

CAPACITY OF, AND DEMAND FOR, PEDIATRIC NURSE PRACTITIONER EDUCATIONAL PROGRAMS: A MISSING PIECE OF THE WORKFORCE PUZZLE^{☆, ☆ ☆}

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ADVISORY COMMITTEE OF THE AMERICAN BOARD OF PEDIATRICS¹

Background: In contrast to family nurse practitioners and other adult nurse practitioners, the percentage of new pediatric nurse practitioners (PNPs) graduating each year has not increased. *Purpose:* The aim of this study was to determine whether the marginal increase in the pipeline for PNPs is related to a limit in the capacity of educational programs or whether unfilled student openings exist. *Methods:* Self-administered survey of program directors at all recognized PNP educational programs in the United States. *Results:* Approximately 10% of PNP programs in the United States were either closed, put on hold, or did not have new graduates in the last 3 years. Even with these closures, over 25% of active programs did not fill all available positions for the class entering in 2012. *Conclusion:* Despite evidence that demonstrates plans by employers to hire a greater number of PNPs in a variety of clinical venues including pediatric hospitals, primary care and subspecialty pediatric practices, the PNP pipeline has remained relatively stagnant. More than one third of program directors do not believe that their PNP program is currently at capacity, indicating that underutilized capacity to educate PNPs is a hindrance to meeting the current and future demands for these professionals. (Index words: Pediatric nurse practitioner (PNP); Education programs; Capacity) *J Prof Nurs* 0:1–7, 2015. © 2015 Elsevier Inc. All rights reserved.

PREVIOUS STUDIES HAVE shown that, in aggregate, the number of new nurse practitioners graduating from education programs has approximately doubled over the past 15 years (Auerbach, 2012; Freed, Dunham, Loveland-Cherry, & Martyn, 2010). However, when the pipeline is examined by the specific type of nurse practitioner, the data demonstrate that, in contrast to

family nurse practitioners and other adult nurse practitioners, the percentage of new pediatric nurse practitioners (PNPs) graduating each year has not increased (Fang, Htut, & Bednash, 2008; Fang, Hu, & Bednash, 2011; Fang, Li, & Bednash, 2012, 2013; Fang, Tracy, & Bednash, 2009, 2010; Fang, Wilsey Wisniewski, & Bednash, 2007; Freed et al., 2010). With a growing

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demand for PNPs nationwide, understanding the reasons behind this phenomenon is important to the pediatric health care provider workforce and to ensuring an adequate supply of professionals to provide care to children (Freed, Dunham, Loveland-Cherry, Martyn, & Moote, 2011, Freed, Dunham, Moran, & Spera, 2012).

The purpose of this study was to determine whether the lack of increase in the numbers of new PNPs was a function of limited capacity of educational programs or whether there was insufficient interest in PNP education by student applicants. Such information will be helpful in developing strategies for address the growing demand for PNPs in the health care system.

Methods

Sample

The Pediatric Nurse Certification Board (PNCB) provided a sample of 106 universities and colleges that offer PNP educational programs in the United States. The venues offer either primary care, acute care, or dual-degree programs. To assess trends in program capacity and enrollment, we attempted to survey program directors at all PNCB recognized programs in the United States.

Survey Instrument

Content experts from national PNP organizations were consulted, and focused discussions with representatives from the Association of Faculties of PNPs preceded the development of the survey instrument. A structured questionnaire was developed that focused on exploring trends in PNP educational program capacity and enrollment. Following review by faculty and content experts and revisions, the questionnaire included 28 fixed-choice and 5 open-ended items designed to be completed via telephone in 15 minutes or less.

Questionnaire Administration

The research team sent a prenotification packet to the 106 program directors to inform them of the research study. Each packet contained a personalized letter signed by Drs. Gary Freed, Kristy Martyn, and Elizabeth Hawkins-Walsh and a \$5 bill as an incentive to participate. From November 2012 through February 2013, trained research staff contacted the program directors, explained the purpose of the study, and obtained their verbal consent to participate. Questions were posed by the research assistant from written surveys. Most data were collected via telephone interviews, with additional information related to exact enrollment numbers collected via electronic mail for three respondents. The study was approved by the University of Michigan Medical School Institutional Review Board.

Data

Questions examined both enrollment and capacity at each program for the current year and the previous 3 years. The questions aimed to reveal trends among programs, and learn more about the changes and difficulties of increasing program capacity. Additional

questions were designed to highlight faculty perceptions of plans and barriers to program expansion.

Results

Response Rate

Three of the 106 universities and colleges on the list were found to be duplicates. Ten of the remaining 103 venues were removed from the sample because they reported that, either their acute care or primary care programs had been put on hold or closed (some temporarily and some permanently). Of the remaining 93 venues, 76 program directors completed the telephone interview and 2 directors refused, representing an overall response rate of 81.7%.

At least five attempts were made to contact nonrespondents to determine the status of their programs. Of the 15 programs that did not respond to the initial survey, 11 confirmed that their program is currently open and plan to accept students for the 2014 academic year. One program is currently on hold. The status of the remaining three programs is unknown.

First, frequency distributions were calculated for all survey items. Next, comparisons were made between primary care, acute care, and dual-degree programs. There are slight variations in the total number of program directors noted for some results due to occasional item nonresponse for specific questions, and some program directors lead both primary care and acute care PNP programs. As such, there is slight variation in the number of responses presented for each item.

Closed Programs

In the case of the 10 programs not currently accepting students, most had been closed to enrollments within the previous 3 years. The most common reasons provided were lack of student interest or faculty resources.

Program Enrollment and Capacity

Most program directors (89%; $n = 68$) reported that their program offers primary care education, whereas 22% ($n = 17$) offered acute care education. Seven of the programs (9%) reported dual-track education was available.

Nearly three fourths of program directors (74%; $n = 52$) reported that all available open slots for new PNP students were filled for the 2012 academic year. However, approximately half (46%; $n = 32$) of program directors indicated that their program usually had unfilled slots over the previous 3 years (Table 1).

The total number of overall PNP students enrolled in a program ranged from 5 to 100, with the mode being 7 students. The mean number of students was 34 and the median was 30. Just over half of program directors (57%; $n = 43$) reported that they consider their program to be at overall capacity.

Over a third of PNP program directors (43%; $n = 32$) reported that they had not had any student attrition in the previous 3 years. Among those schools that had experienced attrition (57%; $n = 42$), a greater proportion of directors indicated that it

Table 1. Open Slots for New Students Filled in the 2012 Academic Year ($n = 70$)

	Overall ($n = 70$)	Primary care ($n = 63$)	Acute care ($n = 17$)	Dual ($n = 6$)
	% (n)	% (n)	% (n)	% (n)
All available slots for new PNP students filled (2012)	74 (52)	73 (46)	82 (14)	67 (4)
Over past 3 years, program usually had unfilled PNP slots	46 (32)	45 (29)	56 (9)	67 (4)
New students this academic year (2012)	M (range)	M (range)	M (range)	M (range)
No. of new, full-time PNP students	7 (0–38)	7 (0–38)	6 (0–23)	8 (0–23)
No. of new, part-time PNP students	8 (0–45)	8 (0–45)	18 (0–45)	15 (0–45)
No. unfilled PNP slots	7 (0–20)	7 (0–20)	12 (0–20)	18 (16–20)

was primarily among part-time rather than full-time students (Table 2).

Of the program directors who experienced some attrition, 15% reported a decrease in attrition over the previous 3 years, whereas only 8% reported an increase in attrition.

Nearly half of PNP program directors (48%; $n = 36$) overall reported that the number of PNP students enrolled in their program has been increasing over the previous 3 years. Of the acute care programs, 71% ($n = 12$) indicated that the number of enrolled students had been increasing, compared with 48% ($n = 31$) of the primary care programs and 57% ($n = 4$) of the dual programs. Among programs where enrollment is increasing, program directors indicated that it was due to increased interest in PNP education (93%; $n = 39$), perception of increased market demand (74%; $n = 31$), and program innovations such as on-line courses (62%; $n = 26$).

A small cohort of PNP program directors (5%; $n = 4$) reported decreasing enrollments or changing enrollments from year to year (8%; $n = 6$). Most program directors who reported decreasing or fluctuating enrollments 80% ($n = 8$) attributed this to decreased student demand for PNP slots and perceptions of limited market demand for graduates. Half of these program directors also indicated a shortage of clinical sites (40%; $n = 4$) as a reason for decreased enrollment.

In addition to seeking information about numbers of enrollments, program directors were also asked if their programs had increased capacity itself.

Half of program directors (53%; $n = 37$) indicated that their program had increased program capacity over the previous 5 years. A greater proportion of program directors of acute care (76%; $n = 13$) and dual-track (83%; $n = 5$) programs, compared with primary care programs, reported an increase in program capacity.

Among the 35 program directors that reported having taken steps to increase program capacity, 80% ($n = 28$) reported increased interest in PNP education as the reason for the expansion. More than half of program directors (57%; $n = 20$) cited program innovations such as dual programs or on-line courses, and 40% ($n = 14$) credited increased program marketing. Among the program directors who indicated a decrease in program capacity ($n = 5$), 60% ($n = 3$) cited a shortage of clinical sites or insufficient clinical preceptors as the reason for the decrease.

More than one quarter of program directors (29%; $n = 21$) reported that there is a waitlist for enrollment into their program. A greater proportion of directors from acute care programs (40%; $n = 6$) reported a waitlist compared with primary care (29%; $n = 19$) or dual-track programs (20%; $n = 1$). Approximately half of program directors with a waitlist reported that the number of students on the waitlist had stayed approximately the same over the previous 3 years (53%; $n = 16$), whereas 37% ($n = 11$) said that the number had increased.

Faculty Hiring and Retention

Most program directors (63%; $n = 48$) reported that they had not experienced any difficulty in hiring or retaining PNP faculty over the previous 5 years. However, nearly half of the acute care (41%; $n = 7$) and dual-track (43%; $n = 3$) programs reported difficulty in hiring qualified PNP faculty, compared with primary care (21%; $n = 14$) (Table 3).

Among the 28 programs that had difficulty hiring or retaining faculty, 75% ($n = 21$) reported faculty compensation, 71% ($n = 20$) reported lack of qualified candidates, and 64% ($n = 18$) reported faculty resignations (for other positions, not retirement) as the primary reasons for their difficulty. Other reasons mentioned less frequently were too great a workload (54%; $n = 15$) and lack of institutional or administrative support (39%; $n = 11$).

Table 2. Program Attrition, or Dropping Out, Once Students Matriculate, Including Full-Time and Part-Time Students Over the Past 3 Years ($n = 74$)

	Overall ($n = 74$)	Primary care ($n = 66$)	Acute care ($n = 16$)	Dual ($n = 6$)
	% (n)	% (n)	% (n)	% (n)
No	43 (32)	46 (30)	44 (7)	33 (2)
Yes, primarily for full-time students	15 (11)	12 (8)	6 (1)	33 (2)
Yes, primarily for part-time students	26 (19)	24 (16)	44 (7)	33 (2)
Yes, for both full and part-time students	16 (12)	18 (12)	6 (1)	0 (0)

Table 3. Has Your Program Experienced Any Difficulty in Hiring or Retaining PNP Faculty Over the Previous 3 Years? (*n* = 76)

	Overall (<i>n</i> = 76)	Primary care (<i>n</i> = 68)	Acute care (<i>n</i> = 17)	Dual (<i>n</i> = 7)
	% (<i>n</i>)	% (<i>n</i>)	% (<i>n</i>)	% (<i>n</i>)
No	63 (48)	59 (40)	53 (9)	57 (4)
Yes, in hiring faculty	18 (14)	21 (14)	41 (7)	43 (3)
Yes, in retaining faculty	7 (5)	7 (5)	0 (0)	0 (0)
Yes, in both hiring and retaining faculty	12 (9)	13 (9)	6 (1)	0 (0)

Nearly two thirds of program directors (65%; *n* = 49) reported that they plan to recruit additional faculty over the next 3 years, either for new positions or as replacements for resignations and/or retirements. A greater proportion of program directors at acute care (50%; *n* = 6) and dual-track (75%; *n* = 3), compared with primary care (27%; *n* = 12), programs reported that they plan to recruit faculty for new positions.

Clinical Education

Only a small minority of all PNP programs (16%; *n* = 12) reported they had no difficulty securing clinical sites for students over the previous 3 years. Program directors reported problems for both new sites and for sites they had used in the past. Among programs that have had difficulty in securing clinical sites, most indicated that this was due to the site being on hiatus due to transition to electronic medical records (EMRs; 95%; *n* = 61); competition with family nurse practitioner (FNP; 86%; *n* = 55), medical school (81%; *n* = 52), or other PNP (73%; *n* = 47) education programs for slots; and preceptor burnout (75%; *n* = 48) (Table 4). Nearly all program directors (96%; *n* = 73) reported that they plan to secure additional clinical sites over the next 3 years.

On-line Courses

Most PNP program directors (86%; *n* = 65) reported that their program currently offers on-line or hybrid courses.

Nearly all (95%; *n* = 62) cited flexibility for students as the reason for offering the courses on-line.

Future Plans

Half of program directors overall (51%; *n* = 36) reported that they plan to keep program capacity at its current level over the next 3 years, and 46% (*n* = 32) reported that they plan to increase program capacity. This was more common among acute care programs (73%; *n* = 11) compared with primary care (40%; *n* = 25).

Among those programs that plan to increase capacity over the next 3 years (46%; *n* = 32), program directors cited perception of increase market demand (84%; *n* = 27), program innovations such as on-line programs (78%; *n* = 25), increased interest in PNP education (81%; *n* = 26), and increased program marketing (69%; *n* = 22) as the primary reasons for the increase (Table 5).

Discussion

Among the most important findings from this study is that approximately 10% of PNP programs in the United States closed or did not have new graduates in the last 3 years. Even with some closures, over 25% of programs did not fill all available positions for the class entering in 2012. In addition, almost half of programs reported that they usually had unfilled slots in the past 3 years. Although the results of this study support a recent increase in the number of programs that have filled their

Table 4. The Primary Issues Programs Have Faced Securing Clinical Sites Over the Past 3 Years? Please Choose All That Apply (*n* = 64)

	Overall (<i>n</i> = 64)	Primary care (<i>n</i> = 59)	Acute care (<i>n</i> = 13)	Dual (<i>n</i> = 7)
	% (<i>n</i>)	% (<i>n</i>)	% (<i>n</i>)	% (<i>n</i>)
Site on hiatus for PNP students due to transition to EMRs	95 (61)	95 (56)	77 (10)	86 (6)
Competition with FNP programs for clinical slots	86 (55)	86 (51)	85 (11)	86 (6)
Competition with medical school programs for clinical slots	81 (52)	80 (47)	77 (10)	71 (5)
Preceptor burnout	75 (48)	78 (46)	69 (9)	86 (6)
Competition with other PNP programs for clinical slots	73 (47)	71 (42)	77 (10)	86 (6)
Competition with physician assistant programs for clinical slots	52 (33)	49 (29)	38 (5)	14 (1)
Loss of clinical sites generally	48 (31)	47 (28)	23 (3)	57 (4)
Preceptor productivity issues	39 (25)	36 (21)	23 (3)	29 (2)
Site discontinued clinic for PNP students due to transition to EMRs	34 (22)	34 (20)	15 (2)	43 (3)
Other*	28 (18)	27 (16)	38 (5)	29 (2)
Difficulty negotiating contracts	23 (15)	22 (13)	23 (3)	14 (1)
Competition with undergraduate nursing programs for clinical slots	9 (6)	8 (5)	0 (0)	14 (1)

* Other reasons included the following: lack of compensation/incentives for preceptors, site hiatus, overall competition.

Table 5. Why Do You Plan to Increase the Capacity of Your Program Over the Next 3 Years? Please Choose All That Apply (*n* = 32)

	Overall (<i>n</i> = 32)	Primary care (<i>n</i> = 25)	Acute care (<i>n</i> = 11)	Dual (<i>n</i> = 4)
	% (<i>n</i>)	% (<i>n</i>)	% (<i>n</i>)	% (<i>n</i>)
Perception of increased market demand (i.e., PNP viewed as marketable)	84 (27)	80 (20)	82 (9)	50 (2)
Increased interest in PNP education	81 (26)	80 (20)	73 (8)	50 (2)
Program innovations/changes (e.g., dual programs, on-line courses)	78 (25)	76 (19)	82 (9)	100 (4)
Increased program marketing	69 (22)	64 (16)	64 (7)	75 (3)
Increased clinical sites/residency options	50 (16)	40 (10)	55 (6)	25 (1)
Increased funding will allow us to hire additional faculty	41 (13)	40 (10)	45 (5)	0 (0)
New partnerships with other schools will allow us to expand program (e.g., on-line courses or shared classes)	31 (10)	28 (7)	45 (5)	0 (0)
Increased funding will allow us to expand program	25 (8)	20 (5)	45 (5)	0 (0)
New partnerships with other education programs will allow us to expand program (e.g., PNP and midwifery)	25 (8)	28 (7)	36 (4)	25 (1)
Other *	6 (2)	8 (2)	9 (1)	0 (0)

* Other reasons included the following: local hospital demand, perceived demand from Affordable Care Act.

capacity, the change is likely to be too little to meet current demand when the closure of other programs is taken into account. These findings demonstrate a sobering counterpoint to recent studies demonstrating a high demand for PNPs in the workforce currently and into the future (Cooper, 2007; Freed et al., 2011, 2012; Starmer, Duby, Slaw, Edwards, & Leslie, 2010).

Results of national surveys of both pediatric primary care and subspecialty physicians have found broad-based plans to hire additional PNPs over the next several years (Freed et al., 2011). In addition, a study of chief executive officers from Children's Hospitals demonstrated intention to hire PNPs to address potential workforce shortages due to medical resident work hour redesign (Freed et al., 2012). From a policy standpoint, the American Academy of Pediatrics issued a report on their vision for pediatric care in the next decade, which projected expanded teams of physicians and PNPs providing both primary care and subspecialty care to children with complex chronic conditions (Starmer et al., 2010).

Almost half of PNP programs did report increased enrollment over the past 3 years. This may be a result of program closure in some locations or independent increased demand for positions in other venues. Regardless, in contrast to the dramatic rise in the overall number of new nurse practitioners entering the workforce on an annual basis, the overall pipeline for PNPs has been relatively stagnant for at least the last decade (Freed et al., 2010). This is significant because when policymakers or workforce analysts examine the overall trends in the nurse practitioner pipeline, the large overall increase masks the lack of meaningful increase in the PNP pipeline specifically (Freed et al., 2010). An important lesson in nursing workforce studies is that unless one examines the PNP workforce data separately from the aggregate, there would be no appreciation of the implications for pediatric care (Freed et al., 2010).

Another important finding was that more than half of the programs had experienced attrition over the previous

3 years. This is difficult to interpret because the actual number of students leaving the programs is unknown. Further study is needed to identify and examine the magnitude causes of attrition.

The information produced by this study demonstrates that there is an availability of unfilled program slots, despite the program closures. This suggests that efforts to increase demand for these slots are needed.

Faculty Hiring and Retention

High-quality faculty are essential for the academic integrity of PNP educational programs. Our study found that approximately one third of programs experienced difficulty in hiring and/or retaining PNP faculty over the past 5 years. The need is even greater in acute care and dual-track PNP programs, as both acute care and dual track programs require PNP faculty who are certified in acute care pediatrics. Because nearly two thirds of programs also intend to recruit additional faculty in the near future, it is unclear if there will be a sufficient pool of available faculty to meet that demand. Further, the potential for programs to accommodate any future increase in trainees will be directly affected by any limitation in faculty recruitment.

Difficulties With Clinical Sites

Most program directors reported difficulties in both securing new clinical sites as well as maintaining the sites they have used in the past. A variety of reasons for these difficulties were cited by program directors, some appearing to be time limited and some likely to be more chronic in nature. The most common reason cited was that many clinical sites were on a temporary hiatus for PNP students due to the complexities of their clinical services being transitioned to an EMR. Although these transitions may play out over a 12- to 15-month horizon in each clinical setting, the number of clinical practices that will experience such transitions is likely to remain fairly constant over the next 3–5 years as such changes

spread through the U.S. health system ([The Kaiser Commission on Medicaid & the Uninsured, 2009](#)).

A more ominous, and potentially long-term problem is that of increased competition for clinical sites with family nurse practitioner and physician assistant education programs as well as medical students. Class sizes for the clinical education of all of these types of students have increased markedly over the past 5 years, and, as such, it appears their demands have negatively impacted PNP education opportunities ([Association of American Medical Colleges \(AAMC\), 2012](#); [Freed et al., 2010](#); [Physician Assistant Education Association, 2013](#)). It is unclear if this has been a conscious and coordinated decision on the part of schools of nursing, clinical sites themselves, or if these were simply responses to academic pressures from a variety of sources. Regardless, if there is a desire to meet the growing demand for PNPs in the pediatric community, then a deliberate strategy on the part of schools of nursing, Children's Hospitals, and other institutions is required to ensure that a lack of clinical sites is not a hindrance to PNP education.

Changes in Educational Methods

There is an increasing trend of programs to offer on-line courses and hybrid courses ([American Association of Colleges of Nursing \[AACN\], 2007](#); [National Task Force on Quality Nurse Practitioner Education, 2012](#)). It is unclear if this is a response to student demand or to attempts at greater efficiency of educational resources. On-line courses also offer opportunities for students not in the immediate area of PNP program to gain such education ([AACN, 1999](#); [Gardenier, 2011](#)). However, students who cross state lines for their coursework may experience unanticipated difficulties in securing clinical education sites and obtaining recognition from their home state licensing board regarding all aspects of their education ([Oregon State Board of Nursing](#)). An example of this type of restriction is the rule created by the Oregon Board of Nursing, which withholds licensure for those nurse practitioners who attend an on-line nurse practitioner educational program in another state without prior authorization and approval by the Board of Nursing in Oregon. The same ruling threatens sanctions against nurse practitioners licensed in Oregon who serve as preceptors for such students. The impact upon adequacy of PNP workforce within the state of Oregon (which lacks a PNP program within the state) is alarming. Other barriers to on-line education are being raised within many individual state departments of higher education that are levying new fees and charges in an attempt to limit the incursion within a state of an out of state educational institution.

Programs Response to Perceived Market Changes

Despite the closure of some programs, almost half of directors plan to increase the capacity of their future classes. This was especially true among acute care programs, perhaps signaling the perception of increased market demand and recognition of this educational

pathway. Program directors also reported the advent of on-line classes has fueled greater demand and perhaps an increase in PNP education. As there are still mixed perceptions of the career potential for newly graduated PNPs, greater efforts must be undertaken to inform potential students of the growing need for these professionals across a wide array of clinical settings ([Auerbach, 2012](#); [Freed et al., 2013](#); [Starmer et al., 2010](#)).

Further study is needed to explore the possible geographic pattern of PNP program closures or failure to increase capacity. It is interesting to note that although some program directors reported increased market demand as a reason for expanding program enrollments and capacity, other program directors cited the opposite as a reason for decreased enrollment. It will be important to examine the possible role played by nursing faculty or administration in making decisions to close PNP programs.

In addition, recent efforts regarding the institution of the doctor of nursing practice for all advanced practice nurses (APNs) may impact the demand for PNP training. Although member schools of the AACN in 2004 endorsed moving from a master's degree to a doctoral degree requirement, a new report states that not all schools will achieve this transition by the goal of 2015 ([AACN, 2014](#)). Going forward, future studies of the APN workforce should address any changes as a result of new educational requirements or trends.

Conclusion

There have been significant changes to the capacity of PNP education nationally. Some programs have been increasingly successful in attracting potential students, but overall capacity continues to exceed demand for PNP education. This is despite employer plans to hire a greater number of PNPs from a variety of clinical venues and practice types including pediatric hospitals, and both primary care and subspecialty pediatric practices. Greater efforts to promote PNP education will be required to increase the production pipeline and utilize the capacity in educational programs that currently exist. Efforts need to focus on filling current available placements and increasing class size. Both would help address the need for an increasing PNP workforce. A critical first step to promote PNP education may begin with informing deans of schools of nursing, faculty, and potential students regarding the documented demand for PNPs.

Contributors' Statement

Gary L. Freed: Dr. Freed conceptualized and designed the study, critically reviewed and revised the manuscript, and approved the final manuscript as submitted.

Lauran M. Moran: Ms. Moran conducted data collection and tracking, coded the responses, reviewed and revised the manuscript, and approved the final manuscript as submitted.

Kelly M. Dunham: Ms. Dunham designed the data collection instrument, coordinated and supervised data collection, and approved the final manuscript as submitted.

Elizabeth Hawkins-Walsh: Dr. Hawkins-Walsh reviewed and revised the data collection instrument, critically reviewed the manuscript, and approved the final manuscript as submitted.

Kristy K. Martyn: Dr. Martyn reviewed and revised the data collection instrument, critically reviewed the manuscript, and approved the final manuscript as submitted.

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