

Outcomes of postgraduate fellowships and residencies for nurse practitioners: An integrative review

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ABSTRACT

Background: In 2011, the Institute of Medicine published a report on the future of nursing, which recommended nurse practitioner postgraduate training in the form of fellowships or residencies. Since then, the number of postgraduate programs has grown, but data is still scarce regarding their efficacy and benefits.

Aim: The goal of this integrative review is to synthesize available literature regarding the outcomes of nurse practitioner postgraduate fellowships and/or residencies on clinical competence and perceived readiness to practice.

Methods: CINAHL, PubMed, and citation searching were used to search relevant subject headings, MeSH headings, and keywords related to fellowships and residencies for nurse practitioners, resulting in 11 articles being included based on inclusion and exclusion criteria. Synthesis was completed using the Garrard Matrix method to identify common themes among the studies.

Results: Eight quasi-experimental and three cross-sectional studies were included in this review. Programs included multiple areas of focus, including primary care, critical care, and pediatric acute care. Common themes among the studies were an increased level of preparedness, reduced turnover, and greater job satisfaction.

Conclusions: The major theme found among the studies was an increased confidence and preparedness to practice. Minor themes include increased job satisfaction and decreased intent to quit.

Introduction

A recently updated report from the Association of American Medical Colleges projects a shortage of up to 124,000 physicians by the year 2033 (Reynolds et al., 2021). Nurse practitioners have been an invaluable part of helping to close this gap, but there is a growing body of evidence that new-graduate nurse practitioners experience significant anxiety and stress during their first year of practice (Klein et al., 2021). Furthermore, despite the movement towards team-based medicine, physicians and nurse practitioners alike often see nurse practitioners as unprepared upon transitioning from the RN to APRN role (Eaton et al., 2019; Hart & Bowen, 2016), especially when compared to their Physician Associate counterparts (Donelan et al., 2020; Phillips et al., 2018).

Background

In 2022, there were over 385,000 licensed and practicing nurse practitioners in the United States, a stark increase from the 290,000 NPs practicing in 2020 (NP Fact Sheet, 2024; American Association of Nurse

Practitioners, 2021). Since the advent of the nurse practitioner role in 1965, the profession has expanded to include 12 different certifications across five certifying bodies, providing care for all age groups (American Association of Nurse Practitioners, n.d.). While the majority of these nurse practitioners work in primary care, the number of non-primary care nurse practitioners is expected to continue to grow (National Center for Health Workforce Analysis, 2014; NP Fact Sheet, 2024).

Nurse practitioner students are required to complete a minimum of 500 supervised hours of clinical time before being eligible to sit for their certification test. However, a National Organization of Nurse Practitioner Faculties (NONPF) report published in 2022 titled Quality Nurse Practitioner Education recommended, among other things, increasing the minimum number of clinical hours to a total of 750 h of direct patient care before being eligible to sit for their certification test (NONPF, 2022). This increase in hours has been met with pushback from organizations such as the National League for Nursing (NLN) and has yet to be adopted by the Commission of Collegiate Nursing Education (CCNE) (Keaton, 2022; Mason, 2024). Additionally, a study completed by Fulton et al. found that students only spend an average of 38 % of their clinical

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time in direct patient care (2017). The remainder of that time is spent on various tasks, the majority of which tend to be charting and staffing their patients with preceptors (Fulton et al., 2017). And while arguments have been made in the past that support previous RN experience as an adjunct to NP clinical hours, a study of factors that affect the new nurse practitioner's transition into practice found that previous experience as a registered nurse had no significant impact on the new NP's transition (Barnes, 2015).

In 2008, the National Academy of Medicine (formerly the Institute of Medicine) published a report in response to the expansion of medical coverage in the US, in an effort to evaluate and make recommendations regarding the role that the nursing profession can play in this increase in demand. One such recommendation was for the creation of postgraduate residencies for nurse practitioners, intended to ease the transition from the RN-to-NP role or into a new clinical area (Institute of Medicine [IOM], 2011). The report was updated in 2011, but the recommendations for nurse practitioner residencies remained the same.

The idea of postgraduate training for nurse practitioners is nothing new: in 2007, the Community Health Center in Connecticut created the first NP postgraduate training program for primary care nurse practitioners (Flinter & Bamrick, 2017). Since then, over 88 programs have been created, some identifying as residencies and others as fellowships, with the name being a matter of choice of the program and not status of the participant. While most programs are focused on primary care providers, there has been a push towards creating more programs for other specialties (Grabenkort et al., 2017; Kesten & El-Banna, 2020; Martsof et al., 2017). While there are limited studies regarding the outcomes of those programs, the available data shows positive outcomes among nurse practitioners upon completion of the programs. However, the measured outcomes lack standardization. There has been little in the way of data to evaluate the efficacy and outcomes following implementation of these programs.

The purpose of this study was to synthesize all available research studies regarding nurse practitioner fellowship or residencies since their creation in 2007, summarize the outcomes measured, and uncover gaps for areas of future research.

Methods

Design

Whittemore and Knafl (2005) describe an integrative review as a method that permits a reviewer to evaluate both experimental and non-experimental studies as a means to thoroughly gather information to address a problem at hand. As much of the data available regarding outcomes of programs within a hospital setting are non-experimental or quasi-experimental, the Whittemore and Knafl integrative review framework was used to ensure validity in this paper.

Search and retrieval strategies

Using the PRISMA guidelines to enhance rigor of the search and retrieval process, a comprehensive search for relevant literature was completed using CINAHL and PubMed with the assistance of a librarian (Page et al., 2021). Keywords searched included combinations of *nurse practitioner or advanced practice nurse or APN or NP, postgraduate or residency or fellowship or internship*. To further narrow the results of the search and capture studies focused on outcomes of fellowships and articles, the keywords *outcomes* and *preparedness or readiness or preparation* and *transition* were added to the search. MeSH headings in PubMed and subject headings in CINAHL were also used to enhance the search for literature within the databases. A reverse citation search was also completed to limit search bias. A research session with a skilled health sciences library also aided in this literature search.

Inclusion/exclusion criteria

Nurse practitioner fellowships and residencies were first created in the United States in 2007. Thus, the search was limited for studies published from 2007 to present. Results were further limited by only including studies that were peer-reviewed, related to programs in the United States, and those published in English. Studies were included if they reported on nurse practitioner fellowships or residencies with mention of outcomes following completion of the program and were not limited to one specific specialty or population, with the exception of studies involving psychiatric nurse practitioner residencies or fellowships. This was due to the uniqueness of that specialty, the differences in clinical experiences, and the potential inability to generalize findings to strictly medicine focused fields. To control for differences in education, clinical experiences, and curriculum regarding outcomes, only studies that reported on nurse practitioners were included, and those that reported on both physician associates and nurse practitioners were excluded. Additional exclusion criteria include studies reporting on orientation or transition to practice programs and studies that reported creation and implementation of fellowships or residencies without reporting on outcomes.

Quality appraisal

Whitmore and Knafl recommend critical appraisal of primary sources of data to examine quality of the studies included in a systematic review (2005). The scope of this review did not limit articles based on quantitative or qualitative results and included both quasi-experimental and cross-sectional studies. The Joanna Briggs Institute (JBI) Critical Appraisal Tools were chosen for this review given the specificity for the types of studies (Moola et al., 2020; Tufanaru et al., 2020).

Those studies that were quasi-experimental in nature were appraised using the JBI Checklist for Quasi-Experimental Studies and those that were cross-sectional were appraised using the JBI Checklist for Analytical Cross-Sectional Studies (Moola et al., 2020; Tufanaru et al., 2020). In each of these tools, the studies were evaluated in a number of categories, with a possible answer of yes, no, unclear, or not applicable for each. For the quasi-experimental checklist, there were a total of 9 categories, while the cross-sectional checklist contained 8 categories. Each study was evaluated using the appropriate checklist and scored on whether they included the specific criteria listed. If the study included criteria listed in the category, one point was given, whereas no points were given if it did not include the criteria listed. If it was unclear or not applicable, that category was removed from the checklist to prevent skewing the results. After completing the checklist, the points were totaled against the number of categories included and are then presented as a percentage of categories met rounded to the nearest whole number. Thus, a maximum score of 100 % is possible for either checklist.

Data analysis and synthesis methods

The nature of the research surrounding the outcomes of postgraduate fellowship and residency training is largely mixed methods, quasi-experimental, or cross-sectional. Utilizing the Garrard Matrix Method, data from the included studies were inserted into a review matrix to compare methodology, sample sizes, target population, themes, and findings to aid in the extraction of themes and synthesis of results (Garrard, 2022).

Results

The searches completed in PubMed and CINAHL resulted in a total of 137 studies and 111 studies, respectively (Fig. 1). Of those results, 30 studies were identified as duplicates and removed, and the abstracts of the remaining articles were reviewed to evaluate if they met criteria for inclusion. In total, 202 articles were excluded after review after failing

PRISMA 2020 flow diagram for new systematic reviews which included searches of databases, registers and other sources

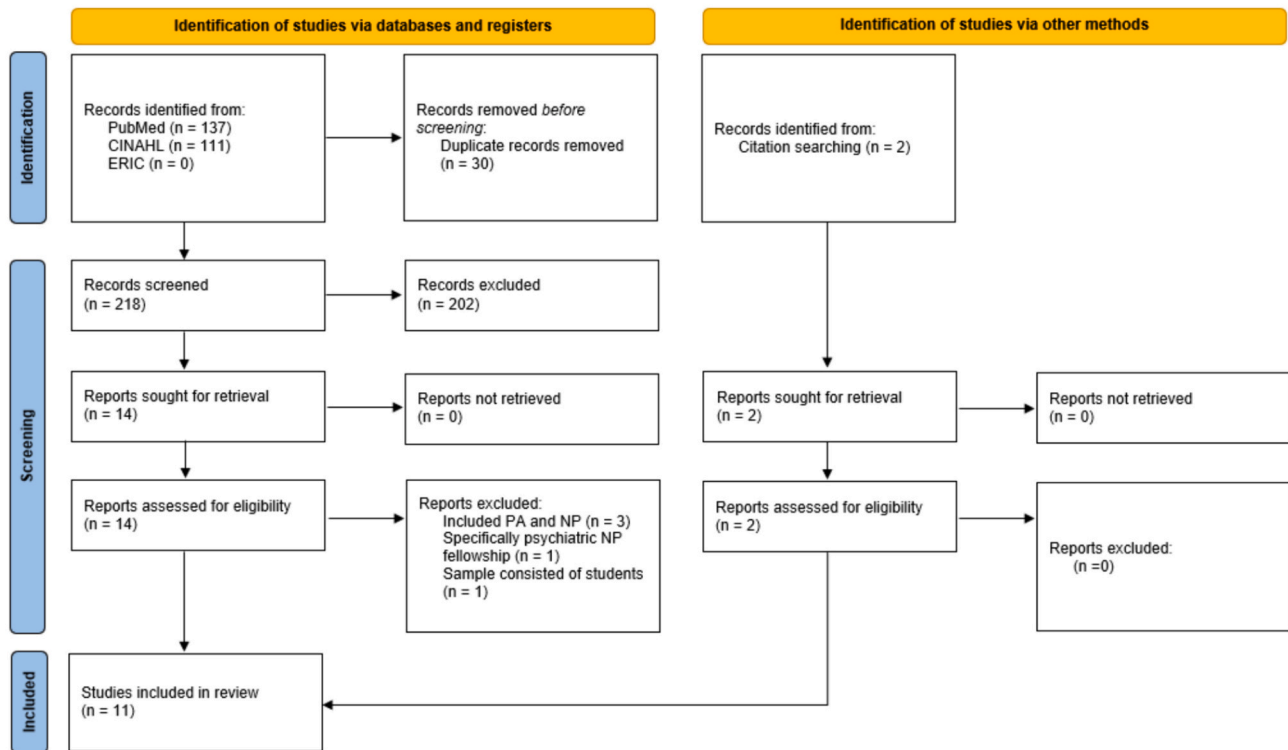


Fig. 1. PRISMA 2020 flow diagram.

Note. Obtained from Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372:n71. doi: <https://doi.org/10.1136/bmj.n71>. For more information, visit: <http://www.prisma-statement.org/>.

to meet inclusion criteria listed above. The remaining 12 articles were evaluated, three were excluded for including physician associates in the sample and one was excluded for the sample consisting of nurse practitioner students. Another study that was retrieved was specifically about a postgraduate fellowship of psychiatric nurse practitioners and was excluded. After final review, nine articles were found via database search. Reverse searching of a recently published article on transition to practice programs resulted in an additional two studies that fit inclusion criteria but did not appear during the initial search, bringing the total number of studies included in this review to 11 (Table 1).

Critical appraisal

Results of the quality appraisal on each study are shown in Table 1. The quasi-experimental studies ranged from a score of 60 % to 100 % (Cartwright, 2021; Comola & Hande, 2021; Flinter & Hart, 2016; Rugen, Dolansky, et al., 2018; Rugen, Harada, et al., 2018; Schofield & McComiskey, 2015; Stojadinovic et al., 2019; Thabault et al., 2015). Four studies required exclusion of at least one category in the critical appraisal checklist due to a lack of clarity in that category (Cartwright, 2021; Flinter & Hart, 2016; Schofield & McComiskey, 2015; Stojadinovic et al., 2019). The three studies that were cross-sectional scored 86 % to 100 % (Bryant & Parker, 2020; Bush & Lowery, 2016; Park et al., 2021).

General study characteristics

Study design

Quasi-experimental studies comprised seven of the 11 articles, pre-and-post-intervention measurements of a single cohort of fellows or residents (Comola & Hande, 2021; Flinter & Hart, 2016; Rugen, Dolansky, et al., 2018; Rugen, Harada, et al., 2018; Schofield & McComiskey, 2015; Stojadinovic et al., 2019; Thabault et al., 2015). An eight

quasi-experimental study did not utilize pre-and-post intervention measurements, instead comparing retention of those that completed the postgraduate training program compared to hospital data of retention of newly graduated nurse practitioners hired in years passed (Cartwright, 2021). Cartwright also reported the mean job satisfaction for nurse practitioners after completing the postgraduate training program but did not compare this data to any other data or subjects (2021). The remaining three studies were cross-sectional analyses using convenience samples or information from databases to evaluate the efficacy of NP programs (Bryant & Parker, 2020; Park et al., 2021) or job satisfaction and retention (Bush & Lowery, 2016).

Length of program

The eight quasi-experimental articles measured outcomes directly related to their own programs, and therefore provided details specific to their program. All but one of those eight studies reported a program length of 12 months from start to finish (Cartwright, 2021; Comola & Hande, 2021; Flinter & Hart, 2016; Rugen, Dolansky, et al., 2018; Rugen, Harada, et al., 2018; Stojadinovic et al., 2019; Thabault et al., 2015), the other being nine months in length (Schofield & McComiskey, 2015). However, one those programs reported that the residents found the 12 months to be too long and opted to shorten the residency to six months moving forward (Thabault et al., 2015). The remaining three articles were either cross-sectional surveys that reported varying lengths of programs or did not report the length of the program at all (Bryant & Parker, 2020; Bush & Lowery, 2016; Park et al., 2021).

Demographics

All but two articles included in this review reported some demographic data regarding the fellows or residents accepted into their program. Age ranges varied from 18 to 65 years of age (n = 1), 25–30 years of age (n = 5), 25–40 years of age (n = 1), 30–39 years of age (n = 1), and a mean age of 45 years of age (n = 1). Those that reported gender

Table 1
Summary of studies, design, and outcomes

| Author | Year | Purpose | Design | Sample size, population | Method/measures | Findings | Major limitations | Critical appraisal score |
|--------------------------|------|---|--------------------|--|---|--|--|--------------------------|
| Thabault et al. | 2015 | Implement and evaluate residency for new graduate NPs | Quasi-experimental | n = 8, New graduates, primary care retail setting | Eight newly graduated nurse practitioners were admitted to a newly developed residency program for retail primary care. Retention was specific outcome measured. | Does not explicitly mention clinical outcomes but does report no turnover at 6 months. Subjective and non-qualitative satisfaction from the residents | The only quantitative measure was retention at 6 months. Anecdotal responses were reported, but no formal presentation of qualitative feedback was included. | 78 % |
| Schofield and McComiskey | 2015 | Design, implement, and measure outcomes of Critical Care Fellowship | Quasi-experimental | n = 6, new graduate NPs, critical care setting. | Pre- and post-program assessments were completed to evaluate management and procedural competence using Likert scale | Increase in overall preparedness from 2 (little experience) to 3 (competent) in all cohorts. Procedural competence increased from 0 to 4 (fully competent) in all groups. Simulation results improved from 1 (1 critical action demonstrated) to 4 (all critical actions demonstrated) | No statistical method reported, no mention if improvement in pre-intervention to post-intervention scores were statistically significant. | 80 % |
| Cartwright | 2021 | Evaluate the effect of a fellowship program on job satisfaction and retention | Quasi-experimental | n = 9, New graduate NPs, two FNPs, one neonatal NP, and six with unmentioned specialties in a midwestern children's hospital | Convenience sample of all fellows admitted into a total of two cohorts. The Misener Nurse Practitioner Satisfaction Scale was administered to assess for job satisfaction, and retention data was collected at the end of the program and compared to the previous 3 years' worth of retention within 365 days of hire. | Participants of the NP fellowship program reported a mean score of at least "satisfied" in areas of professional, social, and community interaction, professional growth, and benefit. Retention rates were 100 % one year after hire for those that completed the program, compared to the previous three years in which retention ranged from 88.47 % to 95.84 %. | No comparison group for MNPSS data, limiting interpretability of the results. Retention of program participants compared to the previous three years is not analyzed for statistical significance. | 60 % |
| Flinter and Hart | 2017 | Evaluate common themes among graduates of the first NP residency program created in the United States | Quasi-experimental | New NPs and one NP with one year experience; working in primary care at a Federally Qualified Health Center | 24 residents completed reflective journals throughout the course of their program, which were then evaluated by the researchers to identify common themes among the residents in relation to their transition from RN to NP | Major themes were identified by month, starting with a state of excitement in the first month, quickly transitioning to overwhelming and fluctuating confidence over the next 2 months. Over the course of the residency, the NPs identified exhaustion and feelings of inadequacy, followed by perceptions of growth, increased awareness in their role, and comfort with increased workload. Overall, reflective growth in confidence. | Journals submitted to the researchers were not anonymous, possibly resulting in embellished reporting. | 85 % |
| Rugen, Dolansky, et al. | 2018 | Evaluate NP competencies after completing postgraduate fellowship | Quasi-experimental | New graduate NPs, primary care setting | NP residents completed competency forms pre-and-post? | Statistically significant improvement in all domains measured, both via self-reporting and as observed by preceptors. At month 1, residents scored themselves less than 3 in domains measuring clinical competence, leadership, and performance improvement/population | Small sample size, risk for bias and variability among mentors completing surveys. No standardized training for mentors, so students may have received different levels of support over the course of the program. | 88 % |

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Table 1 (continued)

| Author | Year | Purpose | Design | Sample size, population | Method/measures | Findings | Major limitations | Critical appraisal score |
|-----------------------|------|---|---------------------------------|---|--|---|--|--------------------------|
| Rugen, Harada, et al. | 2018 | Evaluate perceptions of competency throughout residency | Quasi-experimental: time series | New graduate NPs, Primary Care setting | NPs completed surveys over the course of their one-year training | Residents' self-reported strengths progressed over the course of the program, with initial strengths being limited to patient centered care and basic clinical skills, which includes history taking and basic exams. Clinical competency was reported as an area for improvement. By the end of the program, residents reported proficiency in complex clinical skills such as diagnostic skills, chronic disease management, and targeted/focused interviews. At the end of the program, areas for desired improvement shifted from clinical skills to leadership and quality improvement projects. | Qualitative responses were not blinded from the researchers, possibly causing bias in responses. Subjective | 88 % |
| Bryant and Parker | 2019 | Evaluate the effects of an NP fellowship on confidence, job satisfaction, and retention | Cross-sectional | Unspecified if strictly new NPs or mixed with experienced, transitioning NPs. | 49 NPs that completed postgraduate fellowship and 209 NPs that did not answer survey to assess their readiness to practice as well as current state of practice using the Likert scale and MNPJSS. | Results found statistically significant difference only in areas of perceived value, compensation, and bonuses. Otherwise, there were only trends in high scores among those that completed survey, but no statistically significant difference | Limited sample size led to low statistical power. 30 % of the respondents were familiar with the researcher, possibly causing bias. | 86 % |
| Stojadinovic et al. | 2019 | Implementation and outcomes of pediatric ACNP fellowship | Quasi-experimental | Pilot study with one NP fellow accepted into program | Multiple evaluations over the course of the yearlong program. Evaluations included competency-based evaluations and self-reflection. | Over the course of the first 6 months, the fellow was able to manage 4–5 patients, and took on full assignment before the completion of the program. Reported improvement in her clinical skills, time management, and prioritization. The fellow reported being able to easily transition into her first full-time career after completing the fellowship with minimal onboarding time. | Only one sample with no comparisons available. Competencies reported as improved, though no quantitative or qualitative evidence provided. Anecdotal evidence. | 80 % |
| Bush & Lowery | 2021 | Evaluate effects of nurse practitioner postgraduate education on job satisfaction | Cross-sectional survey | NPs that completed a postgraduate training program lasting at least one | Nonequivalent group study design with convenience sample. Programs of at least one year in length with | Nurse practitioners that completed postgraduate training reported statistically significantly higher job satisfaction | Cross-sectional, unable to measure causation. Due to design, researchers were unable to determine | 100 % |

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Table 1 (continued)

| Author | Year | Purpose | Design | Sample size, population | Method/measures | Findings | Major limitations | Critical appraisal score |
|------------------|------|---|------------------------|---|---|--|---|--------------------------|
| | | | | year (<i>n</i> = 80) compared to those that did not (<i>n</i> = 174) | contact information available for program directors were sent a survey requesting it be forwarded to former participants. Comparison group was obtained via advertisement on the ENP network. | compared to those that did not complete a program, particularly in the areas of collegiality, autonomy, interaction, and growth. Additional analysis reported additional factors that significantly affect satisfaction, including years of experience between completion and the survey as well as state regulatory environments. | response rates from each program, risking selection bias. The comparison group was recruited via a professional network, risking selection bias. | |
| Park et al. | 2021 | Examine effects of residency or fellowships on role perception, autonomy, satisfaction, and intent to leave | Cross-sectional survey | Primary care NPs, regardless of postgraduate training. | Analyzed results of national RN survey, restricting results to those of primary care NPs to evaluate effects of postgraduate training | NPs that completed a fellowship were statistically more likely to have increased independence in practice (their own panel of patients), participate in team-based care, and feel confident in practicing in interprofessional teams. They were also had increased job satisfaction with decreased intent to leave in their current role. There was also a marginal significance in billing under individual NPI when controlling for practice settings. It was also noted that NPs that completed fellowships earned more money in comparison to their non-fellowship counterparts. | Cross-sectional, unable to measure causation. | 88 % |
| Comola and Hande | 2021 | Evaluate productivity following completion of urology fellowship | Quasi-experimental | One new NP enrolled in a 12-month fellowship and three NPs that did not complete a fellowship | Productivity at 12 months after hire was compared between the fellow and three other NPs that did not complete fellowship. | The study found that the NP that completed the fellowship was operating at a 93 % Template Utilization Rate, compared to the other NPs, who were operating at rates of 75 %, 57 %, and 86 %. The authors do state that the fellow was seeing patients of lower complexity based on their RVU:Patient visit ratio, but do not expound further on that. | Very limited <i>n</i> . Only one sample in the intervention group and 3 in control group. One member of the control group worked in a different setting than the other three nurse practitioners. | 100 % |

(*n* = 8) were predominantly female, ranging from 66 % female to 100 % female. Four studies also reported on race and ethnicity, with Caucasian being the majority in all four studies.

Outcomes measured

Preparedness

One of the most common themes mentioned in the studies was either the measured or perceived increase in preparedness via clinical competence and confidence in professional practice. Of the 11 studies examined, seven reported higher levels of preparedness via self-assessment or reflection from the fellows or residents upon completing the program (Bryant & Parker, 2020; Flinter & Hart, 2016; Park et al.,

2021; Rugen, Dolansky, et al., 2018; Rugen, Harada, et al., 2018; Schofield & McComiskey, 2015; Stojadinovic et al., 2019). Of those seven studies, three also included feedback from mentors or preceptors that reported a perceived improvement in clinical competence (Bryant & Parker, 2020; Rugen, Dolansky, et al., 2018; Schofield & McComiskey, 2015; Stojadinovic et al., 2019).

Only one study further evaluated clinical competence using simulations, scoring fellows on a scale of zero to four, where zero indicated no critical actions demonstrated in the simulation and four indicated that all critical actions were demonstrated (Schofield & McComiskey, 2015). Pre-intervention simulation scores indicated a mean score of one, indicating only one critical action taken during the scenario. Post-intervention simulation scores increased to a mean score of four for

each scenario following the completion of the fellowship.

Bryant & Parker, however, reported no statistically significant improvement in preparedness to practice in the setting of improved clinical competence or confidence following the completion of a fellowship program (2020). It was noted by the authors, though, that this may be due to very low statistical power due to a small sample size.

Job satisfaction and retention

Job satisfaction in those that completed a fellowship or residency was assessed by only four studies (Bryant & Parker, 2020; Bush & Lowery, 2016; Cartwright, 2021; Park et al., 2021). Cartwright (2021), Bryant and Parker (2020) and Bush and Lowery (2016) all evaluated NP satisfaction using the Meisner Nurse Practitioner Job Satisfaction Score (MNPJSS), while Park et al. (2021) analyzed the results of a nationwide survey that included reports on satisfaction and intent to leave. In three of the four studies, there were statistically significant differences in job satisfaction between those that completed a fellowship and those that did not (Bryant & Parker, 2020; Bush & Lowery, 2016; Park et al., 2021). No comparison group for job satisfaction was included in the fourth study (Cartwright, 2021). Park et al. (2021) were able to extrapolate the data further, reporting statistically significant differences in the level of satisfaction between those that completed postgraduate training and those that did not. Specifically, 49 % of NPs that finished a residency or fellowship were extremely satisfied in their current role, compared to the 42 % of those nurse practitioner that did not complete postgraduate training. Park et al. also evaluated the intent to leave in both groups, finding that 55 % of those who did not complete a postgraduate program considered leaving their role in primary care, whereas only 43 % of those with postgraduate training had considered the same. Bush and Lowery (2016) also reported a statistically significant difference in job satisfaction between those that completed postgraduate training and those that did not, though only when additional variables were considered, such as years of experience on the job and level of regulatory autonomy. While Cartwright (2021) did not have a comparison group for job satisfaction, retention data from the hospital prior to implementing the mandatory postgraduate training program was utilized as a comparison group, though statistical analysis was not performed to measure for statistical significance.

Productivity

Only one study included in this review primarily measured productivity as an outcome of completing a specialized fellowship (Comola & Hande, 2021). In the study, productivity was measured by comparing the actual patient visits with overall schedule availability for each NP, with 100 % productivity indicating every available office visit slot being filled by a patient seen. Productivity was examined at one year from date-of-hire for three NPs that did not complete a fellowship and one NP that did complete a fellowship. The NP that completed the fellowship was noted to have a productivity of 94.3 % in comparison to the other three NPs, whose productivity ranged from 56.9 % to 86.1 %. It was noted, however, that the NP who completed the fellowship was seemingly seeing lower complexity patients in comparison to the other NPs based on the RVU to patient ratio.

Discussion

The results of this review suggest that participation in a postgraduate fellowship or residency program may be associated with improved job satisfaction, improved clinical confidence, and higher job retention. The literature suggests that new nurse practitioners value the formalized postgraduate programs, and that there are measurable positive outcomes with their implementation. To date, no published review has evaluated the outcomes that these programs have on nurse practitioners as they undergo their role transition. While literature reviews have recently been published assessing postgraduate training programs, they have limited their analysis to similarities in program design or have

included programs like formal orientation as a transition to practice (Kesten & El-Banna, 2020; Sciacca & Reville, 2016; Speight et al., 2019).

The most common theme within the studies was a perceived increased preparedness to practice and increased clinical confidence, which is expected. It has been said that it takes up to 10,000 h of deliberate practice to obtain a level of expertise in a particular skill, and while that number may be debated, there is no denying that increased practice in a supportive, supervised environment will improve overall outcomes (Anders Ericsson, 2008). Additionally, advanced procedures, including diagnostic skills, are often seen as an area of weakness for new graduate nurse practitioners (Hart & Bowen, 2016). Postgraduate training programs provide additional time and resources for new and transitioning nurse practitioners to further develop their skills that either are not or cannot be taught within the academic setting, while being done in a controlled, structured manner (Schallmo et al., 2019).

Another important observation from this review is that participants who have completed postgraduate training programs often report increased job satisfaction and decreased intent to quit compared to those who have not. Estimates of advanced practice provider turnover, to include physician associates, range between 8 %–12 % (Hoff et al., 2019) With the cost of onboarding a new nurse practitioner or physician associate estimated to range between \$84,000 and \$300,000 per employee, this can result in hundreds of thousands, if not millions, of dollars of lost expenses and revenue per year for a facility (Gilliland, 2019; Dean Martin, 2020; Morgan et al., 2020). Reasons for leaving a company during one's first year varies, but common themes are lack of clinical confidence, transition shock, and lack of independence (Hughes et al., 2021; Mounayar & Cox, 2021). Postgraduate training programs may be able to help mitigate these problems by offering increased support during early phases of a new hire's transition, reducing transition shock and improving independence through mentoring and clinical guidance.

Though the results presented in this review suggest positive outcomes from completing a postgraduate program, there is still much work to be done to fully understand the true impact that these programs have on clinical competency, patient outcomes, and budgetary impact, as well as how these programs are received by hospital administration. The most recent data regarding the costs of turnover was published by Morgan et al. in 2020, though the estimated cost provided was from only one facility. A nationwide survey of the costs of turnover across several facilities stratified by size and funding can help gauge the cost-benefit of a postgraduate training program in the long run, as many of these programs are solely funded by the institution itself and without federal (MacKay et al., 2018). Additionally, more research needs to be done to evaluate the impact that postgraduate training programs can have on retention, as only three studies in this review reported such data.

This review also redemonstrates the previously reported lack of consistency among measured outcomes in studies of postgraduate training. Many of the studies evaluated for this review reported different outcomes as a measurement of success of the program, including perceived readiness to practice, productivity, retention, and salary. While these outcomes all support postgraduate training, there still seems to be no consensus on what is valued as areas for positive impact.

Finally, nearly all studies reported a small sample size as a limitation of their study. This is often due to the limited number of postgraduate training slots available at each facility due to limited resources and funding (Goodwin et al., 2021). A multicentered approach to evaluate nurse practitioner fellows and nurse practitioner residents in similar settings in different facilities could arguably increase the reliability of the data supporting these programs. The impact of these programs on other specialties and certifications must also be further investigated, as the majority of the data available reports on Family Nurse Practitioners in primary care settings.

Limitations

One of the most significant limitations of this review is that, given the design of the studies performed on postgraduate training programs, one can only show association between postgraduate training programs and the identified outcomes, and not a cause-effect relationship. The limited size of the programs, as well as a general lack of funding, prohibits a more controlled and comparative study design to see if these outcomes are truly as a result of participation with their program and simply because the participants have been working for any length of time.

This review is also limited by the questionable generalizability of the findings, given the multiple settings in which these studies took place. A Family Nurse Practitioner's education is different than an Adult-Gerontology Acute Care Nurse Practitioner's education and could therefore be subject to different stressors and preparedness upon graduation. Furthermore, the setting in which the nurse practitioner is employed may mirror their academic curriculum more closely than others. For example, a Family Nurse Practitioner working in primary care at an academic medical center may be better prepared for practice upon graduation than a Family Nurse Practitioner working in a rural Federally Qualified Health Center (Flinter, 2011). It may be difficult to support the completion of a postgraduate program on the basis of improved clinical proficiency when one particular certification is more prepared for a certain clinical setting than another.

Additionally, there is a lack of consistency in metrics evaluated in each study. While seven of the studies report a perceived increased preparedness to practice following completion of a postgraduate program, the remainder of the themes are only mentioned by one to three studies, each with a small sample size. Furthermore, the programs themselves varied in structure, length, and overall design. Without more rigorous standards, replication, or a larger sample size, it is difficult to say if these results are anomalies or not.

The strength of this review, however, is that all studies showed some measurable positive outcome from completing a postgraduate program, regardless of certification or specialization. Though it is difficult to generalize these results, this review shows the promise that completing a postgraduate training program leads to positive outcomes and favorable response from fellows and residents.

Implications

Postgraduate training programs provide a unique opportunity for universities and nursing faculty to continue to support their students during the delicate transition period from classroom to clinical practice. To date, the recommended increase in direct patient care hours by the NTF has yet to be adopted by credentialing bodies and will likely require additional time and resources for graduate programs to implement the new recommendations. Nurse practitioner faculty can take this time to help to increase the visibility of nurse practitioner fellowships and residencies and inform their students of the potential benefits. Universities and clinical sites may also see benefit in working together to create a streamlined program in which nurse practitioner students complete a DNP with some or all required clinical hours in a more structured residency-type program. One example of this in practice is the Johns Hopkins Supporting Nursing Advanced Practice Transition (SNAPT) Fellowship. Participants accepted into this fellowship spend the final five months of their DNP program completing their rotations at a site that agrees to take on the student as a fellow upon graduation, followed by a 12-month, compensated program focused on mentorship, skill building, didactics, and care conferences (*Supporting Nursing Advanced Practice Transitions (SNAPT) Fellowship*, n.d.). Following completion of the fellowship, graduates are trained to become NP preceptors, thereby building an educated pool of potential preceptors and mentors for future students and fellows.

Conclusion

Postgraduate training for nurse practitioners provides a structured environment to give new and transitioning providers the support needed to alleviate some of the stressors associated with role transition. This additional support may have positive impacts on job satisfaction, decreased turnover, and has the potential to increase productivity through improved preparedness for practice. While there is still much research needed to evaluate the benefits of a postgraduate training program, the results of this review provide valuable insight into the possible benefits for both new nurse practitioners and those transitioning to new areas of specialization. Future research should be aimed at evaluating the benefit of nurse practitioner residencies and fellowships on a larger scale and measuring outcomes related to transitioning to practice and preparedness, as well as the financial implications and impact on turnover.

CRedit authorship contribution statement

Kevin E. McDonough: Conceptualization, Formal analysis, Writing – original draft, Writing – review & editing.

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