

# PHC

## ABSTRACT

**Introduction:** This study explored the current practice responsibilities of pediatric nurse practitioners (PNPs) from a national perspective. Educational preparation, geographic region of practice, years of employment as a PNP, type of employment setting, and full-time versus part-time employment were examined.

**Method:** From a randomly selected sample (N = 997), a total of 387 respondents returned their questionnaire, resulting in 325 usable questionnaires.

**Results:** Years of experience as a PNP, setting of employment, geographic region, prescriptive authority, and subspecialty practice were significantly related to various health supervision and illness-focused activities performed by PNPs, as well as level of management responsibility. Anticipatory guidance supervision continues to be an integral part of the PNP role. PNPs report that they assume major responsibility for the health assessment and management of children with common pediatric illnesses as well as chronic illnesses and conditions.

**Discussion:** The ability to prescribe prescription medications produced the greatest overall effect on PNP role activities and level of management responsibility. Years of experience exerted an interesting effect on role functions related to the overall health supervision and illness-focused activities in which PNPs engaged. Implications for the educational preparation of PNPs, the updating of national certification examinations, and planning for adequate numbers in the workforce to replace the cohort of retiring PNPs in the next 20 years are discussed.

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# Role Delineation Study of Pediatric Nurse Practitioners: A National Study of Practice Responsibilities and Trends in Role Functions



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**T**his research study, partially sponsored by the National Certification Board of Pediatric Nurse Practitioners and Nurses (NCBPNP/N), addresses the results of a nationally based job analysis study of pediatric nurse practitioners (PNPs). The rapid changes in the health care delivery system in the late 1990s and the need to ensure that the NCBPNP/N certification examination for PNPs was reflective of current job responsibilities and activities provided the impetus for this role delineation study of a large, random sampling of PNPs from across the United States.

## PURPOSE

This research had two primary goals. First, the NCBPNP/N needed to identify the current role responsibilities and job functions of PNPs in their various job settings. Many years had elapsed since the PNP role was last studied, and significant changes in the health care delivery system have had an impact on the functions of all health care providers. Employers, educators, and consumers of such services also need accurate, current data about the role responsibilities and functions of PNPs. Second, the need existed to determine whether there were significant differences in the role functions and responsibilities of PNPs based on their geographic site of practice, number of years of practice, and type of clinical setting. The impetus for investigating these

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factors was sparked by concerns expressed by individual state boards of nursing, as well as the National Council of State Boards of Nursing (NCSBN), which was looking closely into the practice of all nurse practitioners (NPs).

## METHODS

### Questionnaire Development

Prior research studies that investigated the role of either PNPs or NPs were carefully analyzed in preparation for developing the PNP role delineation questionnaire. In addition, documents that described the practice and knowledge base of the PNP role were reviewed, including the Philosophy Conceptual Model, Terminal Competencies for the Education of Pediatric Nurse Practitioners (Association of Faculties of Pediatric Nurse Practitioner and Associates Programs, 1996) and the National Association of Pediatric Nurse Associates and Practitioners (NAPNAP) White Paper on Educational Preparation and Role Parameters of PNPs (NAPNAP, 1995). The conceptual model used in the NP role delineation study conducted by the NCSBN (1997) and the role function survey instrument developed for the American College of Nurse-Midwives Certification Council (Fullerton, 1994) were particularly relevant to this investigation. These two studies served as guides in constructing the questionnaire used in this study and provided a framework for this study.

A listing of selected activities was developed using a number of resources, such as the content outline of the NCBPNP/N certification examination, current pediatric health care texts, and other relevant role study instruments. In late summer and early fall 1997, the first draft of the PNP role delineation instrument was critiqued for face validity by a selected group of 8 PNPs and 2 pediatricians and then randomly sent to a pilot study sample composed of PNP educators ( $n = 15$ ) and new graduates ( $n = 15$ ) of PNP programs. The return rate from the pilot study was 67%, and minor refinements were made to the questionnaire based on feedback.

### Description of the Questionnaire

The final revision of the PNP role delineation questionnaire contained 3 sections that investigated job-related activ-

ities (ie, health supervision and illness-focused activities [175 Likert scale items], management of specific clinical problems [303 Likert scale items], and professional role responsibilities [21 items]), along with an introduction section that inquired about demographic information.

Numerous health supervision and illness-focused activities related to well-child health supervision and management, counseling, specialized counseling, sick child-related care, and in-hospital, emergency department, or prompt care unit activities were investigated in this study. Subjects were asked to rate how often (frequency) the activity was performed as part of their job expectations by using a 5-point rating scale that ranged in frequency from "never" to "weekly." The importance of an activity in the work setting was judged by a 4-point scale ranging from "not applicable" to "most important."

**The vast majority (84%) of the sample had prescriptive authority under their state's nurse practice law.**

The "level of management of responsibility" section listed clinical problems—conditions, diseases, disorders—seen in pediatrics. The list of pediatric illnesses and conditions was developed using a number of resources, such as the content outline of the NCBPNP/N certification examination and listings in current pediatric health care texts. Subjects ranked their level of responsibility for the assessment and management of these problems based on certain characteristics. A 5-point rating scale was used to determine the highest level of responsibility the PNP would have in the assessment and management of each clinical problem. Scores for each item could range from a zero, if a patient with an identified problem would never be seen by the PNP, to a 4, if the PNP would

complete the history and physical examination as well as determine the management plan based on office protocol and without first consulting with a physician. The pediatric problems were divided by body systems, behavioral conditions, and emergency treatment.

Activities that reflected professional role responsibilities that may or may not be expected in a work setting also were investigated. Subjects were asked to respond either "yes" or "no" if the activity was performed in the work role or outside of work. The topics selected for this selection were derived from a review of the nursing literature.

### Procedures

This study, including instrument development, was conducted under the auspices of the NCBPNP/N. The NCBPNP/N provided a computer list of names and addresses of 3773 persons certified as PNPs. A computerized random sample of 994 names was selected and compared with the original population for consistency in regional representation. The regional percentages from the sampling matched the percentages for the regional population of interest and were as follows: Northeast (26.5%), Midwest (23.6%), South (24.1%), and West (25.8%). The percentages of respondents by region were also similar.

The questionnaire was anonymous and did not contain any identifying code that would match a questionnaire to a particular subject. Return of the questionnaire constituted consent to participate in this study. Questionnaires, accompanying cover letters, and stamped return envelopes were mailed during the first 3 months of 1998. Any questionnaire packet returned because of a change of address was sent out for a second mailing if the NCBPNP/B had received a new address. Ten packets were returned as undeliverable. A second mailing was not deemed necessary given the response to the initial mailing; data collection was completed by May 1, 1998. Data were coded and analyzed using the Statistical Package for the Social Sciences.

## RESULTS

### Subjects

Of the 994 questionnaires mailed, 387 subjects returned completed questionnaires. An additional 8 subjects chose

**TABLE 1** Demographic characteristics of all study respondents (N = 387)

Variable	N	%
Age (y)		
≤29	9	2.3
30-39	81	21
40-49	171	44.2
50-59	94	24.2
≥60	32	8.3
Sex		
Female	378	97.6
Male	9	2.4
Ethnic background		
African American	4	1
Asian/Pacific/Oriental	3	0.8
Caucasian	370	95.6
Mexican American	4	0.8
Native American	4	0.8
Not provided	4	1
Basic PNP educational preparation		
CE program	148	38.2
Masters program	189	48.8
Post masters program	34	8.8
Other	16	4.2
Highest academic degree		
Associate	7	1.8
Bachelor	65	16.8
Masters	265	68.5
Doctoral	10	2.6
Other	21	5.4
Missing	19	4.9
Currently employed in nursing		
Yes	357	92
No	30	8
Hold additional NP or advanced practice credentials		
Yes	70	18.1
No	316	81.8
Missing	31	0.8

CE, Continuing education; NP, nurse practitioner.

**TABLE 2** Twenty-one most frequently identified "weekly activities" by rank order (N = 325)

Task performed weekly	n	%	M*	SD
Evaluate growth patterns/parameters	296	91.1	3.85	0.61
Perform complete physical examination—health supervision	294	90.5	3.77	0.84
Evaluate developmental milestones	290	89.2	3.81	0.73
Conduct illness-focused history	289	88.9	3.77	0.78
Perform a regional physical examination on a sick child	289	88.9	3.75	0.83
Elicit age-appropriate interval history	288	88.6	3.74	0.87
Elicit complete health history	277	85.2	3.72	0.79
Determine plan for anticipatory guidance	277	85.2	3.70	0.85
Prescribe over-the-counter medications	274	84.3	3.69	0.88
Order and interpret common laboratory tests for sick children	273	84.0	3.62	1.02
Counsel about smoke-free environment and smoke detectors	272	83.7	3.62	0.99
Provide health supervision for children aged 1-5.9 y	272	83.7	3.61	1.08
Order and interpret laboratory screening tests for health supervision	272	83.7	3.57	1.11
Prescribe pharmacologic agents for sick children	266	81.8	3.46	1.28
Order appropriate immunizations	265	81.5	3.55	1.12
Provide care for sick children ages 13 mo-12.9 y	262	80.6	3.57	1.08
Counsel about car seat and crib safety	262	80.6	3.48	1.21
Provide health supervision for infants aged 2-12 mo	256	78.8	3.49	1.21
Counsel about poisoning, toy safety, choking, electrical outlets	253	77.8	3.46	1.16
Provide health supervision for children aged 6-12.9 y	251	77.2	3.48	1.15
Provide care for sick infants aged 2.1-12.9 mo	251	77.2	3.42	1.26

\*Mean score—values by frequency: 4 = weekly; 3 = monthly; 2 = quarterly; 1 = rarely; 0 = never.

(8%) reported that they were either retired, temporarily unemployed, raising young children, working on an academic degree, or in another field of employment. The return response rate was 39%. The final sample size used for analysis of PNP role functions was 325, and power analysis indicated that this sample was sufficiently large to be used for this study.

### Demographic Background

Demographic characteristics of the 387 respondents are described in Table 1. The respondents included an almost exclusive sample of White women. Age distribution revealed that more than two thirds of the sample were between the ages of 40 and 59 years. Eighteen percent of the PNPs indicated that they held additional NP or advanced practice credentials. The mean number of months as a PNP was 133.7 (SD = 87.4), or 11.14 years. Slightly less than half the sample (48%) received their basic PNP education in a PNP master's degree program, and 72% of the subjects held a master's degree as their highest academic credential. The subjects (5.7%) who indicated the "other" category for their

highest degree listed diploma in nursing and legal degrees.

Of the respondents currently employed as a PNP (n = 325), 73% worked more than 24 hours per week and another 24% worked more than 8 to 16 hours per week in this role. These respondents were asked to identify the type(s) of position they held in their work setting. Ninety-five percent (n = 309) characterized their role in the working setting as that of a "clinical nurse practitioner." The second most frequently identified role was "consultant," with 18.7% (n = 61) listing this role. Seven percent identified themselves as a "researcher." Information about employment setting(s) also was obtained. Respondents were asked to identify all categories of work settings that applied. Forty percent of the employed PNPs listed solo or group practice with a pediatrician or physician as their employment setting, 35% listed clinic/health center or outpatient hospital, 7.2% identified health maintenance organization, and approximately 10% identified prompt care unit, emergency department, and inpatient hospital settings. The "other" employment category was selected by

not to participate and returned blank questionnaires; two additional subjects sent back a blank questionnaire and indicated that they were no longer able to work because of chronic disabilities; another 10 questionnaires were returned because of an insufficient mailing address. Sixty-two subjects were eliminated from data analysis on the key role functions variables because they were not currently employed as PNPs. Some of these subjects (7.7%) were employed in other nursing roles (eg, neonatal nurse practitioner, family nurse practitioner, clinical nurse specialist); others

**TABLE 3** Twenty-two most frequently identified “certainly” important activities by rank order (N = 325)

Tasks identified as certainly important	n	%	M*	SD
Perform regional physical examination on sick children	278	85.5	1.91	0.29
Elicit a complete health history	278	85.5	1.90	0.29
Perform complete physical examination—health supervision	274	84.3	1.94	0.24
Order and interpret common laboratory tests for sick children	273	84.0	1.93	0.24
Evaluate growth patterns/parameters	273	84.0	1.90	0.30
Contact child protective services	272	83.7	1.90	0.31
Conduct illness-focused history	271	83.4	1.89	0.31
Elicit age-appropriate interval history	268	82.5	1.90	0.31
Refer child and/or family to medical or other health care specialists	267	82.2	1.88	0.33
Prescribe pharmacologic agents	267	82.2	1.93	0.25
Order appropriate immunizations	266	81.8	1.91	0.29
Order and interpret laboratory screening tests—health supervision	263	80.9	1.89	0.33
Evaluate developmental milestones	263	80.9	1.90	0.30
Counsel about the recognition of early signs of illness	262	80.6	1.92	0.28
Develop a health supervision management plan	258	79.4	1.88	0.33
Provide care for sick children aged 13 mo-12.9 y	258	79.4	1.89	0.31
Perform health supervision for children aged 1-5.9 y	256	78.8	1.89	0.31
Counsel about smoke-free environment and smoke detectors	255	78.5	1.85	0.36
Provide care for sick infants aged 2.1-12.9 mo	253	77.8	1.90	0.30
Perform health supervision for children aged 6-12.9 y	251	77.2	1.87	0.35
Determine plan for anticipatory guidance	251	77.2	1.83	0.40
Participate in the disease management—chronic illnesses	251	77.2	1.84	0.39

\*Mean score—values of importance: 2 = certainly; 1 = possibly; 0 = never or not applicable.

7.6% of the employed respondents. The vast majority (84%) of the sample had prescriptive authority under their state’s nurse practice law. Ten subjects indicated that they did not have prescriptive authority under state regulation but did prescribe medications to patients.

Because geographic differences in actual subject responses were an important consideration in this study, each of the main demographic variables was cross-tabulated by geographic region (South, West, Midwest, and Northeast). These variables included age (based on 5 categorical choices as identified in Table 1), gender, ethnic background, basic PNP education, basic registered nurse (RN) education, additional NP or advanced practice credentials, highest academic degree, years as an RN, number of years as a PNP, and present employment status (full-time, part-time, or unemployed). Chi-square analysis was done, and the only significant factor in this grouping of demographic variables was age,  $\chi^2$  (12, N = 366) = 22.71, ( $P < .05$ ). The Midwest region was represented by younger PNP’s than were the other 3 regions.

Cross tabulations of geographic region of employment by work-related demographic characteristics were done. These variables included number of hours per week employed (ie, 1 to 4 hours, 4.1 to 8 hours, 8.1 to 16 hours, 16.1 to 24 hours, and more than 24 hours), type of position (eg, administrator, consultant, clinical nurse practitioner, researcher, faculty), current employment setting (eg, solo or group practice with pediatrician or physician, health department, clinic/outpatient hospital setting, prompt care unit, etc), prescriptive privileges in state, writing of prescriptions, and practice in a subspecialist area. PNP’s in the Northeast and Midwest had significantly more employment in a clinic/health center,  $\chi^2$  (3, N = 366) = 9.17, ( $P < .05$ ). PNP’s in the Midwest indicated significantly more employment in a health maintenance organization and less in school districts,  $\chi^2$  (3, N = 366) = 10.82, ( $P < .05$ ). Fewer Midwestern PNP’s had prescriptive privileges, and they did not write prescriptions themselves as often as PNP’s did in other regions,  $\chi^2$  (3, N = 316) = 31.52, ( $P < .01$ ).

PNP’s in the South and West were less likely to be employed in inpatient settings,  $\chi^2$  (3, N = 366) = 12.09, ( $P < .01$ ).

### Health Supervision and Illness-focused Activities for Children—Newborn Through Late Adolescent Period: Scale Score by Domains

Study respondents employed as PNP’s (N = 325) were asked about various health supervision and illness-focused activities and tasks. Respondents were asked to rate each task and/or activity in two categories: frequency and importance of the task. Frequency was based on how often the task was performed by the respondent. A scale of *never* (not performed), *rarely* (perform yearly or longer period of time), *quarterly* (perform at least on a quarterly basis), *monthly* (perform on an every other or monthly basis), and *daily/weekly* (perform on a weekly, biweekly, or daily basis) was used. Importance of the task referred to the respondent’s perception of how essential or important it was for the PNP to be able to perform this task in the work setting as a measure of required competency for PNP’s. Respondents were asked to determine what effect not being able to perform the task as part of their work role would have on patient outcomes, treatment, or satisfaction. Items were to be scored as *not applicable* (task not performed), *never* (no effect on patient outcomes, treatment or patient satisfaction) or *not important, possibly important* (a minor effect on patient outcomes, treatment, or satisfaction), and *certainly very important* (a severe negative effect on patient outcomes or treatment). The top 21 activities identified as being performed weekly and the top 22 activities rated as very important are listed in Tables 2 and 3, respectively.

### Mean Item and Scale Score

Each health supervision and illness-focused item was scored for both frequency and importance responses. For the category of frequency, ratings of never, rarely, quarterly, monthly, and weekly received scores of 0, 1, 2, 3, and 4, respectively. Choices for importance ratings consisted of *not applicable, never* (not important), *possibly* (important), and *certainly* (very important). A rating of *not applicable* was not used in the calculation of the importance scale score. A *never* response received a score of 0,

and the *possibly* and *certainly* importance ratings were scored 1 and 2, respectively. Individual questions were grouped into 1 of 9 domains of health supervision and illness-focused activities, based on the overriding conceptual framework that identified each of the 9 domains (see Table 4). Each domain varied as to the numbers of questions asked of respondents. Mean frequency of performance and importance scores for each item, as well as a mean scale score for the 9 domains, were calculated for subjects who indicated employment as a PNP (n = 325). The 10 highest mean scores for frequency and importance items and mean scale scores of importance and frequency for each of the domains are identified in Tables 4 and 5. The range of individual item mean scores of frequency and importance was 3.85 to 0.12 and 1.94 to 1.09, respectively. The range of mean scale scores for frequency and importance of the domains was 3.19 to 0.85.

Mean domain scale scores were compared by key demographic variables to determine whether a particular demographic variable accounted for differences in mean scale scores of frequency and importance. The demographic variables of interest were number of years as a PNP (trichotomized into 3 categories of years of experience from 0 to 71 months, 72 to 179 months, and 180 to 327 months), type of PNP education, geographic region of practice, full-time versus part-time employment, employment setting (comparing 4 settings: solo or group with pediatrician, clinic/health center or outpatient hospital, health maintenance organization, and solo or group with physician), prescriptive privileges in state of residence, writing prescriptions, and subspecialty practice.

A one-way analysis of variance indicated a significant effect of experience level (measured in years of employment) and education for the domains of health supervision counseling frequency { $F(2, 281) = 3.97, P = .02$ } and importance { $F(2, 273) = 4.21, P = .02$ }, specialized counseling or referral importance { $F(2, 59) = 4.85, P = .01$ }, and developmental testing frequency { $F(2, 279) = 6.74, P = .00$ }. The domain of consultant-focused and referral activities importance was the only domain identified with significant differences based on PNP education { $F(3, 311) = 3.20, P = .02$ }. A post hoc comparison of groups using the Scheffé procedure was

**TABLE 4** Health supervision and illness-focused activities: mean domain scale scores for importance and frequency

Domain	M*	SD	N†
<b>Frequency</b>			
1. Prenatal anticipatory guidance	0.85	1.26	296
2. Health supervision data gathering functions	3.09	.66	316
3. Management plan for health supervision	3.13	.71	315
4. Health supervision counseling	2.91	.87	315
5. Specialized consultation or referrals	1.72	.89	310
6. Developmental, school readiness, and speech/language testing	1.03	.92	313
7. Sick-child activities and tasks	3.19	.82	315
8. Consultant-focused and referral activities	1.89	.61	316
9. In-hospital, emergency department, or prompt care unit	1.54	.99	105
<b>Importance</b>			
1. Prenatal anticipatory guidance	1.37	.53	154
2. Health supervision data gathering functions	1.81	.26	308
3. Management plan for health supervision	1.82	.27	307
4. Health supervision counseling	1.67	.35	308
5. Specialized consultation or referrals	1.67	.45	290
6. Developmental, school readiness, and speech/language testing	1.55	.49	254
7. Sick-child activities and tasks	1.85	.28	304
8. Consultant-focused and referral activities	1.68	.30	308
9. In-hospital, emergency department, or prompt care unit	1.70	.39	92

\*Maximum M frequency scale score is 4.0; maximum M importance scale score is 2.0.

†Sample size (N) = 325; variations in item N are the result of missing data.

**TABLE 5** Ten highest mean scores of frequency and importance for individual questionnaire items: health supervision and illness-focused activities and tasks

	M score*	SD	N†
<b>Frequency item</b>			
1. Evaluate growth patterns/parameters	3.85	0.61	320
2. Evaluate developmental milestones	3.81	0.73	316
3. Perform complete physical examination—health supervision	3.77	0.84	322
4. Conduct illness-focused history	3.77	0.78	322
5. Perform illness-focused regional physical examination	3.75	0.83	322
6. Elicit age-appropriate interval history—health supervision	3.74	0.87	323
7. Elicit complete health history—health supervision	3.72	0.79	326
8. Determine plan for anticipatory guidance	3.70	0.85	320
9. Prescribe over-the-counter medications	3.69	0.88	321
10. Order common laboratory tests—illness focused	3.62	1.02	323
<b>Importance item</b>			
1. Perform complete physical examination—health supervision	1.94	0.24	292
2. Perform a complete examination on newborn in hospital	1.93	0.25	70
3. Prescribe pharmacologic agents—ill child	1.93	0.25	287
4. Order common laboratory tests—illness focused	1.93	0.24	292
5. Recognize early signs of illness—health supervision counseling	1.92	0.28	283
6. Perform illness-focused regional physical examination	1.91	0.29	304
7. Order appropriate immunizations	1.91	0.29	291
8. Provide health supervision for infants aged 2-12 mo	1.91	0.28	274
9. Provide care for sick infants aged 2.1 to 12.9 mo	1.90	0.30	281
10. Elicit age-appropriate interval history—health supervision	1.90	0.31	297

\*Maximum M frequency score is 4.0; maximum M importance score is 2.0.

†Sample size (N) = 325; variations in individual item N are the result of missing data.

**TABLE 6** The effect of years of experience\* as a PNP, type of PNP education,<sup>†</sup> geographic region,<sup>‡</sup> and employment setting<sup>§</sup> on the frequency and importance of PNP activity domains and management of pediatric clinical problem categories<sup>¶</sup>

	Experience (y)	Type of education	Region	Setting
Activity domain				
Frequency of health supervision counseling	Greater with ≥15 y than with <6 y			
Importance of health supervision counseling	Greater with >15 y than with 6-14.9 y			Greater with pediatrician and physician groups than clinic/health/outpatient center
Importance of specialized consultation or referrals	Greater with >15 y than with 6-14.9 y			
Frequency of developmental, school readiness, and speech/language testing	Greater with >15 y			
Importance of consultant-focused and referral activities		Greater with masters than post masters		
Importance of anticipatory prenatal guidance			Greater for West than Northeast or Midwest	
Frequency of management plan				Greater with pediatrician group than clinic/health/outpatient center
Frequency of health supervision data gathering				Greater with pediatrician group than clinic/health/outpatient center
Pediatric clinical problem category Behavioral/psychological			Greater for Northeast and West than for Midwest	
Emergency treatment			Greater for Northeast and West than for Midwest	
Respiratory, musculoskeletal/connective tissue, genitourinary/reproductive, dermatologic, general EENT, eye, nose, throat, and infectious illnesses				Greater with pediatrician group and health maintenance offices than with health/outpatient center or other physician group
Cardiovascular, digestive, genetics, endocrine, hematologic/oncologic/immunologic, neurologic diseases, and emergency treatment				Greater with pediatrician group than other 3 groups
Ear conditions and illnesses				Less with clinic/health/outpatient center than other 3 groups

EENT, Eye, ear, nose, throat.

\*There were 3 levels of experience based on number of years employed: 0 to 71 months; 72 to 179 months; and 180 to 327 months.

<sup>†</sup>There were 4 groups of PNP educational preparation: group 1 = continuing education; group 2 = masters degree; group 3 = post masters; group 4 = other.

<sup>‡</sup>There were 4 geographic regions: group 1, Northeast; group 2, Midwest; group 3, South; and group 4, West.

<sup>§</sup>There were 4 categories of employment setting: group 1 = solo or group with pediatrician; group 2 = clinic/health/outpatient center; group 3 = health maintenance organization; group 4 = solo or group with physician.

<sup>¶</sup>Pairs of groups significantly different at  $P = .05$ .

done to identify which groups differed by years of experience and type of PNP basic education. The higher mean domain scale scores of the most experienced group of PNP's were significantly different from the lower mean scores of the other lesser experienced groups in the domains previously listed (Table 6).

To analyze the effect of part-time versus full-time employment as a PNP on domain scale scores, *t* tests for independent samples were used. Domain scale scores that were significantly different based on part-time or full-time employment status included management plan for health supervision frequency

{ $t(319) = 2.27, P = .02$ }, developmental, school readiness, and speech/language testing frequency { $t(317) = -2.07, P = .04$ }, consultant-focused and referral activities frequency { $t(320) = 3.13, P = .002$ }, and emergency tasks frequency { $t(108) = 2.54, P = .01$ }. PNP's employed full time had significantly higher mean

scale scores for 3 of the 4 identified domains than did their part-time colleagues. PNPs in part-time employment had higher mean scores than did their counterparts for the developmental, school readiness, and speech/language testing frequency domain.

Comparison of domain scores by geographic region showed a significant difference in mean scale score only for the anticipatory prenatal guidance importance domain ( $F(3, 150) = 3.87, P = .01$ ). The Western regional group had a significantly higher mean scale score (1.66) than did the Northeastern and Midwestern groups (1.30 and 1.28, respectively). Type of employment setting also was found to demonstrate significant differences in 3 domain mean scale scores when a one-way analysis of variance was computed based on 4 employment settings. Health supervision data gathering frequency ( $F(3, 261) = 5.35, P = .001$ ), management plan for health supervision frequency ( $F(3, 260) = 3.84, P = .01$ ), and health supervision counseling frequency ( $F(3, 260) = 7.68, P = .0001$ ) were the 3 domains influenced by setting. A post hoc comparison of groups was done to identify which groups differed by employment setting (see Table 6). Their higher scale scores of those in solo or group practice with a pediatrician differed significantly from the lower mean scale scores of those employed in the clinic/health center or outpatient setting in those 3 domains. In the health supervision counseling frequency domain, the health maintenance group also had significantly different mean scale score ( $M = 3.35$ ) from the clinic/health center group ( $M = 2.82$ ), the employment setting with the lowest domain mean scale score.

A comparison of mean domain scale score with state prescriptive authority, prescription writing, and subspecialty practice was performed using *t* tests for independent samples. Prescriptive authority for PNPs was found to have a significant effect on the frequency domains of health supervision counseling ( $t(319) = 2.26, P = .02$ ) and sick child activities ( $t(63.20) = 2.08, P = .04$ ). The PNPs at the time of this study who lived in a state that allowed prescriptive privileges for PNPs had significantly higher mean scale scores in these two frequency domains than did the PNPs who lived in a state that did not allow such privileges.

Similarly, if PNPs identified that they prescribed prescriptive medications to patients, they had significantly higher mean scale scores for the domains of health supervision data gathering frequency ( $t(47.20) = 3.73, P = .001$ ), management plan for health supervision frequency ( $t(47.65) = 3.99, P = .000$ ), health supervision counseling frequency ( $t(48.29) = 3.35, P = .002$ ), sick child activities frequency ( $t(42.26) = 7.15, P = .000$ ) and importance ( $t(39.22) = 2.93, P = .006$ ), and consultant-focused and referral frequency ( $t(51.20) = 5.61, P = .000$ ). As expected, the group with the higher domain mean scale scores were the PNPs who prescribed prescriptive medications.

health supervision ( $t(106.89) = -5.92, P = .000$ ); health supervision counseling ( $t(104.53) = -7.33, P = .000$ ); developmental, school readiness, and speech and language testing ( $t(156.25) = -3.41, P = .001$ ); sick-child activities ( $t(319) = -2.32, P = .021$ ); and consultant-focused and referral activities ( $t(320) = -6.03, P = .000$ ). The mean scale scores in those domains were significantly lower than the scores of their colleagues without subspecialty practice.

**Pediatric Clinical Problems: Individual and Mean Scale Scores by Category of Pediatric Disease or Problem**

Subjects were given an extensive list of 303 clinical problems seen in children. They were asked to rate the highest level of patient care responsibility they would have in the assessment and management of an uncomplicated patient with the identified clinical problem. The 5 levels of responsibility were based on the PNP assessing and managing the care of a pediatric patient with or without physician input. The levels were (1) would never see a patient with this problem, (2) would immediately refer a patient with this problem to the physician, (3) would provide an assessment of the patient and then refer the patient to the physician for management, (4) would assess and then manage the patient's care only after consulting with the physician, and (5) would assess and manage the patient by oneself based on PNP or office protocol. If a child with a particular disease or condition would never be seen by the PNP, the item was given a score of 0. Immediate referral received a score of 1; "assess and then refer to physician" received a 2; "assess and then manage after physician consultation" received a 3; and "assess and manage by PNP only" received a 4, the highest score possible.

Mean level of responsibility scores were obtained for each clinical condition. The 10 highest mean scores were upper respiratory infection ( $M = 3.75, SD = 0.88$ ), constipation ( $M = 3.69, SD = 0.89$ ), contact dermatitis ( $M = 3.69, SD = 0.87$ ), acute otitis media ( $M = 3.68, SD = 0.86$ ), impetigo ( $M = 3.67, SD = 0.89$ ), allergic rhinitis ( $M = 3.66, SD = 0.95$ ), oral candidiasis ( $M = 3.65, SD = 0.92$ ), pharyngitis—viral and bacterial ( $M = 3.65, SD = 0.91$ ), atopic dermatitis ( $M = 3.64, SD = 0.91$ ), and serous otitis media ( $M = 3.63, SD = 0.96$ ).

**Key demographic findings of this study that are worthy of note are the aging of the PNP population (two thirds of the subjects are middle-aged) and the migration of PNPs into prompt care settings, emergency departments, and inpatient settings (10% of the study population).**

Significant differences existed in the domain mean scale scores of the PNPs in subspecialty practice compared with their counterparts who did not list a specialty practice area. Only frequency mean scale scores were affected by subspecialty practice and included the following domains: anticipatory guidance prenatal visit ( $t(177.96) = -3.05, P = .003$ ); health supervision data gathering ( $t(108.22) = -5.62, P = .000$ ); management plan for

**TABLE 7** The effect of employment settings\* on the level of management responsibility for pediatric clinical problems

Source of variation	Sum of squares	df	Mean squares	F	Significance of F
Category of disease/condition					
Respiratory					
Between groups	19.82	3	6.60	12.56	.0000
Within groups	136.69	260	0.52		
Cardiovascular					
Between groups	10.32	3	3.44	7.16	.0001
Within groups	124.83	260	0.48		
Digestive/abdominal					
Between groups	9.55	3	3.18	6.24	.0004
Within groups	132.61	260	0.51		
Musculoskeletal/connective tissue					
Between groups	23.76	3	7.92	11.35	.0000
Within groups	179.21	260	0.69		
Genitourinary/reproductive					
Between groups	17.42	3	5.80	8.27	.0000
Within groups	182.59	260	0.70		
Hematologic/oncologic/immunologic					
Between groups	13.17	3	4.39	6.91	.0002
Within groups	163.69	258	0.63		
Dermatologic					
Between groups	21.04	3	7.01	11.74	.0000
Within groups	154.71	259	0.59		
Endocrine					
Between groups	10.82	3	3.60	4.59	.004
Within groups	200.26	255	0.78		
General EENT					
Between groups	9.86	3	3.28	11.74	.0002
Within groups	125.41	259	0.48		
Eye					
Between groups	21.38	3	7.12	11.47	.0000
Within groups	159.11	256	0.62		
Ear					
Between groups	14.11	3	4.70	9.26	.0000
Within groups	131.98	260	0.50		
Nose					
Between groups	16.63	3	5.54	9.06	.0000
Within groups	159.03	260	0.61		
Throat					
Between groups	14.95	3	4.98	7.13	.0001
Within groups	181.62	260	0.69		
Genetics					
Between groups	11.86	3	3.95	3.62	.01
Within groups	282.85	259	1.09		
Infectious					
Between groups	18.74	3	6.24	8.87	.0000
Within groups	183.08	260	0.70		
Neurologic					
Between groups	14.51	3	4.83	6.99	.0002
Within groups	179.86	260	0.69		
Emergency treatment					
Between groups	19.77	3	6.59	6.79	.0002
Within groups	251.12	259	0.96		

EENT, Eye, ear, nose, and throat.

\*There were 4 categories of employment setting: group 1 = solo or group with pediatrician; group 2 = clinic/health center or outpatient; group 3 = health maintenance organization; group 4 = solo or group with physician.

Pediatric clinical problems then were grouped into 14 areas by category of disease entity. The number of clinical problems in each of the 14 categories varied from a high of 39 items in the infectious and eye, ear, nose, and throat (EENT) sections to a low of 9 items in the emergency treatment section. Level of management responsibility mean scale scores for the 14 categories were calculated for subjects. The EENT category was subdivided further to investigate possible effect of the individual components (eye, ear, nose, and throat) on this general category.

Category mean scale scores also were compared with key variables to determine whether a particular variable accounted for significant differences in mean scale scores of the level of management responsibility. The variables of interest were number of years as a PNP (trichotomized into 3 categories of years of experience from 0 to 71 months, 72 to 179 months and 180 to 327 months), type of PNP education, type of employment setting, geographic region, full-time versus part-time employment, prescriptive privileges, writing prescriptions, and subspecialty practice.

A one-way analysis of variance with years of experience as a PNP again in trichotomized categories showed no significant differences in mean scale scores for any of the 14 categories, as well as the individual components of the EENT category. Similarly, type of PNP educational preparation showed no significant difference in categorical mean scale scores in one-way analysis of variance testing. Type of employment setting—solo or group with pediatrician, clinic/health center or outpatient, health maintenance organization, or solo or group with physician—had a significant effect ( $P \leq .01$ ) on all categorical mean scale scores of management responsibility except for the behavioral/psychologic category ( $P > .05$ ) (see Table 7).

A post hoc comparison of groups using the Scheffé procedure was done to identify which employment groups differed in their mean scores of management responsibility. PNP's in pediatrician offices and health maintenance offices were more likely than those in other physician offices or clinic/health center or outpatient centers to manage respiratory, musculoskeletal/connective tissue, genitourinary/reproductive dermatologic, general EENT, eye, nose



**TABLE 8** The effect of prescriptive authority, writing for prescription medication, and subspecialty practice on the level of management responsibility for pediatric clinical problems by disease or condition category: *t* tests for independent samples

Category	Factor	<i>t</i> value	<i>df</i>	<i>P</i>	Category	Factor	<i>t</i> value	<i>df</i>	<i>P</i>
Respiratory	Prescriptive authority	3.28	317	.001	Ear	Prescriptive authority	2.65	58.67	.010
	Write prescriptions	7.82	315	.000		Write prescriptions	7.19	313	.000
	Subspecialty practice	-5.38	102.87	.000		Subspecialty practice	-5.20	95.24	.000
Cardiovascular	Prescriptive authority	0.72	61.92	NS	Nose	Prescriptive authority	3.04	58.35	.004
	Write prescriptions	3.74	314	.000		Write prescriptions	4.84	43.57	.000
	Subspecialty practice	-3.99	110.41	.000		Subspecialty practice	-5.94	88.98	.000
Digestive/ abdominal	Prescriptive authority	2.01	62.79	.049	Throat	Prescriptive authority	3.21	58.71	.002
	Write prescriptions	5.76	46.47	.000		Write prescriptions	5.69	43.82	.000
	Subspecialty practice	-3.97	104.96	.000		Subspecialty practice	-5.13	96.97	.000
Musculoskeletal/ connective tissue	Prescriptive authority	2.30	58.72	.025	General EENT	Prescriptive authority	3.24	56.73	.002
	Write prescriptions	5.60	311	.000		Write prescriptions	4.62	41.92	.000
	Subspecialty practice	-5.87	98.85	.000		Subspecialty practice	-5.00	89.14	.000
Genitourinary/ reproductive	Prescriptive authority	2.47	59.11	.016	Genetic disease	Prescriptive authority	0.48	315	NS
	Write prescriptions	6.84	314	.000		Write prescriptions	2.06	311	.040
	Subspecialty practice	-4.42	104.74	.000		Subspecialty practice	-2.16	313	.032
Hematology	Prescriptive authority	1.15	61.91	NS	Behavioral/ psychological	Prescriptive authority	2.53	62.76	.014
	Write prescriptions	5.24	312	.000		Write prescriptions	3.35	313	.001
	Subspecialty practice	-3.01	108.75	.003		Subspecialty practice	-5.34	110.75	.000
Dermatology	Prescriptive authority	3.11	58.20	.003	Infectious Disease	Prescriptive authority	2.87	63.14	.006
	Write prescriptions	5.99	44.54	.000		Write prescriptions	7.04	314	.000
	Subspecialty practice	-6.33	90.43	.000		Subspecialty practice	-5.03	103.14	.000
Endocrinology	Prescriptive authority	1.79	61.98	NS	Neurology	Prescriptive authority	1.53	62.56	NS
	Write prescriptions	4.39	307	.000		Write prescriptions	4.22	315	.000
	Subspecialty practice	-3.73	107.14	.000		Subspecialty practice	-4.52	113.12	.000
Eye	Prescriptive authority	2.45	56.42	.018	Emergency/ treatment	Prescriptive authority	2.55	315	.011
	Write prescriptions	6.34	308	.000		Write prescriptions	3.62	313	.000
	Subspecialty practice	-5.70	97.09	.000		Subspecialty practice	-5.19	114.34	.000

EENT, Eye, ear, nose, throat.

throat, and infectious illnesses or conditions. PNPs in pediatrician offices were more likely than the other 3 employment groups to manage cardiovascular, digestive, genetics, endocrine, hematologic/oncologic/immunologic, and neurologic diseases and emergency treatments. PNPs in clinic/health centers or outpatient centers were less likely to manage ear conditions and illnesses than were PNPs in the other 3 employment settings.

Comparison of category mean scale scores in one-way analysis of variance identified two categories that differed significantly with geographic region (Table 6). These categories were the behavioral/psychological ( $F(3, 307) = 6.89, P = .0002$ ) and emergency treatment categories ( $F(3, 307) = 6.65, P = .0002$ ). In a post hoc comparison, the higher mean level of responsibility scale scores of the Northeastern and Western respondents differed significantly from the Midwest-

ern group, which had the lowest mean scale scores.

To analyze the effect of part-time versus full-time employment as a PNP on category scale scores, *t* tests for independent samples were used. The only category mean scale score that was significantly different based on part-time or full-time employment status was neurologic ( $t(317) = 2.25, P = .03$ ). PNPs employed full time had a significantly different higher mean scale score for this category than did their colleagues who worked part time.

Living in a state that gives PNPs prescriptive authority in their state nurse practice regulations, prescribing prescriptive medications, and practicing as a PNP in a subspecialty area were factors that significantly influenced the level of management responsibility. A comparison of groups using *t* tests for independent samples was computed; results are found in Table 8. Writing

prescriptions and subspecialty practice produced significant differences ( $P < .05$ ) in management mean scores for all disease categories. Prescriptive authority also was associated with significant differences in management scores in all categories except for the areas of hematology, endocrinology, genetics, and neurology.

A total of 267 respondents indicated that they had prescriptive authority under their state nurse practice regulation. Another 9 subjects indicated that they wrote prescriptions but did not have prescriptive authority in their state; thus, the number of persons in the group that wrote prescriptions totaled 276. These two items basically appeared to measure the same loading factor, that is, the ability to write a prescription in one's work setting. Mean scale scores for level of management responsibility were significantly higher for PNPs who either had prescriptive authority or wrote prescrip-

**TABLE 9** Five most frequently listed professional activities performed by PNP's as part of either their work role or outside commitment (N = 325)

Item	n
<b>Professional work-related task or activity</b>	
Collaboration with other professionals to meet patient needs	317
Maintain professional competency—enroll in academic or continuing education course work	300
Certify required paperwork for government assistance programs	286
Mentor for students (eg, nurse practitioner, medical residents)	282
Participate at least annually in professional meetings—pediatric focus	250
<b>Professional outside of employment activity</b>	
Maintain professional competency—enroll in academic or continuing education course work	247
Participate at least annually in professional meetings—pediatric focus	231
Participate in community needs/service projects	202
Collaborate with other professionals to meet patient needs	148
Legislative efforts—focus on pediatric or related professional issues	146

tions than were the scores of their counterparts. Management of all categories of clinical problems was greater when PNP's had prescriptive authority except for cardiovascular, hematology, endocrine, genetic, and neurologic problems, which are reasonable exceptions. PNP's who wrote prescriptions managed all of the categories of conditions more often than did PNP's who did not write prescriptions, and PNP's who were not in subspecialty practices managed all of these conditions more often than did subspecialty PNP's.

**Professional Role Responsibilities: Mean Scores**

Questions about professional role responsibilities also were asked on the PNP Role Delineation Questionnaire. Subjects were asked whether they were involved in specific activities or tasks as part of their professional role in either their work setting or outside of their employment setting. A total of 21 questions comprised this section of the questionnaire. Subjects were asked for a simple "yes" or "no" response as to whether the activity was performed as part of one's work setting responsibilities. Similarly, subjects were to answer "yes" or "no" if they engaged in the activity as part of their outside of work commitments. Thus, the same 21 questions were repeated twice for a total of 42 possible responses. The five most frequent items identified as part of either work or outside of work professional role responsibilities are listed in Table 9.

Cross-tabulations of responses between professional role function done in the work setting and performed as part of a professional commitment outside of the work setting were performed. For all but 3 items, related professional employment role and professional outside-of-work role activities and tasks were answered differently. Mentoring of students, maintaining professional competency by enrolling in academic or continuing education course work, and participating at least annually in professional meetings were activities that subjects did as part of both their work and outside-of-work professional responsibilities.

The only other comparison of data collected in this section of the questionnaire involved investigating the effect of educational preparation on professional role responsibility. Chi square analysis of professional work role responsibilities by type of PNP educational preparation revealed significant findings in critically evaluating and applying research findings to clinical practice,  $\chi^2 (3, N = 319) = 8.47, P = .037$ ; conducting or collaborating in basic or applied research,  $\chi^2 (3, N = 317) = 12.94, P = .004$ ; and participating in statistical record keeping for the clinical practice setting,  $\chi^2 (3, N = 319) = 10.66, P = .013$ . Cross-tabulations of professional role responsibilities outside the employment setting revealed significant findings in critically evaluating and applying research findings to clinical practice,  $\chi^2 (3, N = 286) = 12.86, P = .004$ ; main-

taining professional competency by enrollment in academic course work or continuing education programs,  $\chi^2 (3, N = 284) = 8.46, P = .037$ ; and participating at least annually in local, state, or national meetings of professional organizations,  $\chi^2 (3, N = 291) = 8.81, P = .031$ . Master's-prepared respondents reported greater participation in these activities than did respondents prepared in continuing education or post masters' programs.

**DISCUSSION AND IMPLICATIONS**

Key demographic findings of this study that are worthy of note are the aging of the PNP population (two thirds of the subjects are middle-aged) and the migration of PNP's into prompt care settings, emergency departments, and inpatient settings (10% of the study population). The replacement of these middle-aged PNP's as they enter retirement years is an issue that should be addressed on the national level both by professional and educational organizations. Close monitoring of supply and demand issues related to PNP's in the health care delivery arena is needed, and a plan needs to be developed that addresses the supply and demand needs in the health care market during the next two decades. Furthermore, more detailed studies are needed to investigate the role of PNP's in emergent care settings (prompt care and emergency departments) and inpatient units. Data about their involvement in the delivery of primary and/or intensivist care will assist nurse educators and certification bodies to identify whether (and, if yes, how) the role of these PNP's is significantly different from their counterparts in primary care settings.

The NCBPNP/N is in the process of updating its test framework for the PNP national qualifying examination (NQE) based on data from this study about the primary care activities (health supervision and illness management), the level of management responsibility, and the types of pediatric conditions/illnesses being managed by PNP's. The question bank of the NQE is being analyzed to ensure currency and relevancy of all test questions and that the weighting of items about various health supervision and illness management activities tested in the NQE is proportionate to current PNP practice activities. National certification organizations must revisit their test questions and framework on a

scheduled time line because health care roles are dynamic and often in flux. Health care knowledge and technology are rapidly and dramatically changing the roles of all health professionals, not just PNP's.

The effect of years of experience on the frequency and importance of health supervision counseling was interesting. PNP's with more than 15 years' experience reported doing health supervision counseling more often and believed it to be more important to their job than did PNP's with less than 6 years of experience. This finding is easy to explain: with experience as a PNP comes wisdom in recognizing the importance of the counseling role, and more efforts are made to counsel patients and their families. However, this finding points out the need to mentor new graduates about how best to implement counseling activities into their busy practices. PNP educators should address this issue more strongly in practicum experiences.

The negative effect of living in the Midwest on health supervision and illness-focus domains and the level management scores found in this study is most likely related to more restricted nurse practice regulations, particularly the lack of prescriptive authority at the time the study was conducted. PNP's should be vigilant in monitoring their nurse practice acts for any forces or changes that might have a negative impact on advanced nurse practice regulations. In particular, the right to prescriptive authority for nurse practitioners needs to be safeguarded because of its significant effect on the level of management responsibility and the type of activities in which PNP's can engage. Shortly after this study was completed, additional states expanded and granted prescriptive authority to NPs, which should result in a lessened or no regional effect on PNP activities and level of management responsibility.

The finding that practice in an office setting with a pediatrician was associated with a greater level of management responsibilities for the treatment of pediatric conditions and illnesses was not surprising. One would expect PNP's who work in solo practice or small group settings with pediatricians to develop close collegial working relationships. It would not be unusual for these settings to have a more uniformed, practiced-based approach to disease management for children that would allow PNP's greater participation in the management plan. The difference in setting responsibility has implications for educational training. Students should be exposed to a variety of settings in their clinical practicum to learn the various management roles that PNP's assume.

**Mentorship and participation in community needs/service projects were unexpected activities listed in the top 5 most frequently identified work-related and outside-of-work activities.**

Respondents in subspecialty practice had a lower level of management responsibility for pediatric diseases. This finding was not unexpected but had implications for the education of subspecialty PNP's. It may be that these sub-

specialty PNP's function more as clinical nurse specialists than as primary care providers in a subspecialty setting. Again, it would be important to investigate the activities and role of subspecialist PNP's in more detail to determine how much of their primary care education and background is used in their practice and what level of subspecialty training and education is needed.

During the piloting of the survey questionnaire, PNP's talked about their involvement in other patient-related professional commitments. Because these activities or commitments seemed important to PNP's, information was sought about certain professional work-related and outside employment activities. Mentorship and participation in community needs/service projects were unexpected activities listed in the top 5 most frequently identified work-related and outside-of-work activities. As was expected, level of educational preparation had a significant effect on critically evaluating and applying research findings to clinical practice. Research-based practice and research studies have tremendous implications for professional recognition of the PNP role by other health care professionals. Promotion of research is a role that all PNP's must value and support.

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