

The growing need to provide training in clinical procedures in family nurse practitioner educational programs

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ABSTRACT

Family nurse practitioners (FNPs) have a plethora of employment options upon graduation. Besides primary care, many are working in nontraditional settings such as urgent care, emergency departments, retail health, and specialty practices. In many of these settings, practitioners are required to perform procedures. However, more information is needed on the type of settings in which recent FNP graduates are working, the procedures being performed in these settings, and the perceptions of graduates of how prepared they felt to perform these procedures. Family nurse practitioners who completed an FNP program within the previous five years and who attended the 2019 AANP National Conference were invited to participate in a survey to assess their preparation in clinical procedures. Results revealed that more than half of the 198 respondents reported doing incision and drainage of abscesses and laceration repair. Respondents were divided on how they first learned to perform the procedures, with 47% stating that a preceptor demonstrated procedures to them during a clinical practicum experience, 42% stating that they learned on the job after graduation, and 43% reported that their FNP program provided training or simulation activities related to procedures. More than a quarter of respondents reported that they took a class on procedures. In all, 61% reported that they did not feel adequately prepared to perform procedures on graduation. Results indicated that colleges of nursing should ensure that FNP students have opportunities to master the procedures that are frequently performed by FNPs.

Keywords: Curriculum; family nurse practitioner; nurse practitioner education; nurse practitioner skills; preparedness.

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Introduction

One of the aims of nurse practitioner (NP) education is to prepare graduates for the work they will be doing in their future employment. Nurse practitioners are fortunate to have a range of employment opportunities. The 2012 Health Resources and Services Administration national sample survey of nurse practitioners, a survey of nearly 13,000 randomly selected licensed NPs, reported that, although 76% of respondents were certified in a primary care specialty (family, adult, pediatrics, or gerontology), only 48% of respondents were working in a primary care office or facility. Thirteen percent were working in an internal medicine subspecialty, 8.8% in a surgical subspecialty, and 20% listed their specialty as “other” (U.S. Department of Health and Human Services, 2014). Family nurse practitioners (FNPs)/across the lifespan have perhaps the

widest range of employment options of all NPs, from retail health and urgent care to federally qualified health centers to a myriad of internal medicine subspecialties.

A challenge for NP programs has been to adapt to changes in the health care system. For example, diseases that were once managed exclusively in the acute care setting (e.g., asthma exacerbation, pneumonia) are now routinely managed in outpatient settings. Retail clinics treat conditions typically seen in family practice offices, whereas urgent care settings provide care formally delivered in emergency departments. Primary care providers manage chronic conditions previously referred to specialty care (e.g., HIV, insulin management). With FNPs practicing in all these settings (and more), FNP educators and leaders must be vigilant to ensure the educational model keeps up with the rapid changes in health care. Even Doctorate of Nursing Practice (DNP) programs, with an enhanced clinical hour requirement, may not be adequately preparing NPs for clinical practice (Martsolf & Sochalski, 2019).

Background Procedures

Many NPs now work in settings that require them to perform procedures. Lausten (2012), in a survey of 436

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Oregonian NPs (70% of whom were FNPs), found that 71.6% performed abscess incision and drainage, 57.5% perform skin closure (sutures), 53.7% interpret chest X-rays, and 64.8% interpret electrocardiograms (ECGs). However, only 19.2% of respondents reported that they learned abscess incision and drainage in their NP program. The percentage of respondents who reported learning skin closure (sutures), interpretation of chest X-rays, and ECG interpretation in their NP program were 46.9, 45.5, and 43.7, respectively. Furthermore, Lausten asked respondents about the importance of performing abscess incision and drainage to NP practice: 42.6% responded "very important" and 24.7% responded "important." For ECG interpretation, the results were 56.0% very important and 24.7% important. In total, 56.8% thought that learning chest X-ray interpretation was "very important" and 20.3% thought it was "important."

Scheibmeir et al., (2015) compared the amount of time spent in NP programs versus physician assistant (PA) programs on procedural skills and diagnostic and laboratory tests. Surveys were sent to 297 NP programs, of which 106 responded. Some of the skills listed in the questionnaire included X-ray interpretation, ECG interpretation, and suturing. In total, 20.9% of the NP programs spent 1–2 hours on X-ray interpretation, whereas 41.9% of NP programs spent 3–4 hours on this skill. By comparison, of 125 PA programs surveyed, 85.1% reported spending more than 6 hours on X-ray interpretation. As for ECG interpretation, the NP programs spent 1–2 hours (24.8%) or 3–4 hours (41.9%) compared with PA programs, 91.4% of which spent more than 6 hours on this skill. Similar differences were seen with suturing: NP programs reported spending 1–2 hours (13.4%) or 3–4 hours (47.1%), whereas 60.8% of PA programs spent more than 6 hours on this skill.

Coldiron and Ratnarathorn (2014) examined data from the 2012 Medicare Physician/Supplier Procedure Summary Master File for CPT codes that were billed independently by NPs or PAs. They found that "destruction of premalignant lesions, 2–14," was billed over 422,000 times by NPs in 2012, whereas complex uroflowmetry was billed more than 7,400 times by NPs in 2012. Langston et al., (2017) has noted a large increase in urologic procedures billed to Medicare by Advanced Practice Providers (APPs) between 1994 and 2012. Although this category of providers includes both NPs and PAs, clearly the number of NPs performing advanced urologic procedures has experienced a large increase in the last two decades. "Between 1994 and 2012, annual Medicare claims for urologic procedures by APPs increased dramatically. Cystoscopy increased from 24 to 1820 (+7,483%), transrectal prostate biopsy from 17 to 834 (+4,806%), complex Foley catheter placement from 471 to 2,929 (+522%), urodynamics testing from 41 to 9,358 (+22,727%), and renal ultrasound from 18 to 4,500 (+24,900%)."

Kleinpell et al., (2006) surveyed acute care nurse practitioner (ACNP) programs to determine the specific skills taught in ACNP programs and to assess the level of importance ACNP educators placed on the teaching of the specific skills. Of the 56 ACNP program responses, 100% taught 12-lead ECG interpretation, 98% taught chest X-ray interpretation, 89% taught suturing, and 41% taught superficial abscess incision and drainage. Furthermore, the survey asked ACNP program directors to rank the importance of teaching particular skills to ACNP students. Skills were ranked on a 5-point scale, with 5 being the highest and 1 the lowest score. Twelve-lead ECG interpretation was ranked high (5) by 44 of 56 respondents, whereas suturing was ranked 5 by 33 of the 56 respondents. Chest X-ray interpretation was ranked 5 by 42 respondents and 4 by seven respondents.

Preparation for practice

Hart and Macnee (2007) completed a landmark survey of 563 NPs (61% FNPs). Thirteen percent of the respondents stated they were "generally or well prepared" after completing their basic NP education in suturing, 8% in X-ray interpretation and 6% in simple office procedures. A similar study of 698 NPs (69.4% FNPs) was performed in 2016 (Hart & Bowen, 2016). In this study, a 5-point scale was used to gauge preparedness on graduation with a range from 1 (very unprepared) to 5 (very prepared). Diagnostic tests and dermatologic procedures received the lowest scores: ECG interpretation: 2.60, simple office procedures: 2.46, suturing: 2.38, and X-ray interpretation: 2.20.

There has not been a study published specifically on the procedures performed by FNPs or procedures taught in FNP programs. The purpose of this survey was threefold: 1) To determine the clinical practice setting in which recently graduated FNPs were employed, 2) Identify clinical procedures FNPs are expected to perform in their employment setting, and 3) Identify how FNPs are trained to do the procedures they are required to perform in their clinic setting.

Methods

After receiving Institutional Review Board approval, a convenience sample of FNPs was recruited from attendees at the American Association of Nurse Practitioners National 2019 conference in Indianapolis, Indiana. Inclusion criteria included graduation from an accredited FNP program within the previous 5 years, current FNP certification, English as a primary language, and current employment as an FNP.

The primary investigators were seated at a conference table near the conference's exhibit hall. A sign was posted at the table inviting FNPs who had graduated in the past five years to complete a survey. Passersby were invited to participate if they met the inclusion/exclusion criteria.

After obtaining informed consent, respondents were provided an iPad with the survey questions or had the survey texted to them for completion later in the day.

Results

One hundred ninety-eight FNP's completed the survey. The majority of respondents reported that they work in a clinic, either hospital-based ($n = 58$), private practice ($n = 56$), or a Federally Qualified Health Center ($n = 29$). Sixty-two responded that they work either in urgent care/emergency room fast track ($n = 37$), emergency department ($n = 11$), or retail health ($n = 14$; **Table 1**).

A large number of respondents reported performing dermatologic-related procedures. Incision and drainage of abscesses is performed by 125 (63.1%), whereas laceration repair, either by suturing, stapling, or gluing, is performed by 110 (55.5%). Regarding other dermatologic procedures, 66 (33%) provide skin biopsies and 76 (38%) perform skin tag/mole removal.

As for women's health procedures, of the 198 respondents, 116 (58.6%) reported performing Papanicolaou testing, 30 (15.1%) perform intrauterine device insertions and 43 (21.7%) insert or remove contraception implants such as Nexplanon. Sixty-nine (34.8%) respondents reported that they do not perform any women's health procedures. Eighteen (9%) of the 198 respondents provide prenatal care to their patients.

Family nurse practitioners perform many diagnostic tests. Our survey found that the most frequently performed diagnostic tests are ECG interpretation (70%),

X-ray interpretation (43.6%), and pulmonary function test/spirometry (24.3%; **Table 2**).

As for where the FNP's learned to perform the procedures, 94 (47%) reported that their preceptor demonstrated the procedures during clinic practicum experiences and 83 (42%) learned on the job after graduation. Fifty-seven (29%) FNP's stated that they took a course after graduation and 85 (43%) stated that their FNP program provided training/simulation opportunities (**Table 3**).

More than half of the respondents, 121 (61%), reported that they did not feel adequately prepared to perform procedures within the scope of an FNP on graduation (**Table 4**). The vast majority of respondents, 189 (95.5%), stated that FNP programs should be required to provide training and practice opportunities for performing clinical procedures (**Table 5**).

Discussion

To protect the public from harm, NPs need to be able to safely and adequately perform procedures required in the setting in which they are working. The public assumes that the providers they see in any health care setting are adequately prepared to perform the procedure their condition requires. Our survey provides a snapshot of the procedures that FNP's perform and the lack of uniformity of procedure training in schools providing FNP education. A requirement for completion of a NP program at the masters level is the attainment of 500 clinical hours. However, programs that educate students to care for multiple age groups, such as Family/Across the Lifespan NPs, are expected to have more than 500 hours of clinical time, although an exact number is not specified (National Task Force on Quality Nurse Practitioner Education, 2016). For a DNP degree, 1,000 direct care hours of clinical practice postbaccalaureate is required (American Association of Colleges of Nursing (AACN), 2006). The National Task Force on Quality NP education (2016) states that clinical hours are to be distributed to support the development of competencies that are congruent with the needs of the population. This mention of competencies provides a segway to the trend in nursing education toward competency-based education, and possibly away from the time-based requirement in the future.

Competency-based education has slowly gained momentum in advanced practice registered nursing education arena in the past two decades. The National Organization of Nurse Practitioner Faculties (NONPF) 2013 DNP NP Toolkit uses the following definition of competencies: "knowledge, skills, and abilities that are necessary to care for the public's well-being in varying states of health" (NONPF Curricular Leadership Committee, 2013). In 2002, NONPF, in partnership with AACN published Nurse Practitioner Primary Care

Table 1. Where do you provide care? Choose all that apply

	Total	Percent
Hospital-based clinic	58	29.2
Private practice clinic	56	28.2
Urgent care/ER fast track	37	18.7
Hospital/hospitalist	31	15.6
Federally qualified health center	29	14.6
Other	25	12.6
Retail clinic	14	7.1
Emergency department	11	5.5
Long-term care/assisted living	8	4.0
Veterans administration hospital or clinic	4	2.0
Active duty military	4	2.0
Telemedicine	4	2.0
Mobile van	2	1.0

Table 2. Procedures and diagnostic tests performed by family nurse practitioners

	Total (N = 198)	Percent
Acute/urgent care procedures		
Abscess incision/drainage	125	63.1
Laceration repair (suturing/ stapling/gluing)	110	55.5
Foreign body removal	97	49.0
Limb immobilization (casting/ splinting)	75	37.8
Slit lamp/fluorescein staining	72	36.4
Toenail removal	58	29.3
Woods lamp	58	29.3
None	45	22.7
Peak flow assessment	43	21.7
Other	15	7.6
Bedside ultrasound	12	6.0
Dermatology procedures		
None	109	55.0
Skin tag/mole removal	76	38.4
Skin biopsy (punch/shave)	66	33.3
Other	7	3.5
Aesthetic (botox, fillers)	3	1.5
Laser procedures	2	1.0
Women's health procedures		
Papanicolaou test	116	58.6
None	69	34.8
Contraception implant insertion/ removal	43	21.7
Intrauterine device insertion	30	15.1
Prenatal care	18	9.1
Endometrial biopsy	12	6.0
Colposcopy	4	2.0
Dilation/curettage or pregnancy termination	0	0
Diagnostic tests		
ECG interpretation	138	70.0
X-ray interpretation	86	43.6
PFT/spirometry	48	24.3
None	36	18.3
Ultrasounds	23	11.7

Table 2. Procedures and diagnostic tests performed by family nurse practitioners, continued

	Total (N = 198)	Percent
Continuous glucose monitoring	16	8.1
Cardiac stress tests	8	4.1
Tonometry	8	4.1
Other	8	4.1
Fetal monitoring	7	3.5
Insulin pump downloads	4	2.5
Pacemaker interrogations	1	0.5

Competencies in Specialty Areas: Adult, Family, Gerontological, Pediatric, and Women's Health. This contained a structured list of competencies for adult, family, gerontological, pediatric, and women's health nurse practitioners. This document contained the recommendation: "Performs primary care procedures, including, but not limited to, suturing, minor lesion removal, splinting, microscopy, and pap tests" (NONPF, 2002). In 2012, the NONPF published the Nurse Practitioner Core Competencies, which delineated nine core competencies for all nurse practitioners. These broad competencies were for all NPs, regardless of population focus. It did not mention procedures, but it did state that an NP: "Employs screening and diagnostic strategies in the development and diagnoses" (NONPF, 2012). Population-Focused Nurse Practitioner Competencies, including Family/Across the Lifespan NP competencies were published in 2013. This document expands on the prior document when it comes to procedures. Its curriculum content to support competencies states "Performance of common office procedures which may include, but are not limited to, suturing, lesion removal, incision and drainage, casting/splinting, microscopy, and gynecology procedures." However, the document clearly states that this curriculum content is "neither required nor comprehensive, this list reflects only suggested content specific to the population (NONPF, 2013). The 2017 AACN Common Advanced Practice Registered Nurse Doctoral-Level Competencies document does not mention procedures (AACN, 2017).

A more recent construct for health care educators is entrustable professional activities (EPAs). Entrustable professional activities are units of professional practice. They are measurable and observable. They are "a means to translate competencies into clinical practice" (ten Cate, 2013). Stemming from medical education, they are beginning to be developed for advanced practice nursing education. According to Surjadi et al., (2019), "the concept

Table 3. How did you FIRST learn how to perform clinical procedures (within the FNP scope of practice, such as suturing or biopsies)? Choose all that apply

	Total (N = 198)	Percent
My preceptor demonstrated procedures to me during my clinical practicum experiences	94	47.4
I learned on the job after graduation	83	41.9
My FNP program provided training/ simulation opportunities	85	42.9
I took a course after graduation	57	28.8
I do not perform any procedures in my position	22	11.1

Note: FNP = family nurse practitioner.

of entrustability implies that the learner can adequately and safely perform a clinical task without clinical preceptor supervision.” Bargagliotti and Davenport (2017) state that “in advanced nursing practice, an EPA is any professional skill that requires education, practice, and initial supervision to insure the student’s safe clinical performance of the skill.” Mastery of a skill such as suturing occurs in a stepwise fashion. The first step is a didactic component, attaining the knowledge necessary to determine the type of anesthesia, suture material, and suturing method to use. Next might be observation of the procedure. This would be followed by use of a task trainer. Final steps are supervised practice, then minimal supervision, with the preceptor nearby, followed finally by independent practice.

Our survey results were similar to the 2004 and 2016 NP preparedness surveys cited above. Family nurse practitioners continue to report a lack of preparedness on graduation to perform common office procedures. Colleges of nursing that graduate FNPs should include

Table 4. On graduation, did you feel adequately prepared to perform clinical procedures within the scope of an FNP?

	Total (N = 198)	Percent
Yes	45	22.7
No	121	61.1
Unsure/cannot recall	11	5.5
Other	21	10.6

Note: FNP = family nurse practitioner.

Table 5. Should FNP programs be required to provide training and practice opportunities for performing clinical procedures?

	Total (N = 198)	Percent
Yes	189	95.5
No	3	1.5
Unsure	6	3.0

Note: FNP = family nurse practitioner.

laceration repair, incision and drainage of abscesses, skin biopsies, ECG interpretation, and X-ray interpretation as required skills to be mastered during the program. The skills should be taught in workshops or in simulated experiences within the FNP program to ensure uniformity of learning. Schools cannot rely on preceptors in the community to teach such skills, as no two clinical experiences are alike. Doctorate of Nursing Practice programs, with an expanded clinical hour requirement, should provide enhanced procedure skills and diagnostic interpretation expertise to their students. Skills related to specialty practice, such as bladder instillations or cardiac stress testing, would not need to be included. Skills such as these are more appropriately learned once hired by the specialty practice where such procedures are commonly performed.

Limitations

A limitation of our study was that we only surveyed FNPs. Our results are not generalizable to other NP populations, as NPs with different population foci will have a different set of frequently performed skills. We surveyed recent graduates, within the last 5 years. Those who graduated five years ago may have had a foggy recollection of their preparedness level on graduation, compared with more recent graduates. We surveyed attendees at a national nurse practitioner conference. These NPs were probably more likely to have taken a suturing or minor procedures class than other NPs because these courses are frequently offered at conferences. We did not differentiate between masters-prepared and doctorally prepared NPs. Future research should include differentiating between NPs educated at the master’s level versus the doctorate level. It would be interesting to determine if the DNP graduates are more prepared to perform procedures and interpret diagnostic studies compared with their masters-prepared colleagues. A detailed survey of FNP programs to determine the specific procedures taught and the method used to teach the procedures may help to standardize the curriculum across programs. In addition, it would be interesting to learn how NPs who learn

procedures and skills “on-the-job” after graduation (41.9% of respondents) are determined to have mastered the skill.

Implications for practice

This survey suggests that recently graduated FNPs feel their education did not adequately prepare them to perform procedures that are commonly performed by FNPs. Colleges of nursing that are graduating FNPs should strongly consider increasing the number of hours students spend learning procedures and require students to demonstrate mastery of certain procedures before graduation.

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