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Research productivity following nursing research initiative grants

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ABSTRACT

Background: In 1995, VA's Office of Research and Development launched the Nursing Research Initiative (NRI), to encourage nurses to apply for research funding and to increase the role of nurse investigators in the VA's research mission. This program provides novice nurse researchers the opportunity to further develop their research skills with the guidance of a mentor.

Purpose: Since the NRI's inception, its impact on the research career trajectory of budding nurse researchers had never been fully explored.

Methods: An electronic quality improvement survey was developed to collect information about the scope of work and research trajectory of VA nurse researchers undertaken since they received NRI funding.

Findings: NRI awardees demonstrated research productivity in several areas including research funding, peer-reviewed publications; participation on journal editorial boards and grant review committees; and mentorship. The majority of past NRI grant recipients (78%) have maintained employment within the VA system and benefit from the expertise, mentoring, and support of other nurse researchers. NRI grant recipients confirm the value of the VA NRI mentored grant funding mechanism and its association with a productive research trajectory with survey respondents demonstrating an average return on investment of $7.7 million in research funding per person.

Conclusion: The experiences derived from the NRI accelerated the professional growth and research productivity of this group and it guided future opportunities to design, implement, and test nurse-led interventions.

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Introduction

Among groups of interprofessional investigators, the Department of Veterans Affairs (VA) includes a network of PhD-prepared nurse researchers who are tasked with generating new knowledge, advancing the science of nursing, and improving the health and quality of life of Veterans. Although many are familiar with the National Institutes of Health (NIH) sponsored centers primarily through its well-structured website (NIH, 2017), less is known about VA research and development programs, particularly as they relate to the advancement of nursing research. This article, therefore, provides an overview of the research infrastructure within the VA, with specific attention given to the Nursing Research Initiative (NRI) which is a dedicated career development VA funding program for nurse researchers similar to the mentored "K" awards with the NIH. Results of a recent quality improvement (QI) survey evaluating the impact of NRI on the research trajectory of its past recipients are presented. This paper concludes by summarizing the importance of continued support of NRI to promote successful programs of nursing research to discover care models that will address the increasingly complex and evolving needs of Veterans.

The VA System of Care and its Research Infrastructure

The VA is the largest centralized health care system in the United States consisting of medical centers, ambulatory care and community-based outpatient clinics, Veterans centers, nursing homes, residential treatment programs, and comprehensive home-based care programs (National Center for Veterans Analysis and Statistics and VA FY16 Annual Report, 2016). VA provides care to about 8.97 million honorably discharged Veterans in the United States who meet minimum duty requirements or were discharged for a disability incurred (US Census, American Community Survey PUMS, 2014). Compared with non-Veterans, health care needs of Veterans are complex and unique. Data from the National Health Interview Survey, 2007 to 2010, found that Veterans were more likely than non-Veterans to report fair or poor health, having two or more chronic health conditions, and more work limitations (Kramarow & Pastor, 2012). Veterans were also more likely to report serious psychological distress such as post-traumatic stress disorder (PTSD) (VA FY16 Annual Report, 2016). While young Veterans are at highest risk for suicide, Veterans 50 years old or older are almost twice as likely as non-Veterans to commit suicide (Kemp & Bossarte, 2012). Eighty-two percent of Veterans from the era of Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) also report chronic pain (Johnson et al., 2013). The three major disorders reported among OEF, OIF, and OND (Operation New Dawn) Veterans were diseases of the musculoskeletal system (62.3%), symptoms, signs, and ill-defined conditions (58.7%), and mental health conditions (58.1%) (U.S. Department of Veterans Affairs 2017). Other health care issues more specific to Veterans include limb amputations, depression, PTSD, and traumatic brain injury (Olenick, Flowers, & Diaz, 2015). Thus, the unique health care needs of Veterans reinforce the necessity of building scientific evidence within its own community to drive the services it provides.

The nursing workforce comprises the largest group of health care providers within the VA and the strength in its numbers is invaluable to meeting the unique needs of the Veteran. VA Nursing Service integrates a wide array of services, encompassing patient care, clinical practice, education, research, and administration. In May 2017, there were 5,644 nurse practitioners, 63,112 registered nurses, and 15,149 licensed practical nurses employed at the VA (VA Operational Report, 2017). As of October 2016, there were 915 nurses employed in the VA with doctoral degrees; this number included 411 PhD prepared nurses (Powell-Cope et al., 2017).

In March 2017, Reuters named the VA as one of the world's most innovative research institutions (Ewalt, 2017). The VA Office of Research and Development (ORD, 2017) consists of research services in five distinct areas: biomedical laboratory, clinical science, health services, rehabilitation research, and the cooperative studies program. Biomedical laboratory research involves animal models and investigations of tissues, blood, or other human biologic specimens. Clinical science research (CSR) includes interventional and effectiveness studies, clinical, epidemiological, and technological studies. Health services research (HSR) involves issues related to health care systems, patients, informal (family) care-givers, and health outcomes. VA rehabilitation research advances the motor, sensory, and psychological recovery of Veterans in addition to measuring functional outcomes including research related to spinal cord injury and neuropathic pain, stroke and brain injury, orthopedic rehabilitation, and others. The VA Cooperative Studies Program (CSP, 2017) involves collaboration among large multicenter clinical trials and epidemiological studies that are vital to our nation's Veterans.

In addition to generating new evidence through research, the application of critical evidence into practice is supported by the VA Quality Enhancement Research

Initiative (QUERI) and the Department of Defense (DOD)/VA Joint Incentive Fund. QUERI applies innovative strategies to more rapidly implement effective treatments and other evidence-based system improvements in routine care, and evaluating the results of those efforts (QUERI, 2017). The Joint Incentive Fund provides researchers with the opportunity to address mutual areas of concern to the DOD and VA such as increased health care utilization seen among Veterans with PTSD (DOD/VA Joint Incentive Fund Guide, May 2014).

Internal Funding Opportunities in the VA for Nursing Research

In 1995, VA's ORD launched the Nursing Research Initiative (NRI), to encourage nurses to apply for research funding and to increase the role of nurse investigators in the VA's research mission. This program provides novice nurse researchers the opportunity to further develop their research skills with the guidance of a mentor. NRI funding mechanisms include the NRI pilot (1––2 years) and the NRI Investigator-Initiated Research (IIR) full grant (up to 4 years). The NRI functions much like a mentored NIH postdoctoral or faculty development "K" award. The expectation is that the NRI will facilitate the development of an independent program of research. The NRI supports nurse researchers, who are typically within 5 years of receiving their research doctorate, as they conduct research by providing funding for resources, including the assistance of mentors and statisticians.

NRI provided funding support for 61 nurse researchers during the 20-year study period with an average of 3.6 studies funded annually from a pool of 6 submissions per round. Funded nurse-led research studies have focused on a variety of healthcare issues including Alzheimer's disease and dementia, congestive heart failure, chronic obstructive pulmonary disease, smoking cessation, cancer pain management, brain injury (stroke/TBI) recovery, spinal cord injury, chronic disease management, PTSD, and quality of life. Some studies have developed caregiver models and explored ways to improve employment conditions for nurses. To meet the growing trends in alternative and complementary care, VA nurse researchers have more recently begun to explore complementary and spiritually-based interventions for Veterans.

Impact of NRI on Research Trajectory of Nurse Researchers

Since the NRI's inception in 1995, its impact on the research career trajectory of budding nurse researchers had never been fully explored. Specifically, there were no publications on scholarly outcomes (such as manuscripts, grants) and professional achievements (such as faculty appointments) by past NRI recipients after receiving their NRI funding. VA continuously employs evaluation of performance to allow for better yield of return on investment of its allocated resources thus an evaluation of this funding mechanism was needed. It was important therefore to provide evidence on how the NRI has influenced the productivity of its funded nurse researchers. Therefore, the VA Office of Nursing Services (ONS) commissioned the Nursing Research Field Advisory Committee (NRFAC) to conduct a quality improvement survey of accomplishments among past NRI recipients. The next section describes the survey methods as well is its results.

Methods

The survey in Appendix A was sent to 52 of the 61 NRI recipients with current contact information. NRI grant recipients were identified by: (1) searching the Health Services Research and Development Service (HSR&D) database for nurse researchers who received funding through NRI, and (2) obtaining information from ONS and NRFAC members. Contact information for NRI recipients who retired or no longer worked for VA was also obtained through current nurse researchers at VA. These processes generated a final list of NRI recipients. The electronic quality improvement (QI) survey was developed and tested by NRFAC members to collect information about the scope of work VA nurse researchers have undertaken since they received NRI funding. The survey was distributed by email between July and August 2016 with two follow-up emails sent to nonresponders. Although the contact information was believed to be correct for the majority, there were 24 survey nonresponders and one survey recipient had died. All the survey respondents were PhD prepared.

Measures

Each respondent was asked to provide their highest level of education including postdoctoral training, NRI grant mechanism (pilot vs. NRI IIR), and information on their research productivity, mentorship, and scholarship (e.g., peer reviewed publications and presentations) since the award. Survey information was supplemented by review of their curricula vitae (CV) emailed voluntarily by respondents. Survey respondents were also asked to describe their research career, research funding obtained prior to and after submitting their NRI proposal, attendance at grant writing workshops, and scholarly activities such as mentorship of doctoral nursing students since their NRI award. Respondents could answer questions on the survey in a way that would not identify them but the majority chose to include identifiable information by copying and pasting information from their CV or sending their entire CV by email. Respondents willingly volunteered information including grant numbers and

titles, study investigators, funding periods, total amount of NRI and other funding, and related publications. The survey was approved as a QI/operational project by the IRB at the Department of Veterans Affairs Medical Center in Salem, Virginia. Descriptive statistics were primarily used in data analysis.

Findings

A total of 28 nurse researchers responded to the survey, a response rate of 53.8% ($N = 52$). One quarter of the available sample did not provide current contact information when they retired or left VA and one VA nurse researcher died. Two respondents indicated they were retired. All survey information supplied by respondents was included. Most respondents ($n = 26$, 93%) had a PhD and 64.3% ($n = 18$) of those also completed postdoctoral training. One nurse with a BSN and another nurse with an MSN were among the first to receive NRI funding before it was available only to VA nurses with research doctorates. All the survey respondents were female. Eleven NRI survey respondents received pilot and IIR funding.

Prior to their NRI award, respondents reported they were funded by the following agencies: VA (48%, 25), NIH or other government agencies (41%, 21), nursing foundations (3.6%, 2), and universities (7.1%, 4). Respondents indicated they received funding by NRI pilot (29.6%, 8) or NRI IIR full grant (70.4%, 19) mechanisms. The NRI grant was reported to be a good fit with their area of interest and career goals by most respondents and it guided them to future opportunities to design, implement, and test nurse-led interventions. NRI recipient survey respondents ($n = 28$) served as a principal investigator on a total of 273 studies since their award with total funding reported of $167,535,623 (mean $7,777,136). Among the survey responders, 78.6% still work within VA, 82% hold an academic appointment (50% on the rank of associate professor or professor), and 68% serve on an editorial board for a journal. Respondents devote 54.3% of their time to research. Since their NRI award, respondents have disseminated their research through a total of 334 peer-reviewed research publications, 589 podium presentations, and 302 poster presentations. Moreover, NRI recipients mentored 289 doctoral students, served on 132 grant proposal review panels, and served on 202 national committees. See Table 1 for a comparison of accomplishments postaward by research awardees of HSR&D, NIH, AHRQ, and NRI (Finney et al., 2013). Note that the time reviewed for NRI recipients was 10 years longer leading to increased productivity in some areas, e.g., tenure rank.

Table 1 – Comparison of Four Career Development Award Programs.

	Awardees 2000–2010*	Awardees 2000—–2010*	Awardees 2000–2010*	Awardees 1995—–2016
Characteristic	**VA HSR&D** ($n = 219$) total mean or %	**NIH** ($n = 154$) total, mean, or %	**AHRQ** K award ($n = 69$) total, mean, or %	**NRI recipient survey** ($n = 28$, 53.8% response rate) total, mean, or %
Tenure rank	Assistant Professor	Assistant Professor	Assistant Professor	Associate Professor
One or more grants as PI	78%	76%	62%	92.8%
PI on > 1 grant of $100,000 or more	78% ($n = 107$)	86% ($n = 76$)	58% ($n = 31$)	89.3% ($n = 25$)
Total grants as PI	547	401	146	273
Mean number of grants as PI	3.2	2.9	2.7	9.75 (PI/Co-I)
Major journal articles as first or sole author	1,448	1,053	527	334
Mean number of major journal articles as first or sole author	25.3	22.8	21.6	11.9
Journal editorship/editorial board position	23%	27%	32%	68%
Grant review committee membership	10%	8%	6%	71.4%
Mean number of postgraduate mentees	6.7	5.5	7.2	10.3

*Sections included with permissions, Finney et al., 2013.

Discussion and Recommendations

NRI awardees demonstrated research productivity in several areas including research funding, peer-

reviewed publications; participation in journal editorial board and grant review committees; and mentorship. Many of these past recipients have also maintained employment within the VA system (78.6% still work within VA) which is important to note as this implies that the VA system benefits from the expertise and contribution of these nurse researchers. Additionally, this also supports the research-friendliness of the VA environment and how it can retain many nurse researchers throughout their career. Many VA nurse researchers began their research career with NRI grant funding and felt that this funding mechanism and the experiences derived from it accelerated their professional growth and research productivity. Over half of the respondents attributed their NRI and other grant funding success to attending an NIH or ONS grant writing workshop, and having a strong VA nurse mentor and intercollegial collaboration.

The results from this survey supported the importance of the NRI for beginning VA nurse researchers. The NRI structure of requiring an established mentoring relationship in its application assured the novice nurse researchers of receiving expert guidance and facilitated collaborative relationships among experienced nurse researchers. Respondents indicated the importance of selecting a mentor that fits well with their desired research interest, personality, and communication styles. Respondents also suggested the value of building relationships with potential mentors early in their career prior to grant applications so that initial role expectations are established. Importantly, although many past NRI recipients stayed at the VA for continued employment, they struggled with clear delineations of clinical versus research responsibilities. Several survey respondents continue to work in nursing roles and under administrative structures where the conduct of research is not the primary expectation and have not pursued additional research funding. VA nurse researchers indicated they are more productive in publishing when they have dedicated time as well as data entry and statistical support. It is also possible that NRI recipients were more interested in internal dissemination and application of their results within VA than sharing the information with a larger audience. To encourage doctorally prepared nurses to engage in research, ONS may need to offer recommendations on workload adjustments and performance metrics that reflect the value of research as an expectation and, at the same time, allowing dedicated time for research engagement.

Limitations

Typically, internal operational online survey response rates are between 30% and 47% (Nulty, 2008). The response rate for our survey was 53.8%. However, with any survey methodology, a major limitation includes potential for valuable information that may be missing in the portion of the sample who did not respond, which cannot be captured. Furthermore, respondents may have misinterpreted what the survey questions were asking. NRFAC members tested the survey before distribution for face validity. Survey responses are limited by self-report, ability to recall information, missing information, and attrition, however most survey respondents supplied a CV to validate their scholarly activities. It was difficult reaching survey participants as several had retired, changed their last name, or left the VA system without leaving current contact information and one NRI recipient died. Potential participants may have been limited by time constraints, reluctant to provide honest detailed answers, or may not have wanted to present themselves in an unfavorable manner so they did not complete the survey. Finney et al. (2013) reported outcomes from all recipients of VA HSR&D, NIH, and AHRQ K awards in Table 1 (100% response rate). Complete data on all NRI recipients were not collected which is a limitation to comparisons between these groups. Eleven NRI recipients (6 completed the survey) received more than one NRI award and four recipients received additional career development funding during the study time period. It is possible that survey respondents were included in more than one career development category. At last, eligibility criteria and funding amounts for each type of career development awards are different also limiting comparison. Despite these limitations, we feel the results are representative of NRI recipients and add to the body of knowledge regarding funding for VA nurse researchers.

Conclusion

The NRI was developed to provide a dedicated funding mechanism to advance nursing science. As such, the NRI is exclusive for nurses as principal investigators. The NRI embodies the relevance of mentorship by requiring a dedicated mentor for nurses in their application. This QI survey conducted among past NRI recipients demonstrated the value of NRI and its association with a productive research career trajectory.

Nurses constitute the largest workforce at the VA. Nursing care can only be effectively promoted and advanced by nurses. Thus, having dedicated resources that allow nurses to advance the science and practice of nursing cannot be underscored. With an increasing number of Veterans anticipated to receive VA health care benefits in the future, the VA should continue to invest resources to advance the science on Veteran-centric care. Through NRI, nurses are well positioned to contribute toward the development and implementation of approaches that will address the unique needs of Veterans who deserve the best care that the United States can provide.

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Appendix A. NRI Survey Questions

1. Tell us about your education. What is your highest nursing degree and what year did you receive this degree? For example, PhD, 2001.

   Do you have postdoctoral training in research? If yes, please list the mechanism, e.g., NIH, AHRQ, VA.

2. Tell us about your NRI award. Please indicate the mechanism (IIR or pilot), year, and amount of all NRI awards that you have received within the last 20 years. For example, IIR – 2006 to 2010, $999,000.

   If you have more than one NRI award, please include the details here:

3. Briefly describe your program of research and the reason you chose the NRI award mechanism over other award mechanisms (examples are HSR&D IIR, RR&D IIR, etc.) for funding.

   Prior to receiving your NRI IIR award, had you been funded as a PI in another research project within or outside the VA? (Yes, No, Not Applicable) If yes, please indicate the type of award you received, including the funding institution.

The following questions pertain to the period after you received your NRI award. (Consider sending your CV or copying and pasting from your CV).

4. Please list your VA and non-VA-funded research projects as Principal Investigator or Co-Investigator, funding agency, and an approximate amount of total funding you have received.
5. Please list your first or senior author peer-reviewed publications.
6. Please list the PhD and postdoctoral mentees with whom you are the primary mentor.

The following questions pertain to your current situation.

7. What percentage of your time is devoted to research?
8. Are you still working at the VA? If the answer is no, please share the reason you left VA.
9. Do you have an academic appointment? If yes, please indicate academic rank and year of appointment.
10. Have you served or do you serve as a reviewer for peer-reviewed journals? If yes, please indicate the number of journals that you review.
11. Have you served or do you serve as a member of an Editorial Board for a Journal?
12. How many peer-reviewed podium presentations have you completed since your NRI grant award?
13. How many peer-reviewed poster presentations have you completed since your NRI grant award?
14. Have you served or do you serve as a reviewer for grant proposals? (NIH, VA ONS, HSR&D) If yes, indicate the number.
15. Did you participate in the ONS or an NIH grant writing workshop? If yes, indicate which workshop you attended and the year you participated.
16. Do you have access to statistical support?
17. Do you have access to grant writing support?
18. Please list local and national participation in VA panel/committee memberships including IRB.
19. In one sentence, please share your recommendations on how to improve VA grant mentorship.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.outlook.2018.06.011.

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