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Effects of completing a postgraduate residency or fellowship program on primary care nurse practitioners' transition to practice

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ABSTRACT

Background: To prepare new graduate nurse practitioners (NPs) for transition to practice, postgraduate residency or fellowship programs have been spreading across the nation in the past decade.

Purpose: We examined the effects of completing a postgraduate residency or fellowship program on role perception, practice autonomy, team collaboration, job satisfaction, and intent to leave among primary care NPs (PCNPs).

Methods: We analyzed 8,400 PCNP respondents, representing a total of 75,963 PCNPs nationwide, to the 2018 National Sample Survey of Registered Nurses. We conducted multivariate logistic regression analyses to examine whether completing a postgraduate training program was associated with increased role perception, greater practice autonomy, improved team collaboration, increased job satisfaction, and decreased intent to leave in their work, controlling for NP personal and practice characteristics.

Results: About 10% of PCNPs completed some form of postgraduate training. Primary care NPs who had completed a residency or fellowship program were more likely to have a minority background (e.g., non-White and male) and also see more underserved populations (e.g., minority background, with limited English proficiency) than those without residency training. We found that PCNPs with residency training were more likely to report enhanced confidence in independent roles, greater practice autonomy, improved team collaboration, increased job satisfaction, and decreased intent to leave than those without residency training.

Implications for Practice: This study supports further expansion of such programs, which would have positive effects for NPs, health care organizations, and patients, necessitating a long-overdue conversation about real public funding for primary care graduate nursing education.

Keywords: Health equity; postgraduate residency or fellowship program; primary care nurse practitioners; workforce diversity.

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Introduction

Nurse practitioners (NPs) are a growing component of the primary care health workforce, with approximately 28,000 NPs entering the workforce every year (Salsberg, 2018, June 5). There is a large body of research showing that NPs deliver safe, high-quality, and cost-efficient patient care (Buerhaus, 2018, September 18; Swan et al., 2015). Like all primary care clinicians, however, NPs are facing increased patient complexity, expectations of productivity, the stress of electronic health records, and insufficient support staff. These challenges are particularly acute for new NP graduates, setting the stage for a difficult transition to their first NP position (Barnes, 2015; Brown & Olshansky, 1997; Cusson & Strange, 2008; Cusson & Viggiano, 2002; Faraz, 2019; Heitz et al., 2004; Kelly & Mathews, 2001). Novice NP transition to practice has been described as stressful and turbulent, often leads to decreased job satisfaction and increased intent to leave (De Milt et al., 2011; Faraz, 2017; Sargent & Olmedo, 2013). To address the

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difficult NP transition to practice, NP residency or fellowship programs have been spreading across the nation in the past decade (Cappiello et al., 2019; Kesten et al., 2019; Martsolf et al., 2017).

Nurse practitioner residency or fellowship programs provide postgraduate training in a supported environment. The first NP residency program was developed in 2007, and since then, the model has proliferated throughout the United States, with programs offered mostly in primary care but also in specialty settings (Cappiello et al., 2019; Kesten et al., 2019; Martsolf et al., 2017). The accrediting bodies that support achievement of the rigor and quality of NP postgraduate training programs are the National Nurse Practitioner Residency and Fellowship Training Consortium (NNPRFTC), the Commission on Collegiate Nursing Education, and the American Nurse Credentialing Center, although the majority of programs are not accredited (Kesten et al., 2019).

Nurse practitioner postgraduate training programs are typically 12 months in duration, have small cohort sizes of two to four trainees (Cappiello et al., 2019; Kesten et al., 2019; Martsolf et al., 2017), and are composed of a combination of didactic educational content, clinical supervision, peer support and debriefing, and self-reflection through journaling (Cappiello et al., 2019; Kesten et al., 2019). Content of postgraduate training programs includes fundamental skills such as use of clinical practice guidelines, history and physical examination practice, interpretation of laboratory results, diagnostic reasoning, skills training, and managing specific populations and urgent situations (Kesten et al., 2019). Other program components include communication and collaboration skills, addressing social determinants of health, electronic health record training, patient safety and quality, ethical responsibility, and billing and coding (Kesten et al., 2019). It is important to note the lack of standardization of competencies used in residency and fellowship programs, with programs using various competencies within and outside of nursing (Kesten et al., 2019). The most commonly used competencies are from the NNPRFTC and the National Organization of Nurse Practitioner Faculties in addition to institution-specific guidelines (Kesten et al., 2019).

Studies show that supporting novice NPs is critical to improving the patient experience and effectiveness and efficiency of care (Perlo et al., 2017; Sikka et al., 2015). Nurse practitioners report increased confidence and competence after completion of postgraduate training programs (Flinter, 2011; Flinter & Hart, 2017; Parkhill, 2018; Rugen et al., 2018; Zapatka et al., 2014). Additionally, researchers have found increased preparedness to practice and job satisfaction for NPs who completed these programs (Bush & Lowery, 2016; Parkhill, 2018). Finally, the majority of NP residency graduates continue practicing as primary care providers in federally qualified health centers, an encouraging outcome in a time of strained access to primary care services (Flinter, 2011; Norwick, 2016). However, there are currently no national surveys comparing outcomes between NPs who have completed a postgraduate training program and those who have not.

The purpose of this study was to explore the effect of completing an NP postgraduate training program on role perception, practice autonomy, team collaboration, job satisfaction, and intent to leave among NPs whose principal job was providing primary care. We also examined differences in practice characteristics, such as location, type of setting, and patient panel characteristics.

Methods

Data and study population

We analyzed the US Health Resources and Services Administration (HRSA)'s 2018 National Sample Survey of Registered Nurses (NSSRN). The survey was designed to provide the basis for estimating the characteristics of the nurse workforce at the state and national levels, evaluating trends and projecting the future supply of nursing resources. In particular, the 2018 NSSRN extended its focus by incorporating a questionnaire section on NPs with a representative sample of NPs. A sample of 102,520 nurses who held an active license as of December 31, 2017, were selected from a sampling frame, with 50,273 nurses completing the survey (response rate, 49%) (Health Resources and Services Administration, 2019).

Of these nurses, we identified NPs whose principal nursing position was working as an NP, providing direct patient care services with an active NP license in the 50 states and the District of Columbia. This resulted in 21,784 NPs. We restricted the sample to NPs who were actively practicing in primary care. In doing so, instead of using the field of NP education (e.g., adult medicine, family medicine, gerontology, pediatrics, or women's health), we used current field of clinical specialty, that is, the area in which they were spending most of their patient care time at the time the survey was completed. We identified 8,400 primary care NPs (PCNPs) (39% of 21,784 NPs) for this study. To yield accurate population estimates for the main parameters of interest, we adjusted the data with sampling weights (i.e., the inverse probabilities of selection for each observation) provided by the 2018 NSSRN. A weight was assigned to each eligible nurse, adjusting for the differential probabilities of selection, duplication in the sample, nonresponse, and age. Additional background information of the 2018 NSSRN data including an overview of calculating the weights are available online (Health Resources and Services Administration, 2019). The identified sample of 8,400 PCNPs represented 75,963 PCNPs nationwide. In this study, we reported weighted estimates using 75,963 PCNPs to better represent the workforce at the national level. The number of observations included in the analysis differed for each of outcome measures due to missing values, as detailed in the tables.

Measures

An NP postgraduate training program was the independent variable of interest. We created the binary variable, indicating their responses to the question, "Did you complete an NP postgraduate residency or fellowship program?"

To examine the potential benefits of completing a postgraduate training program, we selected five domains (of the 10 measures on the survey) that could serve as our outcomes of interest. These build on evidence from the literature and included role perception, practice autonomy, team collaboration, job satisfaction, and intent to leave.

We selected two categorical measures of role perception: prepared to be an independent practitioner (not at all, somewhat or very little, and a great extent) and able to practice to the full extent of your knowledge/education/training (no vs. yes). We used four binary variables measuring aspects of practice autonomy. Primary care NPs were asked, "Do you or have you ever billed under your NPI number?," "Across all NP positions you held, did you have a panel of patients that you managed, where you were the primary provider?," "Did you have hospital admitting privileges?," and "Did you have prescriptive authority?" We used two measures of team collaboration. Respondents were asked to what extent they participated in team-based care, and how confident they felt in their ability to effectively practice in interprofessional teams. Responses were recorded on a 3-point scale: "not at all," "somewhat or very little," and "a great extent." We created the four categories for overall level of satisfaction based on the question that asked how satisfied respondents were with their primary nursing position: "extremely dissatisfied," "moderately dissatisfied," "moderately satisfied," and "extremely satisfied." We created the binary variable indicating respondents' intent to leave the primary nursing position, using the question "Have you ever considered leaving the primary nursing position?"

We chose the following personal and practice characteristics as covariates: age, sex (male vs. female), race/ethnicity (White, non-Hispanic vs. other), employment setting (hospital, other inpatient setting, ambulatory clinic, and other), total earnings in 2017 from all nursing employment, and state scope of practice. We created a categorical state scope of practice variable using the location of the primary nursing position. This variable segmented our respondents into those practicing in full (i.e., full practice and prescription authority), reduced (i.e., full practice authority only), and restricted (i.e., restricted practice and prescription authority) states based on state laws governing physician involvement in treatment and diagnosis, and prescriptive authority at the time the survey was taken (Appendix Table 1, Supplemental Digital Content 1, http://links.lww.com/JAANP/A111) (American Association of Nurse Practitioners, 2020).

In addition, we analyzed a list of the questions in the 2018 NSSRN data regarding patient panel characteristics reported by a subsample of 43,365 PCNPs (57% of 75,963 PCNPs) having their own patient panel. Patient characteristics included panel size (number of patients on his/her own panel), insurance type (private, Medicare, Medicaid, TRICARE, Veterans Affairs, Indian Health Service, self-pay, and other), percent of panel in minority groups, percent of panel with limited English proficiency, and patient reimbursement type (fee for service vs. other).

Analytic approach

Our analysis was descriptive with a focus on the comparison of five domains of outcomes between PCNPs who completed a postgraduate training program and those who did not. In addition, we examined patient panel characteristics using a subsample of PCNPs having their own patient panel. We examined bivariate relationships using *t*-tests for continuous variables, and chi-square tests for categorical variables. We performed a multivariate logistic regression to examine whether completing a postgraduate training program was associated with increased role perception, greater practice autonomy, improved team collaboration, increased job satisfaction, and decreased intent to leave in their work, controlling for personal, and practice characteristics described above. For the dependent variable with a Likert-type scale in meaningful order (prepared to be an independent practitioner, participate in team-based care, feel confident to practice in interprofessional teams, and satisfaction in the primary nursing position), we conducted an ordered logistic regression. All analyses were performed and reported using weighted data to reflect the sampling design. The George Washington University Institutional Review Board waived review of this study. The data were analyzed using Stata SE 15 for Windows (Stata Corp, College Station, TX).

Results

Personal and practice characteristics

We examined descriptive personal and practice characteristics between PCNPs who completed a postgraduate residency or fellowship program (n = 7,510, 10%) and those who did not (n = 68,453, 90%). As shown in **Table 1**, we found statistically significant differences on age, sex, race/ethnicity, and total earnings in 2017 from all nursing employment. Although the study population was predominantly female (n = 69,806, 92%) and White (n = 57,022, 75%), which was consistent with the demography of nursing, PCNPs with residency training were slightly more likely to be male (12% vs. 8%; p = .02) and non-White (36% vs. 24%; p < .001) compared with PCNPs without residency training. In addition, PCNPs with residency training were older and reported more incomes than PCNPs without

Table 1. Characteristics of PCNP respondents to the 2018 NSSRN, by a postgraduate residency or fellowship program

	All PCNPs (*n* = 75,963)	PCNPs With Residency (*n* = 7,510; 10%)	PCNPs Without Residency (*n* = 68,453: 90%)	*p* Value
Age, years, mean (SD)	45 (11)	49 (11)	44 (11)	<.001
Sex, no. (%)				
Male	6,157 (8)	878 (12)	5,280 (8)	.02
Female	69,806 (92)	6,633 (88)	63,173 (92)	
Race/ethnicity, no. (%)				
White, non-Hispanic	57,022 (75)	4,817 (64)	52,204 (76)	<.001
Other	18,941 (25)	2,693 (36)	16,249 (24)	
Employment setting, no. (%)				
Hospital	9,475 (12)	892 (12)	8,583 (13)	.64
Other inpatient setting	4,392 (6)	541 (7)	3,851 (6)	
Clinic/ambulatory	57,046 (75)	5,609 (75)	51,436 (75)	
Other	5,050 (7)	468 (6)	4,582 (7)	
Total earnings, $, mean (SD)	98,630 (37,971)	106,714 (41,567)	97,743 (37,446)	<.001
Scope of practice, no. (%)				
Full	18,897 (25)	1,762 (23)	17,135 (25)	.22
Reduced	15,469 (20)	1,357 (18)	14,112 (21)	
Restricted	41,597 (55)	4,391 (58)	37,205 (54)	

The total of the percentages was not quite 100% because of rounding.
Note: NSSRN = National Sample Survey of Registered Nurses; PCNP = primary care nurse practitioner.

residency training ($p < .001$ for all comparisons). Two thirds of PCNPs were working in ambulatory clinics; however, nearly one third of NPs whose principal job was providing primary care were in hospital and other settings. The distribution across employment setting was similar for the two groups and not statistically significantly different. Among all PCNPs, 18,897 (25%) were located in full scope of practice states, 15,469 (20%) in moderately restrictive states, and 41,597 (55%) in highly restrictive states. A comparison of state scope of practice environment between the two groups was not statistically significant.

Comparison of outcome measures

In **Table 2**, we compared multiple outcomes concerning role perception, practice autonomy, team collaboration, job satisfaction, and intent to leave between the two groups. **Figure 1** presents odds ratio (OR) and 95% confidence interval (CI) from a binary or ordered logistic regression examining impacts of completing a postgraduate training program on those five domains of outcome measures. Full regression results are available in Supplemental Digital Content 1 (Appendix Table 2, http://links.lww.com/JAANP/A111).

Role perception. None of the two role perception measures were statistically significantly different between the groups. When asked about the extent to which they were prepared to be an independent practitioner, very few (1%) of PCNPs with residency training reported "not at all," whereas 34% "somewhat or very little," and 65% "a great extent." The responses were similar for PCNPs without residency training: 1% "not at all," 37% "somewhat or very little," and 63% "a great extent." A total of 6,364 PCNPs with residency training (85%) said that they were able to practice to the full extent of their knowledge/education/training, as did 55,992 PCNPs without residency training (82%).

Practice autonomy. Primary care NPs reported varying levels of autonomy across the four measures. The measure related to billing revealed that two thirds of PCNPs billed under their own national provider identifier (NPI), whereas PCNPs with residency training (*n* = 5,127, 69%) were slightly more likely to bill under their own NPI number than PCNPs without residency training (*n* = 43,215,

Table 2. Comparison of reported outcome measures, among PCNP respondents to the 2018 NSSRN, by a postgraduate residency or fellowship program

	PCNPs With Residency	PCNPs Without Residency	*p* Value
Role perception			
Prepared to be an independent practitioner (*n* = 75,963), no. (%)			
Not at all	98 (1)	494 (1)	.33
Somewhat or very little	2,531 (34)	25,060 (37)	
A great extent	4,881 (65)	42,899 (63)	
Able to practice to the full extent of your knowledge/education/training (*n* = 75,963), no. (%)			
No	1,146 (15)	12,461 (18)	.34
Yes	6,364 (85)	55,992 (82)	
Practice autonomy			
Billed under your own NPI number (*n* = 75,228), no. (%)			
No	2,356 (31)	24,530 (36)	.14
Yes	5,127 (69)	43,215 (64)	
Having own patient panel (*n* = 74,926), no. (%)			
No	2,390 (33)	29,171 (43)	<.001
Yes	4,817 (67)	38,548 (57)	
Having hospital admitting privileges (*n* = 75,963), no. (%)			
No	6,352 (85)	60,018 (88)	.07
Yes	1,158 (15)	8,435 (12)	
Having prescriptive authority (*n* = 75,963), no. (%)			
No	228 (3)	1,506 (2)	.33
Yes	7,283 (97)	66,947 (98)	
Team collaboration			
Participate in team-based care (*n* = 73,379), no. (%)			
Not at all	132 (2)	2,738 (4)	.03
Somewhat or very little	3,165 (42)	31,098 (47)	
A great extent	3,999 (55)	32,248 (49)	
Feel confident to practice in interprofessional teams (*n* = 74,050), no. (%)			
Not at all	20 (0.3)	302 (0.5)	<.001
Somewhat or very little	1,174 (16.0)	18,343 (27.5)	
A great extent	6,157 (83.8)	48,054 (72.0)	

(*continued*)

Table 2. Comparison of reported outcome measures, among PCNP respondents to the 2018 NSSRN, by a postgraduate residency or fellowship program, *continued*

	PCNPs With Residency	PCNPs Without Residency	*p* Value
Job satisfaction			
Satisfaction in the primary nursing position (*n* = 75,963), no. (%)			
Extremely dissatisfied	150 (2)	1,433 (2)	.02
Moderately dissatisfied	356 (5)	6,087 (9)	
Moderately satisfied	3,339 (44)	32,158 (47)	
Extremely satisfied	3,665 (49)	28,775 (42)	
Intent to leave			
Ever considered leaving the primary nursing position (*n* = 67,368), no. (%)			
No	3,704 (57)	27,404 (45)	<.001
Yes	2,794 (43)	33,466 (55)	

The number of observations included in the analysis differed for each of outcome measures due to missing values, as detailed in the table. The total of the percentages was not quite 100% because of rounding.
Note: NSSRN = National Sample Survey of Registered Nurses; NPI = national provider identifier; PCNP = primary care nurse practitioner; .

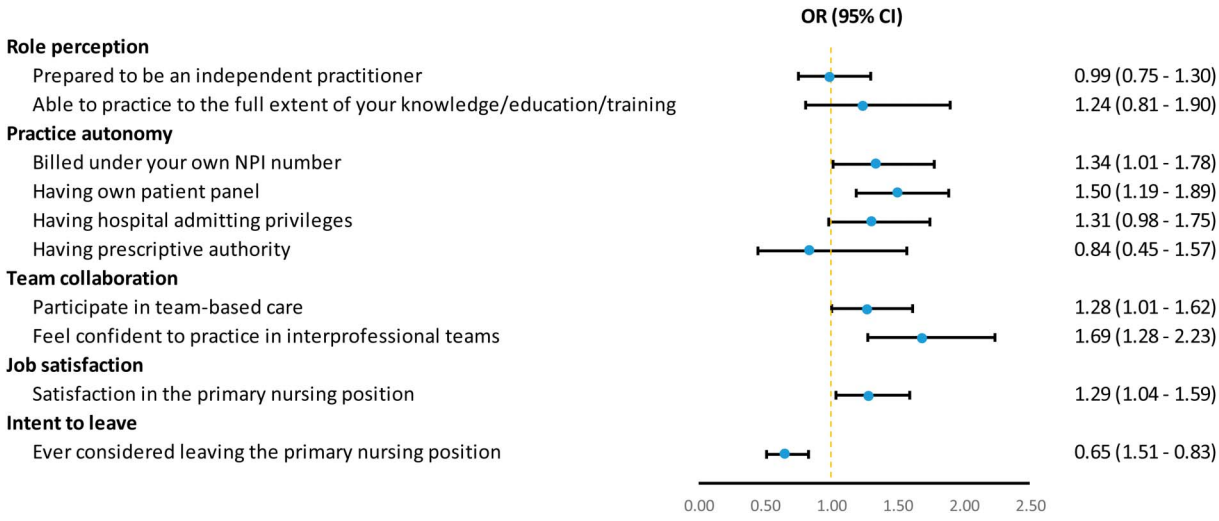

Figure 1. Odds ratios and 95% confidence intervals from binary or ordered logistic regression models examining impacts of completing an NP postgraduate residency or fellowship program on reported outcome measures. The regression controlled for the following personal and practice characteristics: age, sex (male vs. female), race/ethnicity (White, non-Hispanic vs. other), employment setting (hospital, other inpatient setting, ambulatory clinic, and other), total earnings in 2017 from all nursing employment, and state scope of practice (full, reduced, or restricted). CI = confidence interval; NP = nurse practitioner; NPI = national provider identifier.

64%). The difference between the two groups was not statistically significant in the bivariate analysis (p = .14); however, after controlling for personal and practice characteristics, it became marginally significant, in that, PCNPs with residency training had higher odds of billing under their own NPI number than those without residency training (OR = 1.34; 95% CI, 1.01–1.78; p = .04). Primary care NPs with residency training were more likely to have their own patient panel than those without residency training: 4,817 (67%) versus 38,548 (57%) (p < .001). Consistent with the bivariate analysis, the multivariate regression exhibited a strong, positive association

between residency training and having own patient panel. Primary care NPs with residency training were 1.50 times more likely to have their own patient panel than those without residency training (95% CI, 1.19–1.89; p < .001). There were no statistically significant associations between residency training and having hospital admitting privileges or prescriptive authority in both bivariate and multivariate analyses.

Team collaboration. The distribution of participation in team-based care was statistically significantly different between the groups (p = .03). The majority of PCNPs with residency training reported that they participated in team-based care (55% "a great extent," and 42% "somewhat or very little," while only 2% "not at all.") Among those without residency training, 49% reported "a great extent," 47% "somewhat or very little," and 4% "not at all." Primary care NPs with residency training felt more confident practicing in interprofessional teams "to a great extent" than those without residency training (83.8% vs. 72.0%; p < .001). Completing postgraduate training was consistently positively associated with participating in team-based care (OR = 1.28; 95% CI, 1.01–1.62; p = .04) and feeling confident to practice in interprofessional teams (OR = 1.69; 95% CI, 1.28–2.23; p < .001), after controlling for personal and practice characteristics.

Job satisfaction. The majority of PCNPs in both groups reported being satisfied with their primary nursing position (93% of PCNPs with residency training vs. 89% PCNPs without residency training; p = .02). Forty-nine percent of PCNPs with residency training reported that they were extremely satisfied with their primary nursing position, significantly more than those without residency training (42%). Primary care NPs with residency training had higher odds of being satisfied with their primary nursing position than those without residency training (OR = 1.29; 95% CI, 1.04–1.59; p = .02).

Intent to leave. A total of 3,704 PCNPs with residency training (57%) reported that they had never considered leaving their primary nursing position, whereas 27,404 PCNPs without residency training (45%) had (p < .001). In the multivariate regression analysis, PCNPs with residency training were 0.65 times less likely to leave their primary nursing position (95% CI, 1.51–0.83; p < .001).

Patient panel characteristics

We examined descriptive patient panel characteristics using a subsample of 43,365 PCNPs who reported having own patient panel, separating PCNPs who completed a postgraduate residency or fellowship program (n = 4,817, 11%) and those who did not (n = 38,548, 89%) (**Table 3**). Primary care NPs with residency training reported more patients in their own panel than those without residency training. The mean number of panel size for PCNPs with residency training was 697 (SD = 816), whereas the value for PCNPs without residency training was 583 (SD = 721) (p = .04). Additionally, PCNPs with residency training were likely to have higher percent of patient panel in minority groups (47 percent vs. 42 percent; p = .02) and with limited English proficiency (29 percent vs. 18 percent; p = .05) compared with PCNPs without residency training. There were no statistically differences on patient insurance and reimbursement type.

Discussion

Although the potential benefits of postgraduate training is widely acknowledged, most previous research is based on single case studies or programs. To the best of our knowledge, this is the first study to compare outcomes in NPs with residency training versus those without residency training, using a nationally representative sample of NPs. We found that approximately 10% of PCNPs completed some form of postgraduate training beyond initial education. Our findings have important implications for health equity, in that PCNPs with residency training were more likely to have a minority background (e.g., non-White and male) and also see more underserved populations (e.g., minority background, with limited English proficiency). Consistent with prior studies, we found positive outcomes concerning role perception, practice autonomy, team collaboration, job satisfaction, and intent to leave.

The findings of this study have implications for employers, educators, and policymakers as they seek to prepare new graduate NPs for transition to practice in primary care. First, our results reinforce prior research that points to the benefits of providing NP postgraduate training programs to organizations. We found that NP postgraduate training appears to help build confidence and mastery of the role of independent primary care provider. Employers in the context of community health centers view confidence and mastery of the independent clinician role as keys to productivity (Pittman et al., 2020). Similarly, NPs with residency training are more likely to participate in team-based care. We know that team-based care improves utilization and care quality, especially among the sickest patients in primary care (Meyers et al., 2019). Our results are also consistent with prior research demonstrating improved recruitment and retention of new graduate NPs in primary care. This also has immediate financial implications for all employers concerned about the high cost of turnover but is especially important from an equity perspective for health care organizations having difficulty recruiting new primary care clinicians in rural and underserved communities.

As the demand for complex primary care increases, transition-to-practice NP residencies appear to be a way to maximize the impact of this rapidly expanding workforce. However, the NP residency is still in the early stages, and standards to ensure quality, as well as enhanced funding streams, will be needed for their expansion. A

Table 3. Patient panel characteristics of PCNP respondents to the 2018 NSSRN, by a postgraduate residency or fellowship program

	PCNPs With Residency (*n* = 4,817; 11%)	PCNPs Without Residency (*n* = 38,548; 89%)	*p* Value
No. of patients, mean (SD)	697 (816)	583 (721)	.04
Percent of insurance type, mean (SD)			
Private	26 (25)	28 (26)	.19
Medicare	23 (23)	24 (24)	.51
Medicaid	28 (28)	29 (27)	.66
TRICARE	5 (16)	3 (10)	.14
Veterans affairs	5 (19)	4 (17)	.37
Indian health service	1 (7)	1 (6)	.35
Self-pay	10 (18)	9 (18)	.62
Other	2 (13)	2 (13)	.70
Percent of panel in minority groups, mean (SD)	47 (31)	42 (30)	.02
Percent of panel with limited English proficiency, mean (SD)	23 (29)	18 (25)	.05
Patient reimbursement, no. (%)			
Fee-for-service	1,723 (36)	15,112 (39)	.28
Other	3,094 (63)	23,436 (61)	

Findings were from a subsample of 43,365 PCNPs who reported having own patient panel. The total of the percentages was not quite 100% because of rounding.
Note: NSSRN = National Sample Survey of Registered Nurses; PCNP = primary care nurse practitioner.

study showed that of 41 NP residency programs, only 26% of programs were accredited and that programs were not consistently based on nationally recognized competencies (Kesten et al., 2019). Clearly, the next phase would benefit from a mandatory standardized accreditation process. Nurse practitioners have historically played a vital role in providing primary care in rural and underserved areas, suggesting that a special responsibility of these NP residencies is to support the achievement of competency in addressing social determinants of health.

Equally important is the financially sustainability of these residencies. More than $18 billion public dollars are invested annually in graduate medical education (GME) by Medicare, Medicaid, Veterans Administration, and the HRSA Teaching Health Center program (Chen et al., 2019). Unlike GME, participation in postgraduate NP training is not required. Although the National Academy of Medicine has recommended establishing ways to develop and finance nursing residency programs, to date, the public funding has been very small (National Academies of Sciences, 2016). The main public funding currently available is a three-year program (2020–2023) called the Advanced Nursing Education Nurse Practitioner Residency Integration Program (Health Resources and Services Administration, 2020). Administered by HRSA, the program has $5 million dollars available for approximately five grants each year to fund programs in community-based settings. According to a recent survey of 41 programs, nearly half of the programs received no source of funding, and only 10% of programs received funding from their own institutions (15%), Veterans Administration (10%), and Medicare/Medicaid (4.9%) (Kesten & El-Banna, 2020). Thus, any effort to expand NP residencies must consider additional public funding streams.

This study has several limitations. Most notably, the study was cross sectional, making causal conclusions impossible. Second, we were unable to control for differences among programs (e.g., specialty area, curriculum, etc.). Third, self-reported outcomes are always subject to possible recall and reporting bias. Outcomes were limited to measures reported in the NSSRN, and these outcomes are unlikely to reflect the full potential impacts of programs. Particularly, impacts on patient outcomes and effectiveness and efficiency of care are critical and should be explored in future studies.

Despite these limitations, our study suggests that completing residency training was associated with important health equity factors, including increased diversity in the NP workforce itself, and service to minority and underserved communities. Findings also reinforce prior research on enhanced confidence in independent roles, greater practice autonomy, improved team collaboration, increased job satisfaction, and decreased intent to leave in their work. This supports further expansion of such programs, which would have positive effects for NPs, health care organizations and patients, necessitating a long-overdue conversation about real public funding for primary care graduate nursing education.

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