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An evaluation of the Veterans Health Administration National Nursing Education Initiative

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ABSTRACT

Background: Since 1999, the Veterans Health Administration's (VHA) National Nursing Education Initiative (NNEI) has provided 16,294 scholarships for registered nurses to attain baccalaureate and advanced nursing degrees.

Purpose: The goal of this evaluation was to determine factors that enhanced or hindered a scholarship recipient in the completion of their degree and service obligation.

Methods: A regression analysis was performed to identify predictors of degree completion for 10,043 participants in 162 VHA facilities.

Findings: Significant predictor variables for degree completion were intended occupation, entry degree, gender, age, and year entering the program. Eighty-six percent (86.7%) of participants completed the degree requirement. Of those who completed their degree, 97% completed the service obligation.

Discussion: As recruitment and retention initiative, NNEI scholarships are poised to address the VHA nursing staffing shortages as well as build a highly qualified nursing workforce capable of providing the best care to our Nation's Veterans.

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Background

The Department of Veterans Affairs (VA), Veterans Health Administration (VHA), hereafter referred to as the VHA, is the largest employer of nurses in the United States (Dickson, 2016). The primary mission of VHA is to serve the health care needs of America's Veterans. The projected population of US Veterans is over 19 million, approximately 9.2 million of whom were served in the VA Health Care System in fiscal year (FY) 2019, and 47% of Veterans are 65 or older (National Center for Veterans Analysis and Statistics [NCVAS], 2020). Veterans often come into VHA care late in life and with high rates of comorbid

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and chronic conditions (Farmer, Hosek, & Adamson, 2016).

To achieve the VHA mission of providing timely and exceptional patient-centered care, it is essential to recruit and retain highly qualified nurses. Currently VHA employs over 100,000 total nursing staff at all education levels including registered nurses (RN), licensed practical and vocational nurses, and nursing assistants (Office of Nursing Services [ONS] Nursing Fact Sheet, 2020). Nurses in VHA fill a wide range of roles such as direct patient care across the continuum of care, mid-management, administrative, basic and applied research, and patient and academic education. "VA leads in the development of emerging roles for nurses such as transfer coordinators, Patient Aligned Care Team (PACT) care managers, community care coordinators, clinical nurse leaders, and many more" (ONS, 2017, p. 6). Registered nurses are the primary focus of nursing education and, in keeping with Institute of Medicine recommendations (2011), VHA employs over 5,000 nurse practitioners (Munro et al., 2019) and many nurses at the doctoral or nurse practitioner level (Rugs, Barrett, et al. 2020).

Still there is a need for more nurses. A recent report by the (Office of Inspector General 2019) found 73% of VHA facilities experienced a severe shortage across the system. As the largest integrated healthcare delivery system, (VHA nurse workforce challenges mirror those of the private sector 2019). To ensure a cadre of highly qualified nurses, the VA has multiple incentive programs to help individuals achieve a higher nursing degree. The array of programs range from undergraduate nursing school with the VA Learning Opportunities Residency Program (VALOR) program (for a description see Rugs, Nedd, Deitrick, & Hall, 2020) to education funding for registered nurses (Munro et al., 2019; (VHA Department of Veterans Affairs, 2020, May 2020).

Future nursing workforce needs are significant, and VHA is leveraging every available tool to support recruitment and retention of nurses. Congress authorized the employee scholarship programs to assist VHA in meeting critical healthcare staffing needs (United States Code, Title 38, Section 7671, 2019). The National Nursing Education Initiative (NNEI) is an initiative within the VA Employee Incentive Scholarship Program (EISP) that funds RNs to pursue baccalaureate and other advanced academic degrees. The NNEI awards cover tuition and related expenses such as registration, fees, and books in return for a service obligation at a VHA facility following the completion of an educational program and licensure or certification. Selections are made at the local facility with final funding approved by the Office of Workforce Management and Consulting. (VHA Workforce Management and Consulting Healthcare Talent Management, 2020). As of September 30, 2019, VA awarded 16,249 scholarships to NNEI participants since the program started in 2000.

The goal of this evaluation was to determine factors that enhanced or hindered a scholarship recipient in the completion of their degree and service obligation. To help guide this, five frameworks were identified from the literature that listed explanatory variables that predict nursing student attrition (Condon et al., 2013; Jeffreys, 2015; Metzner & Bean, 1987; O'Donnell, 2011; Raymer, 2007; Volkert, Candela, & Bernacki, 2018). Raymer (2007) modified Metzner and Bean's framework of student attrition (Metzner & Bean, 1987) to evaluate outcomes of nurses in NNEI to complete Bachelor of Science in Nursing degrees. Raymer's framework included academic variables, academic outcome, intent to leave, psychological outcomes, environmental, and background. Variables that significantly predicted degree completion were gender, number of semester hours, nontraditional program (web-based or other nonclassroom), promotion prior to completing degree unknown (reflective of utility of the degree), extended program completion date, and accelerated program completion (reflective of intent to leave). Raymer's framework was chosen to guide this project.

In addition to the variables in the available database, hospital complexity level was added to the analyses. Hospital complexity level has been a significant predictor in other VHA evaluations, for example, in implementation of a Safe Patient Handling and Mobility program to reduce nursing back injuries (Powell-Cope et al., 2014). Complexity level was found to impact the implementation of full-practice authority in VHA (Rugs et al., in press). Complexity level is calculated for each VA Medical Center and combines measures of specialty programs, intensive care units, support programs, residencies, research funding, health of population, and rurality.

Methods

The project design was a postmeasurement cohort study. Project activities were reviewed and determined to be a quality improvement project by the James A. Haley Veterans' Hospital and Clinics Research and Development Committee. Data were encrypted and stored on secure servers behind the VA firewall. No use of names or personally identifying information is in any report or publication.

Scholarship Participants

The data used in this analysis were from recipients of the 10,043 NNEI scholarship who started the program from 2000 to 2012. Most recipients were female (87.1%), 15.3% were Veterans, and the mean age was 44.2 years. The racial/ethnic distribution included 59.4% White, 22.4% Black, 6.2% Asian, and 4.0% Hispanic. Most recipients came into the program with an associate's degree (42.2%) or bachelor's degree (41.6%). Most recipients completed a bachelor's (49.8%) or master's (48.7%) level degree.

Table 1 – Characteristics of all NNEI Scholarship Participants and a Subset of Nurse Practitioner Participants

Domain/Subdomain/Variable	NNEI (*n* = 10,043) N (%)	Nurse Practitioners (*n* = 674) N (%)
Outcome variables		
Degree completed	8,710 (86.7)	582 (86.1)
Service obligation completed	8,480 (97.4)	550 (94.5)
Participant demographic characteristics		
Gender		
Female	8,747 (87.1)	586 (86.9)
Male	1,296 (12.9)	88 (13.1)
Veteran status		
Yes	1,538 (15.3)	102 (15.1)
No	8,505 (84.7)	572 (84.9)
Race/Ethnicity		
White	5,971 (59.4)	406 (60.2)
Black	2,246 (22.4)	132 (19.6)
Asian	621 (6.2)	51 (7.6)
Hispanic	405 (4.0)	29 (4.3)
Undisclosed	567 (5.7)	42 (6.2)
Other*	233 (2.3)	14 (2.1)
Average age (years)	44.2	43.6
Occupation variables		
Occupation at entry to program		
Registered nurse (RN)	9,955 (99.1)	587 (87.1)
Advanced	88 (0.9)	87 (12.9)
Occupation intended at completion of program		
Nurse practitioner	674 (6.7)	n/a
RN	9,252 (92.1)	n/a
Clinical nurse leader	117 (1.2)	n/a
Change in occupation level		
None	9,340 (93.0)	87 (12.9)
From lower to higher level nurse	703 (7.0)	587 (87.1)
Degree variables		
Degree at entry		
Associate	4,436 (44.2)	16 (2.4)
Baccalaureate	4,174 (41.6)	437 (64.5)
Graduate (Master's, Doctorate)	641 (6.4)	215 (31.8)
Other (unknown)	792 (7.9)	6 (0.9)
Degree intended at completion of program		
Baccalaureate	5,006 (49.8)	0
Graduate (Master's, Doctorate)	4,890 (48.7)	565 (83.8)
Postgraduate (e.g., Certificate)	139 (1.4)	109 (16.2)
Other (unknown)	8 (0.1)	0
Change in degree		
None	201 (2.0)	40 (5.9)
To baccalaureate	4,960 (49.4)	0
To graduate (Master's, Doctorate)	4,743 (47.2)	525 (77.9)
To postgraduate (e.g., Certificate)	139 (1.4)	109 (16.2)
Report year		
2000	1,117 (11.1)	96 (14.2)
2001	742 (7.4)	63 (9.4)
2002	763 (7.6)	50 (7.4)
2003	576 (5.7)	49 (7.3)
2004	647 (6.4)	63 (9.4)
2005	533 (5.3)	49 (7.3)
2006	485 (4.8)	61 (9.1)
2007	616 (6.1)	59 (8.8)
2008	882 (8.8)	66 (9.8)
2009	1,010 (10.1)	34 (5.0)
2010	1,248 (12.4)	37 (5.5)
2011	846 (8.4)	32 (4.8)
2012	578 (5.8)	15 (2.2)

(*continued*)

Table 1 – (*Continued*)

Domain/Subdomain/Variable	NNEI (*n* = 10,043) N (%)	Nurse Practitioners (*n* = 674) N (%)
Facility level characteristics		
Complexity		
Low (3)	1,095 (10.9)	77 (11.4)
Medium (2)	1,682 (16.8)	109 (16.2)
High (1c)	1,516 (15.1)	77 (11.4)
High (1b)	1,436 (14.3)	88 (13.1)
High (1a)	4,314 (43.0)	323 (48.0)
Average salary (thousands)	$68.5	$66.6
Average loss rate	0.078	0.078

Notes. n/a = not applicable.

* The "Other" race group includes "Multiracial or Other/Multiple Race", "American Indian/Alaska Native", and "Native Hawaiian/Other Pacific Islander."

Sampling

The analysis was limited to the years 2000 to 2012. The reason for the limitation was that the amount of time to complete both degree and service obligation could take up to 9 years.

Data Analysis

The outcome of interest for our analysis was whether a student completed the degree. We explored the association of this outcome with individual- and facility-level covariates. We employed variables that described occupation (at entry to scholarship program and intended at completion), degree (at entry and intended completion), gender, race, and veteran status. Our facility-level explanatory variables measured facility complexity, average salary, and the average loss rate.

The source of the independent variables was a database of 62 variables of application or self-reported information from participants of the NNEI scholarship program and status codes that indicated participant completion of degree and service obligation (Source: Office of Workforce Management and Consulting [WMC], Scholarships and Clinical Education database). Variables extracted for the analysis are shown in Table 1. Selection of the variables to include in the regression were chosen by discussions between WMC and the evaluation team and based on the Raymer (2007) framework.

The Facility Complexity Model is a data driven model that relies on data from VHA corporate databases along with information from VA program offices to identify workload and programs at each facility. The most recent Facility Complexity Model relies on numerous variables, including Intensive Care Unit and operative complexity level (VHA Office of Productivity, Efficiency & Staffing [OPES], 2019). The Facility Complexity Model classifies VHA facilities at levels 1a, 1b, 1c, 2, or 3, with level 1a being the most complex and level 3 being the least complex. The model is reviewed and updated with current data every three years. The facility groupings are used for various peer grouping purposes such as operational reporting, performance measurement, and research studies. The facility complexity level groupings have also been used to establish pay levels for a variety of positions such as the senior leadership teams at VHA facilities. For the current evaluation, we used the FY11 model. The distribution of facilities (*N* = 162) in our sample by complexity level, from most complex to least complex was as follows: levels 1a-highest (41 facilities), 1b-high (20), and 1c-high (34), level 2-medium (34), and level 3-low (33).

Descriptive statistics or frequencies were conducted on all variables. Two regression analyses were conducted. The first was for all NNEI scholarship recipients in the cohort. The second regression analysis focused on those recipients of scholarships for nurse practitioner (NP), with degree completion as the outcome variable. Variables used in the regressions are included in the list in Table 1.

Findings

Description of Participants

Table 1 details for each of the study variables the percentage of observations with each value. The first column reports the percentages for all NNEI students, while the second is limited to registered nurses pursuing an NP and NPs pursuing advanced degrees. Degree completion was achieved by 8,710 (86.7%) of the NNEI students and by 582 (86.1%) of the nurse practitioner group. Of those who completed their degree, 97% completed the service obligation. Of the 674 NPs, 87 (12.9%) obtained a Doctorate, 478 (71%) obtained a Masters, and 109 (16%) obtained a postgraduate certificate that did not culminate in a specific degree.

The vast majority of NNEI students (93.0%) did not intend to change occupations upon completion of the program; they planned to remain in Registered Nurse occupations. Roughly half of the students intended to earn a baccalaureate degree during the program, while nearly all of the remaining students planned to earn a graduate degree (Master's or Doctorate). Nearly all participating students were female and nonveterans, and almost two-thirds were white. Nearly 75% of all NNEI students were stationed at a high-complexity facility. Relative to all NNEI students, the nurse practitioner group generally had higher degree levels at entry and completion but otherwise was similar to non-nurse practitioners.

Table 2 presents the percentage of students who completed their degree by explanatory variable. For instance, 86.7% of all NNEI students whose entry occupation was RN completed the degree requirement. There is relatively little variation in the reported percentages across variable values. One exception is for facility complexity, where nurse practitioners stationed at facilities designated as Low and High (1c) complexity had lower rates of completing their degree but had a higher rate at Medium facilities.

Regression Analysis

The odds ratios from our regression analysis are reported in Table 3. For regressions using nominal variables, a value must be chosen as the reference case. The odds ratios are then the relative odds of the student completing the degree for that variable value, relative to the reference case. For instance, for the entry occupation level variable, "RN" is the reference value. The 1.1 value for "Advanced" implies that NNEI students who were in advanced occupations when they entered the program were 1.1 times more likely to complete their degree than students who were in RN nursing occupations when they entered the program, though not statistically different from zero.

The estimates indicate that the odds that students who were clinical nurse leaders at the end of the NNEI program would complete their degree were half as large the odds for those who were nurse practitioners. However, clinical nurse leaders were a very small proportion of the total, 1.2%. The odds for students who entered the program with baccalaureate degrees were 20% higher than those who entered the program with associate degrees. Females were significantly more likely to complete their degree. There was a negative association for completion for age, while the positive estimate for Report Year indicates that the odds of completing increased over time.

The lone highly statistically significant estimate in the regression for the nurse practitioner group is for the Medium complexity level. The odds of students completing their degree at these facilities were four times greater than the odds for students at Low complexity facilities.

Scholarship recipients that complete their degree are 97% likely to complete their service obligation. Scholarship recipients were tracked for 2-year retention at VHA employment. For this cohort 89% of the individuals who completed their service obligation were still employed by the VHA for 2 years later.

Discussion

Comparing the current results to Raymer (2007), it should be noted that Raymer used the same data set from years 2000 to 2005. In Raymer's model, employment characteristics such as years of employment, nursing level, and nursing role were included in the regression. Raymer's model also ran two separate regressions for those who completed their degree versus those that dropped out of the program. The current regression included 2 occupation variables (at entry and intended at completion) and 1 degree variable (anticipated or intended). The current regression included facility complexity, which Raymer did not use. Complexity was a significant indicator of achieving an NP degree in medium complexity facilities.

Like Raymer (2007) the current project results found a significant negative relationship with age and degree completion. Raymer (2007) and the current project found females were significantly more likely to complete their degree. Raymer (2007) found that the number of credit hours required for the degree was significantly negatively related to degree completion. The current project used intended degree completion as a proxy and found no difference between NP and RNs' likelihood to complete degree. The current study used degree at entry as a proxy to academic experience and found that those that entered the scholarship program with a baccalaureate were significantly more likely to complete their degree than those entering with an associate degree. Raymer (2007) did not include academic experience.

The high rates of degree completion, service obligation completion, and 2-year retention rate speak to the NNEI program's value for educating, training, and retaining nurses in VHA. Ninety-seven percent of scholarship recipients that complete their degree are likely to complete their service obligation with 89% likely to be working for VHA at least 2 years later. The NNEI program is a tremendous benefit for VHA. As this program has matured, the rates of completion were significantly higher per year. That the program grew more effective with each year is understandable. The development, organization, leadership, and program components take time to develop.

There was no significant effect for race. The impact of race on nursing student attrition has been well documented (Graham, Phillips, Newman, & Atz, 2016; Englund, 2019). Other demographic impacts of age and gender have been found in other studies (Raymer, 2007; Englund 2019).

One finding of note was that the medium complexity facilities were significantly more likely to graduate NPs

Table 2 – Percentage of Students Who Completed Degree by Explanatory Variable

Domain/Subdomain/Variable	NNEI (*n* = 10,043) **N (%)**	Nurse Practitioners (*n* = 674) **N (%)**
Participant demographic characteristics		
Gender		
Female	7,659 (87.6)	501 (85.5)
Male	1,051 (81.1)	80 (91.0)
Veteran status		
Yes	1,294 (84.1)	86 (84.3)
No	7,416 (87.2)	495 (86.6)
Race/Ethnicity		
White	5,171 (86.6)	350 (86.2)
Black	1,968 (87.7)	111 (84.1)
Asian	552 (88.9)	43 (84.3)
Hispanic	339 (83.7)	25 (86.2)
Undisclosed	471 (83.1)	38 (90.5)
Other*	209 (89.7)	14 (100.0)
Occupation variables		
Occupation at entry to program		
RN	8,634 (86.7)	506 (86.2)
Advanced	76 (86.4)	75 (86.2)
Occupation intended at completion of program		
Nurse practitioner	581 (86.2)	n/a
RN	8,033 (86.8)	n/a
Clinical nurse leader	96 (82.1)	n/a
Change in occupation level		
None	8,109 (86.8)	75 (86.2)
From lower to higher level nurse	601 (85.5)	506 (86.2)
Degree variables		
Degree at entry		
Associate	3,814 (86.0)	13 (81.3)
Baccalaureate	3,670 (87.9)	375 (85.8)
Graduate (Master's, Doctorate)	533 (83.2)	187 (87.0)
Other (unknown)	693 (87.5)	6 (100.0)
Degree at completion of program		
Baccalaureate	4,323 (86.4)	-
Graduate (Master's, Doctorate)	4,257 (87.1)	485 (85.8)
Postgraduate (e.g., Certificate)	123 (88.5)	96 (88.1)
Other (unknown)	7 (87.5)	-
Change in degree		
None	180 (89.6)	35 (87.5)
To Baccalaureate	4,278 (86.3)	-
To Graduate (Master's, Doctorate)	4,129 (87.1)	450 (85.7)
To Postgraduate (e.g., Certificate)	123 (88.5)	96 (88.1)
Report Year		
2000	957 (85.7)	89 (92.7)
2001	623 (84.0)	56 (88.9)
2002	624 (81.8)	44 (88.0)
2003	470 (81.6)	42 (85.7)
2004	539 (83.3)	49 (77.8)
2005	468 (87.8)	45 (91.8)
2006	428 (88.3)	52 (85.3)
2007	550 (89.3)	48 (81.4)
2008	775 (87.9)	55 (83.3)
2009	904 (89.5)	31 (91.2)
2010	1,108 (88.8)	34 (91.9)
2011	741 (87.6)	25 (78.1)
2012	523 (90.5)	11 (73.3)
Facility level characteristics		
Complexity		
Low (3)	951 (86.9)	61 (79.2)
Medium (2)	1,468 (87.3)	102 (93.6)
High (1c)	1,332 (87.9)	60 (77.9)
High (1b)	1,255 (87.4)	77 (87.5)
High (1a)	3,704 (85.9)	281 (87.0)

Note. n/a: not applicable.

-The value of the explanatory variable was not present in the sample.

* The "Other" race group includes "Multi-racial or Other/Multiple Race", "American Indian/Alaska Native", and "Native Hawaiian/Other Pacific Islander."

Table 3 – Odds Ratios for Degree Completion Based on Logistic Regression Analyses

Domain/Subdomain/Variable	NNEI (n = 10,043)	Nurse Practitioners (n = 674)
Participant demographic characteristics		
Gender		
Female	Ref	ref
Male	0.6 **	2.0
Veteran status		
Yes	Ref	ref
No	1.1	1.4
Race/Ethnicity		
White	Ref	ref
Black	1.0	0.8
Asian	1.2	0.8
Hispanic	0.8	0.9
Undisclosed	0.9	1.4
Other †	1.4	-
Age‡	0.98**	0.98
Occupation variables		
Occupation at entry to program		
RN	Ref	-
Advanced	1.1	-
Occupation intended at completion of program		
Nurse practitioner	Ref	-
RN	1.0	-
Clinical nurse leader	0.5**	-
Degree variable		
Degree at entry		
Associate	Ref	ref
Baccalaureate	1.2*	0.9
Graduate (Master's, Doctorate)	0.8	1.4
Other (unknown)	1.3*	-
Report year‡	1.06**	0.9
Facility level characteristics		
Complexity		
Low (3)	Ref	ref
Medium (2)	1.0	4.0 **
High (1c)	1.0	1.0
High (1b)	1.0	1.8
High (1a)	0.9	1.7
Average salary‡ (thousands)	1.00	1.0
Average loss rate‡	0.65	0.003

Notes.
Estimates are based on logistic regressions.
**01 significance level; * .05 significance level.
ref: reference group.
n/a: not applicable.
-: Odds ratio not calculated due to lack of variability in the variable's value.
The following domains were excluded from all regressions due to multicolinearity: Occupation Change, Completion Degree, and Degree Change.

† The "Other" race group includes "Multiracial or Other/Multiple Race", "American Indian/Alaska Native", and "Native Hawaiian/Other Pacific Islander."

‡ Age, Report Year, Average salary, and average loss rate are measured as continuous variables.

than facilities with higher or lower complexity scores. Veterans Health Administration Directive 1350, Advanced Practice Registered Nurse Full Practice Authority, implements 38 Code of Federal Regulations (C.F.R.) 17.415 granting full-practice authority (FPA) to Advance Practice RNs (VHA Department of Veterans Affairs, 2017). The facilities designated as lower or medium complexity were earlier implementors of FPA than higher complex facilities. More investigation into how medium facilities were able to accomplish higher rates of NP graduates than higher facilities is warranted. There is an extreme need for NP graduates at facilities with rural locations.

There are limitations to these findings. First, the variable types were limited by using an existing database. The variables used in other frameworks included domains such as academic experience, social and academic support, and personal characteristics like

self-efficacy (Raymer 2007; O'Donnell 2011; Condon et al., 2013; Jeffreys 2015; Volkert et al., 2018). These psychosocial variables could give more insight into why individuals were unable to finish their degree.

As is often the case, generalizing these program results to non-VHA hospital organizations is not possible. No other hospital system offers a program of this size.

Conclusions

To achieve VHA's mission, it is essential that VHA is positioned to recruit and retain a highly qualified nurse workforce. With the current and projected workforce shortages, the role of workforce recruitment and retention efforts has become a critical task for nursing leaders. As a recruitment and retention initiative, NNEI scholarships are poised to address the VHA nursing staffing shortages as well as build a highly qualified nursing workforce capable of providing the best care to our Nation's Veterans. The NNEI program has a proven track record in retaining a number of nurses at all educational levels. The authors identified a range of variables that may play a role in shaping recipients' completion of academic degrees and associated service obligations. Descriptions of factors that enhance or hinder completion of academic degrees and service obligations are rarely documented. This evaluation identified relationships between variables associated with nurse scholarship participants' completion of an academic degree. Future qualitative evaluations will be conducted to determine factors leading to higher graduation rates of NPs at selected VHA facilities to promote best practices throughout VHA.

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