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Health Problems Encountered by Nurse Practitioners and Physicians in Family Practice Clinics[1]

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Effects of specialty, setting, and provider group on the distribution of health problems encountered by nurse practitioners and physicians in four specialties—namely, obstetrics-gynecology, general/adult medicine, pediatrics, and family practice—were studied (Chen, Barkauskas, Ohlson, & Chen, 1982). In all four specialties the distribution of health problems identified by both nurse practitioners and physicians was found to be affected.

The purpose of this article is to examine in detail the distribution of health problems by setting and provider group in the specialty of family practice. Reports published elsewhere have described the findings for the obstetric-gyneocologic, general medicine, and pediatric specialties (Barkauskas, Chen, Chen, & Ohlson, 1981; Chen, Barkauskas, Ohlson, Chen, & DeStefano, 1983; Chen, Barkauskas, & Chen, 1984).

Previous studies have used various methodologies to describe the practice of family nurse practitioners. Pesznecker and Draye (1978)

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surveyed a self-selected sample of 356 family nurse practitioners, who reported 8,905 patient encounters from February through April, 1977. Results indicated that the most frequently encountered health problems were benign hypertension, general medical examination, acute nasopharangitis, acute pharyngitis, and well-child care. Approximately 20% of the encounters were for preventive and health promotion purposes, and 55.4% of all encounters were for the 15 most frequently encountered health problems. Schwartz (1979) studied family nurse practitioner and physician practices in three types of community-based practices. Differences between nurse practitioner and physician case loads in patient characteristics and diagnoses were observed within and among the practices. Family nurse practitioner case loads included proportionately more children and females and fewer elderly than did the physicians' case loads. Overall, family nurse practitioners saw a larger percentage of patients for preventive purposes (39.3%) than did the physicians (17.4%). A number of differences were noted among nurse practitioner case loads in the three types of community-based settings. These differences reflected practitioner preferences, case load characteristics, and practice organization.

Additional published reports contain general descriptions of family nurse practitioner practices (Sultz, Zielezny, & Gentry, 1980; Ward, 1979; Yodfat, Fidel, & Eliakin, 1977). However, previous studies have contained important methodological limitations, including short data collection periods and self-report. These methodological deficits have been corrected in the current study. In addition, the study includes comparisons of family nurse practitioner and physician practices in both community-based and hospital-based settings.

Various terms need definition in the context of this study. A health problem is defined as an uncertainty, need, or difficulty related to the health status of an individual and/or family, the nature of which may be physiological, psychosocial, or environmental. A family nurse practitioner (FNP) is a registered nurse working in collaboration with a physician to provide primary health care to patients. The educational preparation of the nurse practitioner includes learning physical assessment skills and independent and collaborative judgment skills in the health care management of patients (U.S. Dept. of Health, Education, and Welfare, 1971, p. 9). A patient visit is a person-to-person contact between a patient and the provider having primary responsibility for managing the patient's health problems during that visit.

METHOD

The method of studying the four specialties was described in Chen et al. (1982). This section presents specific information related to the family practice specialty.

Population and Sample

The population consisted of 8,347 patient visits made to four family practice clinics between March 1978 and June 1978. The number of sampled patient visits was 870 for family nurse practitioners and 2,706 for physicians. The four clinics were identified through a survey of ambulatory care clinics in Cook County, Illinois (Chen et al., 1982). The process of clinic selection is described below.

From August through October 1977, three hospital-based outpatient clinics and two community-based clinics in Cook County employed family nurse practitioners and physicians. The three hospital-based clinics met the criteria for selecting clinics and participated in the study. Of the two community-based clinics, one participated in the study. The other was excluded because the family nurse practitioner did not function fully in a nurse practitioner role. Thus a total of four clinics—three hospital-based and one community-based—participated in the study. Each clinic is described below.

Clinic 14 is one of five satellite clinics administered by a small, private, community hospital with approximately 150 beds. The hospital provides medical services to patients of all ages through two types of payment mechanisms: a prepaid plan and a fee-for-service arrangement. Most of the prepaid enrollees are welfare recipients. The clinic was staffed by one part-time nurse practitioner and four part-time physicians from February through June 1978. The nurse practitioner was trained in a 14-week program given by the community hospital. The agency provides approximately 15,400 patient visits per year.

Clinic 54 is a family practice clinic in the outpatient department of a large government hospital with approximately 1,400 beds. From February through June 1978 the clinic employed one full-time FNP and 15 full-time and part-time physicians. The clinic serves a predominantly low-income population and provides approximately 11,000 patient visits per year. The nurse practitioner was prepared in a program spon-

sored by the employing institution. A large medical residency training program is affiliated with the clinic.

Clinic 64 is a family practice clinic in a large, general, community hospital with approximately 900 beds. At the time of data collection the clinic employed one part-time nurse practitioner, four full-time physicians, and an unknown number of residents. The clinic serves a low- to middle-income population and has approximately 6,000 patient visits per year. The FNP held a master's degree, but was prepared as an FNP while in her position. The agency has a large medical residency training program.

Clinic 74 is a family practice clinic in the outpatient department of a large community hospital with approximately 700 beds. At the time of data collection the clinic employed two full-time nurse practitioners and 18 full-time and part-time physicians and residents. The clinic serves a predominantly middle-income population and provides approximately 15,000 patient visits per year. The two nurse practitioners were prepared in a master's degree program. A large medical residency program is affiliated with this clinic.

When investigators attempted to document methods of patient assignment, none of the personnel in the four clinics could describe a deliberative or systematic pattern for assigning patients to provider groups. Investigators believe that informal patient assignment and triage methods are operating in all clinics.

Measure

Basic encounter data and health problem statements were transferred from the patient's chart to an encounter form as described in Chen et al. (1982).

Procedure

Training of data collectors, sampling of patient visits, verifying accuracy of data, and coding are described in Chen et al. (1982).

Encounter Data

The number of patient visits to providers ranges from 209 to 274, with a median of 245, for the FNPs in the four clinics, and from 487 to 2,415,

with a median of 2,236, for the physicians in the same four clinics during an 18-week period from February 27 to June 30, 1978. The percentage of patient visits to the FNP in the one community-based clinic is 10.3% of the 2,419 visits. The percentage of patient visits to the FNPs in the three hospital-based clinics is 12.2% of the 5,928 visits. A summary of the patient encounter data and the results of the statistical tests are shown in Table 1.

Race distribution differs between provider groups in Clinics 54 and 64. In Clinic 54, which serves a predominantly black population, the FNP group encounters proportionately more black patients than does the physician group. In Clinic 64, which serves a predominantly white population, the FNP group encounters proportionately more white patients then does the physician group.

Sex distribution differs significantly between FNP and physician groups in Clinics 14 and 64. In these two clinics the FNPs encounter proportionately more female patients than do the physicians.

Age distribution of patient visits seen by the FNP and physician groups differ significantly in all four clinics. The nurse group in each of the four clinics encounters proportionately fewer visits made by persons 65 years or older than does the physician group in the same clinic. In Clinic 14, the nurse handles proportionately more patient visits than the physicians for the age groups of 1 to 4 and 10 to 19, and less for the age group of 45 to 64. The nurse in Clinic 64 handles proportionately fewer patient visits for the age groups of 5 to 9 and 45 to 64 than does the physician group in the same clinic. The nurse group in Clinic 74 handles proportionately more patient visits by persons less than 1 year of age, from 5 to 9 years, and from 10 to 19 years than the physician group in that clinic.

Distribution of visits by new and returning patients does not differ significantly between the two provider groups, except in Clinic 54. This clinic has a low percentage of new patients, and the physician group manages proportionately more of them.

The number of health problems on each Patient Encounter Form ranges from 1 to 8. The average number of health problems per encounter ranges from 1.2 to 1.7 for the FNP group, and from 1.2 to 2.3 for the physician group.

All Health Problems

For each provider group, all health problems were grouped into the 19 three-digit headings of ICD-9-CM. Chi-square tests indicate that the

TABLE 1 Summary of Patient Encounter Data for Family Nurse Practitioners and Physicians

	Community-Based				*Hospital-Based*			
	Clinic 14		*Clinic 54*		*Clinic 64*		*Clinic 74*	
Variables	*NP*	*MD*	*NP*	*MD*	*NP*	*MD*	*NP*	*MD*
No. of records obtained	240	791	209	656	206	486	215	773
% of total visits sampled	96.8	36.4	86.4	28.5	98.6	99.8	78.5	32.0
Total No. of health problems	294	964	364	1,505	251	636	287	1,095
Avg. No. of health problems per record	1.2	1.2	1.7	2.3	1.2	1.3	1.3	1.4
Race (in %)[a]			**	**	**	**		
White	15.2	20.9	1.9	7.4	89.8	69.1	89.7	93.1
Black	81.7	76.9	96.6	90.3	5.1	23.9	0.0	0.1
Other	3.1	2.3	1.4	2.2	5.1	6.9	10.3	6.7
Sex (in %)[a]	**	**			**	**		
Male	22.1	36.0	29.2	29.1	22.3	38.1	36.3	29.4
Female	77.9	64.0	70.8	70.9	77.7	61.9	63.7	70.6

Age (in %)	**	**	*	*	*	*	*	*
under 1	2.5	1.3	1.4	2.7	5.3	4.9	11.6	7.8
1-4	12.5	3.1	4.3	3.7	7.3	4.9	7.4	6.2
5-9	4.6	3.1	1.9	1.1	1.5	4.3	6.5	3.4
10-19	24.2	10.1	7.7	7.9	11.2	10.9	14.0	10.6
Subtotal for youth	43.8	17.6	15.3	15.4	25.3	25.0	39.5	28.0
20-44	45.4	47.5	33.0	29.3	67.5	59.3	40.9	45.8
45-64	10.4	26.7	44.0	38.6	6.8	12.1	14.4	17.3
65+	0.4	8.2	7.7	16.6	0.5	3.5	5.1	8.9
Subtotal for adults	56.2	82.4	84.7	84.5	74.8	74.9	60.4	72.0
Type of Patients (in %)[a]			*	*				
New to clinic	14.2	11.5	3.3	7.8	15.0	21.4	15.8	19.1
Return to clinic	85.8	88.5	96.7	92.2	85.0	78.6	84.2	80.9

a. Chi-square values are available from the investigators upon request.

*$p < .05$ using single chi-square test.

**$p < .05$ using four simultaneous chi-square tests.

distribution of health problems identified by FNPs and physicians within the same clinic differs significantly; that is, all four p values are less than .005. All health problems are further analyzed in the following classifications (see Table 2).

Frequently reported health problems are those having a 2% or greater frequency noted in at least one provider group among the four clinics. There are 32 health problems in this group. Table 3 presents ICD-9-CM codes, specifications, and percentage distributions by setting and provider group.

The community-based FNP group has 82.7% of the health problems it encountered concentrated in the 32 frequently reported items in contrast to 63.5% for the hospital-based FNP groups (see Table 2). The five most frequently reported health problems for the community-based FNP group represent 58.4% of all health problems, including obesity (28.6%), health maintenance of infant/child (12.3%), general medical examination (6.9%), hypertension (6.3%), and consultation without complaint (4.3%). For the hospital-based FNP groups, the five most frequently reported health problems total 28.6% of all health problems, including hypertension (10.0%), normal pregnancy (6.9%), health maintenance of infant/child (4.1%), URI unspecified (3.9%), and general medical examination (3.7%). Health problems of prophylactic vaccinations, respiratory/chest symptoms, osteoarthritis, inflammatory diseases of the ovaries and tubes, asthma, and strep sore throat/scarlet fever are observed in the hospital-based clinics, but not in the community-based clinic.

The community-based physician group has 54.4% of all the health problems it encountered concentrated in the 32 frequently reported items, and the hospital-based groups have 53.4%. For the community-based physician group, the five most frequently reported health problems total 25.5% of all health problems, including hypertension (8.2%), unspecified URI (7.6%), anxiety (3.4%), diabetes mellitus (3.3%), and visit for administrative purpose (3.0%). For the hospital-based physician group, the five most frequently reported health problems total 27.6% of all health problems encountered, including hypertension (7.8%), general medical examination (6.6%), normal pregnancy (5.7%), diabetes mellitus (3.9%), and obesity (3.6%). Prophylactic immunization and trichmoniasis are noted in hospital-based, but not in community-based encounters.

Occasionally reported health problems include those encountered by both provider groups, excluding the frequently reported ones. This category consists of 127 types of health problems seen on the average of

TABLE 2 Percentage Distribution of Types of Health Problems by Setting and Provider Group, Family Practice

	Community-Based (Nc = 1)[a]				*Hospital-Based (Nc = 3)*[a]			
	FNP (N = 301)[b]		*MD (N = 2,642)*[b]		*FNP (N = 1,023)*[b]		*MD (N = 10,541)*[b]	
Groups of Health Problems	*Types of Health Problems*	*%*	*Types of Health Problems*	*%*	*Types of Health Problems*	*%*	*Types of Health Problems*	*%*
Frequently reported health problems	32	82.7	32	54.4	32	63.5	32	53.4
Occasionally reported health problems	127	16.7	127	32.4	127	34.0	127	36.8
Reported by one group only	2	0.6	82	13.2	19	2.5	108	9.8
Total	161	100.0	241	100.0	178	100.0	267	100.0

a. *Nc* denotes number of clinics.
b. *N* denotes weighted frequency.

TABLE 3 Percentage Distribution of Frequently Reported Health Problems by Setting and Provider Group, Family Practice

ICD-9-CM Code	*Specification*	*Community (Nc = 1)*[a] *FNP (N = 301)*[b]	*Community (Nc = 1)*[a] *Physician (N = 2,642)*[b]	*Hospital (Nc = 3)*[a] *FNP (N = 1,023)*[b]	*Hospital (Nc = 3)*[a] *Physician (N = 10,541)*[b]
278	Obesity	28.6	2.9	2.2	3.6
V20	Health maintenance infant/child	12.3	0.1	4.1	3.2
V70	General medical exam	6.9	1.3	3.7	6.6
401	Hypertension	6.3	8.2	10.0	7.8
V65	Consultation without complaint	4.3	0.3	0.5	0.1
V25	Contraceptive management	3.3	2.5	3.2	1.5
250	Diabetes mellitus	3.0	3.3	2.4	3.9
465	URI, unspecified	2.4	7.6	3.9	1.5
616	Inflammatory disease, cervix, and vagina	2.4	1.9	3.4	0.5
V68	Administrative purposes	2.4	3.0	0.9	0.2
V67	Follow-up exam	2.0	1.9	2.1	2.5
382	Otitis media, unspecified	1.3	0.6	2.5	0.4
V72	Special exams	1.3	1.9	0.6	0.3
V22	Normal Pregnancy	1.0	1.1	6.9	5.7
131	Trichomoniasis	0.7	0.0	0.6	0.2
300	Neurotic conditions, anxiety	0.7	3.4	0.3	0.9
466	Acute bronchitis	0.7	2.3	0.5	0.4
796	Other abnormal findings (including high blood pressure)	0.7	0.5	2.0	3.2
460	Acute nasopharyngitis (cold)	0.3	0.3	1.3	0.3
462	Acute pharyngitis	0.3	1.4	1.9	0.4
599	Other disorders, urinary tract	0.3	2.5	0.8	1.2
623	Noninflammatory disease of cervix, and vagina	0.3	0.5	0.5	0.3
782	Skin symptoms	0.3	0.8	0.9	1.2
784	Head and Neck Symptoms	0.3	0.7	1.3	1.3
789	Abdominal/pelvic symptoms	0.3	0.9	1.2	1.4
V58	Aftercare, unspecified	0.3	0.5	0.9	0.3
034	Strep sore throat/scarlet fever	0.0	0.1	0.8	0.3
493	Asthma	0.0	2.2	0.2	1.0
614	Inflammatory disease of ovary/tubes	0.0	0.3	1.0	0.1
715	Osteoarthritis/related conditions	0.0	0.7	0.5	1.3
786	Respiratory/chest symptoms	0.0	0.7	1.7	1.6
V06	Prophylactic vaccinations/ combined diseases	0.0	0.0	1.1	0.4
	Subtotal (32 items)	82.7	54.4	63.5	53.4
	Other health problems[c]	17.3	45.6	36.5	46.6
	Total	100.0	100.0	100.0	100.0

a. *Nc* denotes number of clinics.
b. *N* denotes weighted frequency.
c. Includes occasionally reported health problems and health problems by one provider group only.

less than once per week (Table 2). It constitutes 32.4% of the 2,642 health problems seen by the physicians in community-based clinic and 36.8% of the 10,541 seen by physicians in hospital-based clinics. For the FNP groups, the same 127 types of health problems constitute 16.7% of the 301 health problems seen in the community-based clinic and 34.0% of the 1,023 health problems seen in the hospital-based clinics.

Health problems seen by one provider group only are those identified by either the FNP or physician group only. The percentages for health problems seen by each provider group *only* are generally very small. Physicians in the community-based clinic encounter 82 types of health problems seen only by them, constituting 13.2% of the 2,642 health problems, whereas the physicians in hospital-based clinics encounter 108 types of health problems seen only by them, constituting 9.8% of the 10,541 health problems (Table 2). The FNP in the community-based clinic identifies two types of health problems seen by nurses only, constituting 0.6% of 301 health problems, whereas the FNPs in hospital-based clinics identify 19 types of health problems seen by nurses only, constituting 2.5% of 1,023 health problems. The two lists of one provider group only problems consist primarily of uncommon physical problems scattered among 11 to 15 categories of the ICD-9-CM codes. A few examples are fracture of ankle, sprained/strained elbow and forearm, and special screening for viral diseases.

Health Problems with V Codes

Health problems with V codes denote those problems not directly related to diseases or injuries according to ICD-9-CM. Because health promotion and maintenance are important functions of nurse practitioners, health problems with V codes deserve special attention in the analysis (see Table 4).

Within the community-based clinic, the percentage of health problems with V codes seen by the FNP (37.9%) differs substantially from the percentage seen by physicians (14.8%). Within the hospital-based clinics the difference is smaller: 26.5% for the FNPs and 23.1% for the physicians. Health maintenance for infants and children (12.3%), general medical examination (6.9%), and consultation without complaint (4.3%) are the first three ranks of health problems with V codes for the FNP in the community-based clinic, whereas normal pregnancy (6.9%), health maintenance for infants and children (4.1%), and general medical examination (3.7%) are the first three ranks for the FNPs in the hospital-based clinics.

TABLE 4 Percentage Distribution of Frequently Reported Health Problems with V Codes by Setting and Provider Group, Family Practice

ICD-9-CM	*Community Clinic (Nc = 1)*[a]		*Hospital Clinics (Nc = 3)*[a]	
Code Specifications	*FNP (N = 301)*[b]	*Physician (N = 2,642)*[b]	*FNP (N = 1,023)*[b]	*Physician (N = 10,541)*[b]
V20 Health maintenance infant/child	12.3	0.1	4.1	3.2
V70 General medical exam	6.9	1.3	3.7	6.6
V65 Consultation without complaint	4.3	0.3	0.5	0.1
V25 Contraceptive management	3.3	2.5	3.2	1.5
V68 Administrative purposes	2.4	3.0	0.9	0.2
V67 Follow-up examination	2.0	1.9	2.1	2.5
V72 Special examination	1.3	1.9	0.6	0.3
V22 Normal Pregnancy	1.0	1.1	6.9	5.7
V58 Aftercare, unspecified	0.3	0.5	0.9	0.3
V06 Prophlactic vaccinations/combined diseases	0.0	0.0	1.1	0.4
Other health problems with V codes	4.1	2.2	2.5	2.3
Total V codes	37.9	14.8	26.5	23.1
Non-V codes	62.1	85.2	73.5	76.9
Total	100.0	100.0	100.0	100.0

a. *Nc* denotes number of clinics.

b. *N* denotes weighted frequency.

DISCUSSION

A convenience sample of one community- and three hospital-based clinics was selected. This sample represented all family practice clinics meeting study criteria in Cook County, Illinois, during the study period. Because only one community-based clinic is represented, interpretation of the descriptive and comparative data relating to the community-based clinic should be limited.

The ratio of visits made by male and female patients to FNPs and physicians was about three to seven. FNPs saw proportionally more visits made by female patients than male patients (Table 1). Possible explanations are that all FNPs were women and the majority of physicians were men, and that a large proportion of patient visits to FNPs was for contraceptive management and normal pregnancy.

Regarding age distribution, the proportion of visits made by adult patients was higher than that for visits made by youth patients to both provider groups in all four clinics (Table 1). In the youth group, persons aged 10 to 19 contributed the largest proportion of visits to both provider groups in all four clinics, particularly for the FNP in Clinic 14. In the adult group, persons aged 20 to 44 contributed the largest percentage of visits to both provider groups in all clinics except Clinic 54. The majority of patients in the study's family practice clinics was teenagers and young to middle-age adults. Age distribution of the visits seemed to be affected by provider. For example, 12.5% of all encounters for the FNP in Clinic 14 were visits by children from 1- to 4-years-old, and 24.2% of all encounters were with teenagers. This finding may reflect the FNPs personal interest in pediatric care, or her special ability in providing such care. Our finding of the provider's interest and ability is consistent with the findings of Greenberg et al. (1974) and of Merenstein, Wolfe, and Barker (1974), reporting the FNPs interest and ability in pediatric care. The percentage of visits made by persons 65 years and over (older adults) to both provider groups was low in comparison to other age groups. In all four clinics the physicians saw higher percentages of visits within the older adult group than did the FNPs. For example, in Clinic 54, visits made by older adults represented 16.6% of the physician case load, with 2.3 the average number of health problems per visit (Table 1). This clinic is in a large medical center drawing patients from medically deprived areas. Possibly, many older adults are faced with poverty and illness, so that they seek care from sources whose fees are affordable.

As expected, physicians in both community and hospital settings saw more types of health problems than FNPs (Table 2). The types of health problems seen by the FNPs in this study (161 for community-based and 178 for hospital-based clinics) are greater than the 116 types of health problems observed by Lewis and Linn (1977) for Primex graduates and the 115 types preselected by Pesznecker and Draye (1978). The variation in the types of health problems may relate to diversity of clinic settings, populations served, and the providers' educational preparation and interest.

For the FNP group, the percentage of frequently reported health problems was significantly higher (82.7%) in the community-based clinic than in the hospital-based clinics (63.5%). Generalization from this finding would be inappropriate because of the limited participation of one community-based clinic. However, Chen et al. (1982) report that the percentage of frequently reported health problems in the pediatric specialty is higher in community-based clinics than in hospital-based clinics. Percentages of health problems with V Codes identified by FNPs and physicians differ significantly in the community-based clinic. The FNPs demonstrate more wellness care management than the physicians (Table 4). This finding is consistent with that of Schwartz (1979); the physician group providing proportionately less wellness care in the community-based setting might reflect that the majority of wellness care had been provided by the FNP group.

In this study, the FNPs managed 10.3% of all patient visits in one community-based clinic and 12.2% in three hospital-based clinics. As discussed in Chen et al. (1982), the role of FNP did not seem well-established in these four clinics. The three hospital-based clinics were affiliated with large medical residency programs. The FNPs in these three clinics were observed to compete with the medical students for patients. This phenomenon is consistent with the reports that physician-intensive settings use the capabilities of nurse practitioners less effectively than settings that are not physician-intensive (Williams, 1979; Zammuto, Turner, Miller, Shannon, & Christian, 1979).

This study has provided insights into differences between FNP and physician practices. Much still needs to be learned about patient selection processes, complexity of problems managed by various types of providers, and therapies used by those providers.

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