published literature in 2011–2012, and chose a few examples of non-system interventions, i.e., those that are implemented in the context of direct, hands-on-care. In our search strategy we selected areas of intervention science that enjoy a strong basis, built over many years of investigation. These interventions include those that: relieve pain; improve physical function; reduce behaviors associated with cognitive impairment; promote sleep; and enhance end-of-life care. We also highlight examples of research that are currently being conducted, offering exciting and innovative solutions to costly clinical problems. Finally, we outline priorities for future research and address our capacity as nurse scientists to advance the science of nursing care.

Pain

Nursing research has long focused on implementing behavioral interventions to manage pain in older adults. Over the past year there have been some interesting approaches used that can guide clinical nursing as well as inform future research.

Probably one of the most exciting and challenging areas of pain management research is the use of exercise as an intervention to decrease pain. Within the prevailing approach, healthcare providers assume that pain is an indication that one should *not* move or engage in any type of activity but rather that the painful joint or area be rested. Two studies tested the effects of exercise on pain management among older adults and demonstrate the benefits of exercise on reducing pain (Park, McCaffery, Dunn, & Goodman, 2011; Tse, Wan, & Ho,

2011). In the Tse, Wan and Ho (2011) study, the investigators recruited 73 cognitively intact older adults in a nursing home and tested the effectiveness of an eight-week program using a pre-post test design. The weekly one hour program, provided by a physiotherapist and nurse, involved 15 minutes of warm up exercises, followed by muscle strengthening, stretching, balance, towel dance, acupressure and massage. Specific exercises to help relieve painful areas were given on an individual basis and participants were provided with a pamphlet of pictures of the exercises to do on their own. On completion of the program, there was a significant reduction in pain intensity among the participants. While pilot in nature, this study supports important information on the benefits of exercise as a low cost and beneficial activity for numerous clinical outcomes, including pain.

The second study testing exercise for pain management focused on the use of chair yoga and Reiki. Park et al. (2011) completed a quasi-experimental study in which three groups were formed: chair yoga, Reiki, or education. Participants were 29 older adults living in the community. The yoga intervention took place twice a week for 45 minutes for eight weeks. The Reiki intervention group completed a 30-minute individual weekly session for eight weeks performed by certified Reiki instructors. The education group was exposed to a group educational session for 1.5 hours every other week for eight weeks. The four sessions focused on discussions about the impact of osteoarthritis, the “drawbacks” of medication use, and options for alternative/complementary treatments. Post intervention it was noted that there was a significant decrease in pain in the chair yoga group when compared to the other two groups. As with the prior study, this work is preliminary and continued research is needed. Both studies, however, add to what is known about management of pain using behavioral interventions and provide exciting options for clinical work and research.

Behavioral Interventions to Increase Function

Nursing research over the past 15 years has addressed behavioral interventions to optimize function and physical activity among older adults. For example, several nurse researchers are using Function Focused Care approaches to optimize both function and physical activity across all levels of care (Boltz, Resnick, Capezuti, & Shabbat, In Press; Resnick et al., 2011; Resnick, Galik, Gruber-Baldini, & Zimmerman, 2011). Function Focused Care is a philosophy of care that focuses on evaluating the older adult’s underlying capability with regard to function and physical activity, and helping him or her to optimize and maintain abilities, and increase time spent in physical activity. While initially developed and implemented for older adults in nursing home settings, the 2011 studies have focused on testing and disseminating Function Focused Care approaches in acute care (Boltz, et al., In Press; Resnick, Galik, Enders, et al., 2011), assisted living (Resnick, Galik, Gruber-Baldini, et al., 2011) and home settings (Pretzer-Aboff, Galik, & Resnick, 2011). Across all settings, results of this work have consistently shown that Function Focused Care increases time spent in physical activity and improves function among those exposed.

Other nursing-led studies to increase physical activity and improve function have been done with older adults with osteoarthritis (Park, et al., 2011; Schlenk, Lias, S.M., Dunbar-Jacob, & Kwoh, 2011). The study by Park et al. (2011) used Chair yoga to manage pain and thereby improve function among older adults with osteoarthritis. Schlenk et al. (2011) tested the Staying Active with Arthritis (STAR) intervention in a volunteer sample of 26 older adults recruited from rheumatology practices. The intervention combined physical therapy and nurse led education, and resulted in: an increased use of lower extremity exercise; an increase in overall volume and intensity of exercise; and an increase in the number of minutes walked per week; an increase in the distance walked over 6 minutes; an increased in function performance such as getting up from a chair.

Interventions for Behavioral Symptoms in Persons with Dementia

Behavioral symptoms affect up to 90% of persons with dementia. When behaviors interfere with care such as bathing or oral hygiene, they place the resident at risk for more serious health problems. Suboptimal oral hygiene, for example, is among the most common risk factors for aspiration pneumonia (Quagliarello et al., 2005). Pharmacological treatments have not demonstrated strong efficacy in the management of behavioral symptoms and may have serious adverse effects in frail older nursing home residents.

An important factor in the development of interventions for behavioral symptoms is identifying and targeting the precipitating cause of the behavior. Nurse scientists have made advances in this area. Behavioral symptoms may be precipitated by pain that is not well-treated, for example. Kovach and colleagues (2006) demonstrated that the Serial Trial Intervention (STI), a five step process of assessment, evaluation and intervention using both non-pharmacological and analgesic treatments reduced discomfort and behavioral symptoms in nursing home residents with dementia. Kovach is now part of a team that is testing the STI in a Dutch population. Measures of depression and quality of life are being added as additional outcomes of the intervention (Pieper et al., 2011). The researchers are also investigating possible responder differences caused by APOE 4 status.

A number of prior studies have supported the use of leisure activities as a method for reducing boredom and subsequent behaviors. Recently Kolanowski and colleagues (2011) reported on a clinical trial in which they found that tailoring activities to residents' personality style of interest resulted in increased engagement, alertness and attention during the activity itself compared to non-tailored activities. There were also extended benefits seen for self-reported mood, anxiety, and passivity one week post-intervention when using these tailored activities. This work identified the activity components that produces the most efficacious results, allowing better precision when selecting specific activities for people with dementia.

When behaviors interfere with care poor health outcomes accrue to the individual and pose a risk of injury to caregivers and care recipient alike. In a recent pilot study, Jablonski and colleagues (2011) used threat reduction techniques combined with best oral care hygiene practices to improve oral health indicators and reduce care-resistive behaviors during mouth care to persons with moderate to late stage dementia. They found that their intervention significantly improved nurse-sensitive oral health outcomes and care-resistive behaviors compared to usual care. Jablonski's team is now testing this intervention in a large clinical trial.

Interventions for Sleep

Sleep architecture is altered by aging, cognitive impairments and disease. Medications are often prescribed for sleep disturbances, but in older adults they carry the risk for falls and cognitive disruptions, such as daytime sleepiness. Richards and colleagues (2011) report on a RCT in which they tested the effectiveness of three interventions: high intensity physical resistance strength training combined with walking (E), social activities (SA), a combination of both (ESA), vs. usual care on total nocturnal sleep time in nursing home and assisted living residents using polysomnography. Participants in the ESA group had a significant increase in total nocturnal sleep time, and greater sleep efficiency and non-rapid eye movement sleep compared to the usual care group.

There is beginning evidence to support that sleep disturbances such as obstructive sleep apnea (OSA), which occurs in 60% of older adults with MCI and dementia, might precipitate nighttime wandering and accelerate cognitive decline in persons with dementia

(Cooke et al., 2009). OSA is effectively treated with continuous positive airway pressure (CPAP) but treatment non-compliance is high. Nurse researchers are at the forefront of designing psychosocial interventions that help patients comply with CPAP treatment in an effort to improve sleep quality and slow cognitive decline (Sawyer et al., 2011). Currently, Richards is conducting a six-month double-blind randomized pilot clinical trial to compare the effects of active continuous positive airway pressure versus sham continuous positive airway pressure on cognitive and everyday function in 110 older adults with mild cognitive impairment and obstructive sleep apnea.

Interventions for End-of- Life Care

The NINR is the lead institute at NIH for end-of-life care. Nurse scientists in this field are testing bio-behavioral interventions for palliative care and symptom management across the lifespan. This past year Hickman et al. (2011) reported on their study which evaluated the Physician Orders for Life-Sustaining Treatment (POLST) program and actual treatments provided to nursing home residents of 90 nursing facilities in Oregon, Wisconsin and West Virginia. Retrospective chart data indicated that with the exception of feeding tubes and antibiotic use, residents who had POLST forms in place had their preferences honored 94% of the time.

The Future of Gerontological Nursing Research

As we look towards the future of research in non-pharmacological interventions in gerontological nursing care, there are possibilities for enriching our science through capitalizing on social developments, as well as scientific developments in other fields. For example, older American women are the fastest growing group on Facebook, Twitter, and My Space. We have vivid examples of how social networking can turn a concern into a worldwide crusade. This has created a paradigm shift in how people get information and opened up exciting possibilities for creating behavior change among even the oldest old. We need to increase our knowledge base about how social media can be used creatively and strategically to promote healthy behaviors among older adults or to change unhealthy behaviors and to promote adoption of the non-pharmacologic interventions that we know are effective.

As the science of genomics and epigenetics develops, gerontological nursing research can increase our understanding of how existing or new behavioral interventions can be targeted and individualized based on the older adult's genetics. Great potential exists for gerontological nurse scientists to hypothesize, develop, and test genotype-directed biobehavioral interventions. For example, nurse scientists might predict differential responses to dietary or exercise interventions based on genotype and also provide better understanding of the interaction between genes and the environment as we move towards personalized geriatric nursing.

Geriatric nurse scientists must also become more involved in comparative effectiveness research and implementation science. We need to better understand what works for which patients under what circumstances. We also need to compare the effectiveness of various behavioral interventions. For example, do yoga and acupuncture work better than traditional exercise or water aerobics in decreasing knee pain from osteoarthritis? We also need to develop our knowledge about how we can motivate practitioners to routinely implement non-pharmacologic interventions that have been shown to be efficacious by building on the area of implementation science. Finally to have our non-pharmacologic interventions supported through payment policies, we must better understand the cost and cost-effectiveness of these interventions.

As evidenced in the examples from our literature review, we have developed a wealth of knowledge about the efficacy of non-pharmacologic interventions. The challenge of the next generation of geriatric nurse scientists is not only to continue to develop the basic knowledge about the efficacy of additional interventions, but to also develop the knowledge base about how to individualize these interventions for their maximum treatment effect, how to target these interventions towards those with the genetics and environment who are most likely to benefit, how to design interventions that are culturally appropriate, accessible, and effective in diverse older adults, and how to get effective interventions used throughout the health care system so that they make a significant difference in the health and quality of life of the older adult population.

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