Variations in Nursing Practice Environments

Relation to Staffing and Hospital Characteristics

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▶ **Background:** While improvements in nursing practice environments are considered essential to address the nursing shortage, relatively little is known about the nursing practice environments in most hospitals.

▶ **Objectives:** The objectives of this study are to describe variations in nursing practice environments across hospitals and to examine their associations to hospital bed size, community size, teaching intensity, and nurse staffing levels.

▶ **Methods:** The research design was cross-sectional analyses of nurse survey and administrative data for 156 Pennsylvania hospitals from 1999. For comparative reference, nurse survey data from earlier years from two small samples of nursing magnet hospitals were analyzed. The nursing practice environment was measured by the Practice Environment Scale of the Nursing Work Index (PES-NWI).

▶ **Results:** Nursing practice environments varied greatly among the hospitals studied. The nursing practice environments of the small samples of magnet hospitals were superior to those of the Pennsylvania sample. About 17% of the hospitals in the Pennsylvania sample had favorable practice environments. Pennsylvania hospitals with better practice environments had higher RN-to-bed ratios. Practice environment differences were not associated with hospital bed size or community size. Hospitals with a modest teaching level had less favorable environments.

▶ **Discussion:** Considerable variation exists in the quality of hospital nursing practice environments. Five out of six hospitals are targets for improvement. Favorable nursing practice environments can be achieved in a wide variety of hospital settings.

▶ **Key Words:** hospitals · nurse staffing · nursing care · organization

The current widespread nursing shortage is characterized by declining entrants into the profession, rapid exit of new entrants, and an aging and dissatisfied workforce (Aiken et al., 2001; Sochalski, 2002). Several national groups have declared that improving nursing practice environments is essential for addressing the shortage (American Hospital Association, 2002; American Nurses Association, 2002; Joint Commission on Accreditation of Healthcare Organizations, 2002; Kimball & O'Neil, 2002; U.S. General Accounting Office, 2001). Efforts by the American Nurses Association to promulgate better practice environments for nurses have yielded a small number of *magnet* hospitals recognized for exemplary environments by the American Nurses Credentialing Center (ANCC, 2005; Urden & Monarch, 2002).

Relatively little is known about how the nursing practice environment varies across hospitals. To date, practice environment research has been limited to purposive samples of mostly exemplary hospitals. Evidence comparing the original magnet hospitals to a matched control group indicated that the magnets had higher nurse staffing ratios (Aiken, Smith, & Lake, 1994). However, the hypothesized positive relationship between the practice environment and staffing has not been demonstrated more broadly. Moreover, both the original magnet hospitals and the ANCC-certified magnet hospitals have been disproportionately large, urban, not-for-profit teaching institutions as compared to U.S. community hospitals in general (Aiken et al., 1994; McClure, Poulin, Sovie, & Wandelt, 1983, pp. 6–7; description of the ANCC magnet hospitals is based on analysis of the 2003 American Hospital Association, Annual Survey Database (AHA, 2005) results not shown). There has been no systematic assessment of whether hospitals with these characteristics have more favorable nursing practice environments.

The purposes of this study were to describe the nursing practice environments in a broad sample of hospitals; to compare those environments to the environments in two small samples of nursing magnet hospitals from different time periods; to classify hospitals with favorable, mixed, and unfavorable practice environments; and to examine the relationships of the practice environment to both nurse staffing levels and hospital structural characteristics.

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Background

The nursing practice environment is a difficult concept to conceptualize and measure. It is one of a set of related concepts that have been described as "organizational factors that influence nursing practice" (Sleutel, 2000). Other concepts include the work environment, organizational climate, and organizational culture. While the nursing practice environment has been the focus of several studies, it has not been defined explicitly (Jones, Stasiowski, Simons, Boyd, & Lucas, 1993; Leveck & Jones, 1996). While a tremendous variety of concepts have been considered to be dimensions of the environment, several core dimensions emerge from the organization literature. These include leadership or management style, decentralized decision making, collaboration, and cohesion (Price & Mueller, 1981; Weisman, Alexander, & Chase, 1981).

Several theoretical frameworks of the relationships between organizational factors and outcomes have been proposed (Aiken, Sochalski, & Lake, 1997; Lake, 1999; Mark, Sayler, & Smith, 1996; Mitchell, Armstrong, Simpson, & Lentz 1989; Mitchell, Ferketich, & Jennings, 1998). The conceptualization used in this study derives from earlier work based on the sociological literature focused on organizations and occupations (Aiken et al., 1997; Lake, 1999, 2002). Aiken et al. (1997) theorized that organizational models that enhanced nurse autonomy, nurse control over resources, and nurse relations with physicians would yield better outcomes. Subsequently, Lake (1999) delineated two core dimensions of nursing organization: nurse staffing and the practice environment. Both the human resources available (staffing) and the social organization of work (the practice environment) were theorized to influence patient outcomes directly as well as indirectly through nurse job outcomes. Lake hypothesized that more registered nurses (per patient and as a proportion of all nursing staff) and a practice environment that facilitates professional nursing practice would result in better nurse and patient outcomes. Thus, the nursing practice environment was defined as the organizational characteristics of a work setting that facilitate or constrain professional nursing practice.

The hallmark of professional nursing is autonomous practice (American Association of Colleges of Nursing, 2002). Practice environments can be seen as a continuum from bureaucratic to professional. For example, in more bureaucratic environments, decision making is more centralized and relationships between nurses and physicians are more hierarchical. In more professional environments, decision making is decentralized and relationships between nurses and physicians are more collegial. In Lake's (1999) framework, staffing and environment were hypothesized to have a dynamic relationship. Better qualified nurses may create or demand a more professional environment; more professional environments may attract nurses more easily (increasing the quantity of staff), may retain their staff (increasing stability), or may attract or retain more qualified staff (e.g., more highly educated nurses).

Interest in practice environment research and reform was sparked by the original magnet hospital initiative. In 1983, amid an earlier nurse shortage, the American Academy of Nursing adopted an innovative strategy to identify and study hospitals that were succeeding at attracting nurses while most in their market areas were failing (McClure et al., 1983). Forty-one magnet hospitals nationally were identified by reputation as good places for nurses to work. Their low vacancy and turnover rates confirmed their success in attracting and retaining registered nurses.

In the two decades since the magnet hospitals were identified, a growing body of research has established their benefits for both nurses and patients (McClure & Hinshaw, 2002). This evidence prompted the ANCC to begin a formal process in 1995 whereby hospitals could become designated as magnets for a 4-year period based on adherence to the American Nurses Association's *Scope and Standards for Nurse Administrators* (ANCC, 2000). The ANCC is a relatively new program attempting to codify the features of magnet hospitals into a formal program of designation. This process has designated 155 acute care hospitals in the United States since 1994; two-thirds of these hospitals received the designation in the past 3 years alone (ANCC, 2005). Thus, a small number of the 4,900 acute care hospitals in the United States have been distinguished for professional nursing practice: 41 by reputation in the early 1980s and 155 by accreditation since the mid-1990s (three hospitals overlap the two groups).

Practice environment research has broadened beyond magnet hospitals to describe practice environments generally and to link practice environment variation to both nurse staffing and hospital characteristics. Adams, Bond, and Hale (1998) used hierarchical cluster analysis of nurse managers' questionnaire responses to classify nursing unit organizational practice. The researchers discerned three types of practices: devolved, two tier, and centralized nursing. These practice types were significantly associated with staff nurses' assessments of nursing unit features.

In devolved units, staffing adequacy and collaboration with medical staff were better and less hierarchical practice existed. Adams and Bond (2003) compared the nurse-to-bed ratios across these practice types and found significantly higher staffing in the devolved units and significantly lower staffing in the centralized units. Mark, Salyer, and Wan (2003) examined whether hospital characteristics were associated with the nursing unit's degree of professional practice, as measured by nurse reports of decentralization, autonomy, and collaborative practice. Although they attempted to model the effects of hospital size, teaching status, and case mix index on the degree of professional practice, these variables were deleted from the analyses due to distributional problems. They found that volatility in admissions was negatively associated with professional practice and that hospitals that offered more high technology services had more professional practice. Shamian, Kerr, Laschinger, and Thomson (2002) analyzed nurse reports of autonomy, control over practice, and nurse–physician relations in their work environments in 160 Canadian hospitals. They documented better autonomy and control over practice in teaching hospitals as compared to small or community hospitals. Nurse–physician relations were less favorable in community hospitals. They also found a more highly educated nursing staff in teaching hospitals. Seago, Ash, Spetz, Coffman, and Grumbach (2001)

examined whether the presence of persistent nursing shortages in the early 1990s was associated with different nursing care delivery systems in 1,127 hospitals in the United States. They found that hospitals with a persistent RN shortage were disproportionately team or functional nursing delivery. Conversely, disproportionately fewer hospitals with a persistent shortage had a primary/total nursing delivery system. This literature indicates that attempts to characterize hospitals beyond magnet status have begun and that practice environment differences have been associated with both staffing and hospital characteristics.

Measuring nursing practice environments has been challenging. The use of staff nurse surveys is a method that has been developed and refined over the past decade (Aiken & Patrician, 2000; Aiken et al., 1997; Lake, 2002; Shortell, Rousseau, Gillies, Devers, & Simons, 1991). This method permits examination of specific practice environment dimensions; for example, the degree to which nurses and physicians have collegial as opposed to hierarchical relationships. These dimensions are then quantified by a rating scale to discern effects based on more versus less of the dimension.

Methods

Design, Sample, and Data Sources

Secondary analyses were conducted of nurse survey data from three samples of hospitals: (a) adult acute care hospitals in Pennsylvania identified by a statewide survey mailed to registered nurses; (b) original magnet hospitals to provide a historical benchmark; and (c) ANCC magnet hospitals to provide a contemporary benchmark.

The first sample included staff nurses working in Pennsylvania hospitals in 1999 (Aiken et al., 2001). A 50% sample of nurses residing in Pennsylvania in 1998 was surveyed, and 41,860 nurses responded to a mailed survey (response rate = 52%). The subset of staff nurses in Pennsylvania's 208 adult community hospitals with values on the Practice Environment Scale of the Nursing Work Index (PES-NWI) items was identified (n = 11,629). For this study, 156 hospitals with a sufficient number of respondents for analysis were identified, as detailed below. The nurse respondents in these hospitals totaled 10,962. In this sample, 32% of the nurses worked on medical–surgical units, 20% in adult intensive care, 10.5% in obstetrics-gynecology, 10% in perioperative services, and 20% on other types of units. The remainder (7.5%) did not report nursing unit type.

The sample of 16 original magnet hospitals selected and surveyed in 1985–1986 (Kramer & Hafner, 1989) represented 40% of the original magnets identified in 1982 (McClure et al., 1983). These magnets were drawn proportionately from all regions of the country and a 25% random sample of nurses was surveyed in each hospital. The response rate was 80% (n = 1,610).

The third sample comprised the seven hospitals that had received ANCC magnet designation by 1998 (Aiken, Havens, & Sloane, 2000). All medical–surgical nurses were surveyed, with a 59% response rate (n = 1,054).

Hospital characteristics for the three samples were obtained from American Hospital Association (AHA) survey data for the respective years. Staffing levels for the Pennsylvania sample were obtained from 1998 Pennsylvania Department of Health data. Hospital characteristics and staffing levels were not available for 20 Pennsylvania hospitals due to reporting at the health system, rather than the hospital, level.

The Pennsylvania hospitals were nearly all (97%) not-for-profit, 83% were located in urban areas, and 71% had between 100 and 299 beds. About half (51%) of the hospitals were nonteaching institutions; 40% were minor teaching and 9% were major teaching institutions. Hospitals in the two magnet samples were larger, located exclusively in urban settings, and a greater proportion were teaching hospitals than in the Pennsylvania sample. Details on the hospital characteristics for these samples are not provided given the small sample sizes.

Demographic characteristics and nursing education and experience of nurses in the Pennsylvania and ANCC samples were summarized from the data files but were not available for the reputational magnet hospital nurses. A published source provided the education and experience characteristics for that sample (Kramer & Schmalenberg, 1988). Nurses in the two contemporary samples (ANCC and PA) were nearly all female (94%). On average, the Pennsylvania nurses were older (mean age: 40 years) than the ANCC magnet hospital nurses (36 years). The Pennsylvania nurses were the most experienced (mean hospital tenure: 10 years); the ANCC and original magnet hospital nurses were less experienced (7 and 5.6 years, respectively). The proportions of nurses with at least a baccalaureate degree as the highest nursing degree varied considerably across the samples: 37% of the Pennsylvania sample nurses, 62% of ANCC sample nurses, and 36% of the original magnet hospital sample nurses.

Measures

The PES-NWI was used to measure the extent to which a nurse's work setting facilitates professional nursing practice as exemplified by the original magnet hospitals (Lake, 2002). The PES-NWI has been shown to be a valid and reliable tool for the measurement of the hospital nursing practice environment (Lake, 2002). Recent studies have associated poorer scores on PES-NWI subscales to increased odds of needlestick injuries and nurses' intention to leave their job (Clarke, Sloane, & Aiken, 2002; Thomas-Hawkins, Denno, Currier, & Wick, 2003). The PES-NWI was recently endorsed by the National Quality Forum as a national voluntary consensus standard for nursing-sensitive care (National Quality Forum, 2004, p. C-10).

The PES-NWI comprises 31 items in five subscales that characterize the nature of professional nursing practice in the original magnet hospitals. The respective subscales and an example item from each are as follows: Nurse Participation in Hospital Affairs ("Staff nurses are involved in the internal governance of the hospital."); Staffing and Resource Adequacy ("Enough staff to get the work done."); Nursing Foundations for Quality of Care ("A preceptor program for newly hired RNs."); Nurse Manager Ability, Leadership, and Support of Nurses ("A nurse manager who is a good manager and leader."); and

Collegial Nurse/Physician Relations ("A lot of team work between nurses and doctors.").

The nurse rates each item on a scale of 1 (*strongly disagree*) to 4 (*strongly agree*) to indicate whether the feature is "present in the current job." Given that items are positively framed, being present is considered favorable. The subscale score is the average of the subscale item responses. A single composite score is calculated as the mean of the subscale scores. The potential score ranges from 1 to 4; higher scores indicate more agreement that the subscale items are present in the current job. Values above 2.5 indicate general agreement and values below 2.5 indicate disagreement that the characteristics measured by the scales are present. Hospital-level means were calculated for each item from each hospital's nurse respondents. Hospital-level subscale scores were calculated as the mean of the hospital-level item scores; hospital-level composite scores were calculated as the mean of the hospital-level subscale scores.

At least one nurse responded from each of the 208 community hospitals in Pennsylvania. The range in the number of nurse respondents per hospital was 1–264. The minimum number of nurse respondents per hospital must be assessed to provide reliable hospital-level values (Verran, Gerber, & Milton, 1995). The reliability of the hospital mean was examined (Glick, 1985) by calculating the intraclass correlation coefficient ICC(1,k) from a one-way ANOVA of the subscale and composite scores across hospitals. Hospitals were stratified by numbers of respondents. Using Glick's criterion of a minimum ICC(1,k) of .60, it was determined that 15 or more respondents per hospital were best for reliable estimates with ICC(1,k) ranges from .67 to .82. Thus, 52 of the 208 hospitals with fewer than 15 respondents were excluded from further analysis. Data from all respondents in the remaining 156 hospitals were used to provide maximally informative PES-NWI scores. Internal consistency reliability at the hospital level was assessed by Cronbach's alpha. All subscales and the composite were highly internally consistent (α = .88–.98).

The size of the hospital's community was classified according to Metropolitan Statistical Area size (Office of Management and Budget, 1990). Hospital bed size was measured as "hospital unit beds set up and staffed" and classified as fewer than 100 beds, 100–299 beds, and 300 or more beds. To measure hospital teaching status, the ratio of resident physicians and fellows to hospital beds was calculated. Based on the distribution of the sample, hospitals were classified as major (approximately 1 trainee or more per 4 beds), high minor (1 for 5–8 beds), low minor (1 for 9–50 beds), or nonteaching. This categorization, while consistent with other published measures of teaching intensity (Ayanian, Weissman, Chasan-Taber, & Epstein, 1998), further distinguishes two levels of minor teaching intensity. The RN-to-patient ratio was measured as the number of full-time equivalent RNs per bed.

Procedures and Data Analysis
The three studies used to generate the data received institutional review board approval for human subjects (Aiken et al., 2001; Aiken, Havens, et al., 2000; Kramer,

Schmalenberg, & Hafner, 1989). Analyses were conducted in two stages. The first described the nursing practice environments of Pennsylvania hospitals and compared them to those of the two magnet samples. The second examined relationships among the practice environment, nurse staffing, and hospital structural characteristics (community size, bed size, teaching intensity) in the Pennsylvania sample only. The latter analyses were not conducted for the magnet samples due to the overall objective of exploring these relationships in hospitals more generally. A subsample of 136 hospitals was used for these analyses due to missing information on hospital characteristics or staffing.

All analyses were conducted at the hospital level. For the three samples, the distributions of the PES-NWI composite scores were graphed and the subscale and composite scores were compared. Statistically significant pairwise differences in means between hospital sets were identified by the Gabriel test, which is preferred in cases with unequal numbers of observations in the classes being compared (Gabriel, 1978). The Gabriel test uses the studentized maximum modulus distribution to generate the minimum significant difference, here implemented via the GLM procedure in SAS (SAS Institute Inc., 1989).

The composite score provides a single, continuous measure by which to compare practice environments. However, an alternative was sought that would be simpler to interpret and easier to communicate to hospital managers. Thus, a three-level classification was created (favorable, mixed, and unfavorable) that sorts hospitals by how many subscales are rated favorably by their nurses. A fairly generous standard was used to identify favorable ratings: values above 2.5 (the theoretical midpoint value) were considered favorable because they were on the side of agreement that the features were present in the current job situation. Hospitals rated favorably on no or one subscale were classified as unfavorable; on two or three subscales as mixed; and on four or five subscales as favorable.

Two strategies were used to test the validity of this classification. First, the proportions of hospitals in these categories were compared across the three hospital sets. Underlying the use of this known-groups approach to construct validity was the expectation that a valid classification would assign original and ANCC magnet hospitals to the favorable category and that the Pennsylvania hospitals would sort across the three categories. Second, it was tested whether the theoretical classification would be confirmed empirically through latent class analysis (LCA), implemented in MPlus, which evaluated if the Pennsylvania hospitals clustered in a systematic way based on their subscale scores (Muthén, 2002; Muthén & Muthén, 2001). The number of classes was identified in sequential models beginning with two classes, then three, four, and so on, until two criteria were satisfied: model convergence and a minimal Bayesian Information Criterion (BIC) (Raftery, 1993). The models also were used to calculate the probability that a hospital would be assigned to each class. Based on the results from the best model, each hospital was assigned to a latent class using a probability criterion of .90. Here, a valid classification would be confirmed by a high degree of overlap in hospital assignment to theoretically versus empirically derived categories. The proportions of
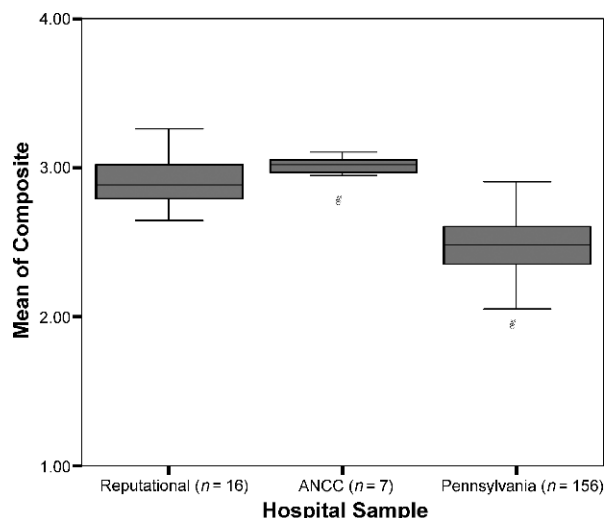
FIGURE 1. Distribution of PES-NWI composite scores for three samples of hospitals. *Note.* PES-NWI indicates Practice Environment Scale of the Nursing Work Index; ANCC, American Nurses Credentialing Center.

hospitals across the three theoretical categories versus the empirical latent classes were compared.

To evaluate the similarity across samples of the hospitals rated as favorable, differences in subscale scores were assessed by the Gabriel test. The characteristics of the Pennsylvania hospitals classified as having favorable environments were described.

For the second stage analyses of Pennsylvania hospitals only, the first analysis focused on whether certain hospital characteristics were associated with favorable, mixed, or unfavorable practice environments. Ordered logit regression of the practice environment classification on community size, bed size, and teaching intensity was conducted. Hospital ownership (i.e., not-for-profit, public, or for-profit) could not be analyzed because nearly all sample hospitals were not-for-profit. To explore the empirical link between the practice environment and staffing, the Gabriel test was used to compare nurse staffing levels by practice

environment categories. Values of p above .05 were considered significant for all analyses.

Results

Figure 1 plots the distributions of the three sets of hospitals on the NWI-PES composite. Both sets of magnet hospitals had substantially higher scores than the Pennsylvania hospitals, roughly 2.5 *SD* difference. All magnet hospital scores fell within or above the top quartile of the Pennsylvania distribution. The scores of the ANCC magnet hospitals were the highest (mean = 2.99; range = 2.75–3.11). Six of the seven ANCC magnet hospitals had composite scores exceeding the highest scoring Pennsylvania hospital. Three-quarters of the original magnet sample scores (mean = 2.92; range = 2.65–3.27) fell at or below the median score for the ANCCs. On average, nurses in magnet hospitals agreed that key organizational features were present in their current job (a value of 3 indicates agreement). By contrast, nurses in Pennsylvania hospitals were neutral (mean = 2.48; range = 1.92–2.91).

Table 1 displays the PES-NWI subscale and composite means by hospital sample. For Pennsylvania, the means indicate that for two subscales, nurses on average agreed that these characteristics were present (Nursing Foundations for Quality of Care, mean = 2.81; Collegial Nurse/Physician Relations, mean = 2.75). For three subscales, nurses disagreed that these characteristics were present (Nurse Participation in Hospital Affairs, mean = 2.30; Nurse Manager Ability, Leadership, and Support of Nurses, mean = 2.36; and Staffing and Resource Adequacy, mean = 2.18). Pennsylvania hospitals scored significantly lower than both sets of magnet hospitals on all subscales ($p < .0001$). Only the Nursing Foundations for Quality of Care subscale exhibited significant differences between the two sets of magnet hospitals ($p < .001$). Here, the ANCC magnets exceeded the original magnets.

The next series of analyses addressed the classification of hospital nurse practice environments as favorable, mixed, or unfavorable based upon the number of subscales with values above 2.5. All magnet hospitals and 17.3% of

TABLE 1. PES-NWI Scores by Hospital Sample

| | Means (*SD*) | | |
| | Pennsylvania, 1999 | ANCC Magnets, 1998 | Reputational Magnets, 1986 |
Subscale	(n = 156)	(n = 7)	(n = 16)
Nurse participation in hospital affairs	2.30 (0.23)[a,b]	2.96 (0.18)	2.75 (0.22)
Nursing foundations for quality of care	2.81 (0.20)[a,b]	3.32 (0.15)	3.07 (0.19)[b]
Nurse manager ability, leadership, and support of nurses	2.36 (0.24)[a,b]	2.91 (0.14)	2.99 (0.17)
Staffing and resource adequacy	2.18 (0.26)[a,b]	2.77 (0.24)	2.82 (0.28)
Collegial nurse/physician relations	2.75 (0.16)[a,b]	3.02 (0.12)	2.96 (0.13)
Composite	2.48 (0.18)[a,b]	2.99 (0.12)	2.92 (0.17)

Note. F ranges for ANOVAs on five subscales by hospital sample 20.9–67.5; all $p < .0001$; *df* = 2,176. Analysis using the Gabriel method.
[a]Significantly lower score when compared with Reputational Magnets ($p < .01$).
[b]Significantly lower score compared with ANCC Magnets ($p < .01$).

TABLE 2. Ordered Logit Regression Coefficients and Odds Ratios (OR) Indicating the Effects of Various Characteristics on the Practice Environment in the Pennsylvania Hospital Sample (n = 136)

Characteristic		Coefficient (OR)	p
MSA size	<100,000 population	–	–
	100,000–249,999	−0.29 (0.75)	.77
	250,000–999,999	−0.44 (0.64)	.50
	≥1,000,000	−0.47 (0.63)	.42
Bed size	<100 beds	–	–
	100–299	−1.66 (0.19)	.06
	≥300	−1.61 (0.20)	.12
Teaching status	Nonteaching	–	–
	Low minor	−1.44 (0.24)	.01
	High minor	−0.05 (0.95)	.94
	Major	0.96 (2.61)	.23

Note. Coefficients reflect the likelihood that presence of the hospital characteristic is associated with better practice environments (measured as an ordinal variable with three categories: unfavorable, mixed, and favorable). MSA indicates Metropolitan Statistical Area.

Pennsylvania hospitals were classified as having favorable practice environments. Most Pennsylvania hospitals were classified as mixed (72.4%); 10.3% were classified as having unfavorable environments. These distributions confirmed the known-groups expectations. The LCA yielded three latent classes of hospitals, consistent with the theoretical classes. Between the models of two versus three classes, the minimal BIC was obtained for three classes. The model with four latent classes did not converge. There was a very high degree of overlap between the theoretical and empirical classifications: 97% of the hospitals classified as favorable were classified into the top LCA category; 65% of hospitals classified as mixed were classified into the middle LCA category; 92% of hospitals classified as unfavorable were classified into the bottom LCA category.

Pennsylvania hospitals classified as having favorable practice environments scored lower than ANCC magnets on all five subscales. These differences were significant for three subscales: Nurse Participation in Hospital Affairs, Nursing Foundations for Quality of Care, and Nurse Manager Ability, Leadership, and Support of Nurses ($p <$ .01). These differences were sizable, from 1.4 to 2.8 SD. Thus, although the Pennsylvania cohort met the classification of having favorable environments, the ANCC sample had exemplary environments. Hospital characteristics data were available on 24 of the 27 Pennsylvania hospitals classified as having favorable environments. Over one third were rural hospitals, four-fifths had fewer than 300 beds, and 58% were nonteaching.

Table 2 displays coefficients for an ordered logit model predicting better practice environment classifications from hospital characteristics in Pennsylvania hospitals. Positive coefficients indicate that higher values of the explanatory variable are associated with better practice environments. When compared with nonteaching hospitals, low-minor teaching hospitals had significantly lower odds of having a favorable practice environment (OR 0.24, p = .01). Hospitals with 100–299 beds had lower odds of having favorable practice environments than smaller hospitals, but this result did not meet criteria for statistical significance (OR 0.19, p = .056). Community size was not significantly associated with the practice environment.

In the Pennsylvania hospitals, nurse staffing averaged 1.30 RNs per bed (SD = 0.39; range 0.46–2.38). The nurse-to-bed ratios by the three practice environment categories are plotted in Figure 2. Hospitals in the favorable category had significantly higher staffing than hospitals in both the mixed and unfavorable categories ($p <$ .05 by the Gabriel method). The difference between the hospitals classified as unfavorable versus favorable was 0.39 RNs per bed, or 1 SD.

Discussion

This is the first study to examine the variation in nursing practice environments in a large sample of hospitals. It was determined that the nursing practice environment varies more widely in these hospitals than in prior purposive samples. Moreover, the findings support the credibility of the ANCC magnet designation by demonstrating that hospitals with this designation have more favorable environments than nonmagnet hospitals. The PES-NWI subscale scores in the large sample of Pennsylvania hospitals suggest that while some aspects of their environments receive fair ratings (i.e., nursing foundations for quality and collegial relationships between nurses and physicians), most receive poor ratings (nurse manager
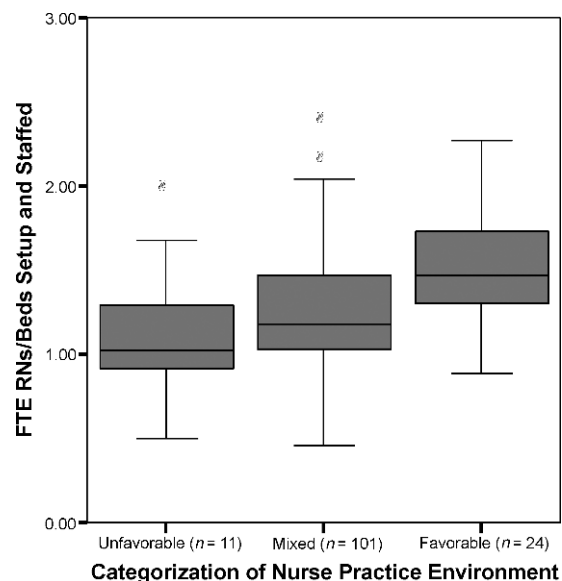
FIGURE 2. Distribution of RN-to-bed ratios by categories of the practice environment, Pennsylvania hospitals (N = 136). *Note.* RN indicates Registered Nurse; FTE, full time equivalent.

supportiveness, nurse participation in hospital affairs, and staffing adequacy).

Relatively few (17%) nonmagnet hospitals were classified as having favorable environments. This finding provides a useful number that has heretofore been unknown. It provides a benchmark for organizations interested in differentiating hospitals by quality. The proportions of favorable, mixed, and unfavorable hospitals by the PES-NWI classification were roughly comparable to those found by Adams et al. (1998) across 74 acute nursing units in 17 British hospitals: Of these, 11% were classified as devolved with characteristics consistent with favorable practice environments. Three quarters of the units were two-tier, and the remaining 13.5% were centralized.

Favorable nursing practice environments were linked with higher nurse-to-bed ratios, consistent with Aiken et al. (1994), Adams et al. (1998), and Seago et al. (2001). Seago et al. found that hospitals with primary or total nursing delivery were less likely to report having a persistent nursing shortage compared to hospitals with functional delivery. However, hospitals within the favorable category of practice environments had a wide variation in staffing, further supporting Lake's (1999) thesis that staffing and practice environment are distinct concepts when considering the organization of hospital nursing. Clearly, some hospitals had favorable environments without high staffing levels. Of the three hospital samples analyzed, the Pennsylvania sample in 1999 had the lowest subscale score (2.19) for Staffing and Resource Adequacy. In this context, private and public sector initiatives to augment nurse staffing are promising developments to address the inadequacies. Since 1999, nurse staffing legislation or regulation has been introduced in 20 states (including Pennsylvania) and passed in 8 (American Nurses Association, 2004). A federal staffing initiative was introduced in 2003 and reintroduced in 2005 (Artz, 2005; U.S. Senate, 2003). The Joint Commission on Accreditation of Healthcare Organizations (2005) implemented staffing effectiveness standards in July 2002.

Better environments were not associated strongly with hospital characteristics common among magnet hospitals, which have been disproportionately large, urban teaching institutions. This finding contrasts with findings from similar research on 160 Canadian hospitals by Shamian et al. (2002). They found better work environments in teaching hospitals as compared to small or community hospitals. The current finding that hospitals with a very modest teaching intensity have poorer practice environments than nonteaching hospitals is surprising, given that other teaching categories did not differ significantly. Nurses in low-minor teaching hospitals may perceive a weak hospital commitment to the education mission, which they may relate to the facility's commitment to professional nursing. These findings suggest it would be incorrect to assume that hospital characteristics are proxies for the attributes of professional nursing practice.

No evidence was found that community size predicted favorable practice environments. Over one third (37.5%) of the Pennsylvania hospitals categorized with favorable environments were in rural communities. By contrast, the analysis (not shown) of community size of the currently

designated ANCC magnet hospitals indicates that just seven are located in rural areas. In part, the pursuit of ANCC designation may be market driven. Although 38 states have hospitals with this designation, 20% of these hospitals are located in New York and New Jersey. Competitive pressures may stimulate practice environment reforms, but the evidence presented here indicates that favorable environments exist in hospitals functioning as the sole employer in their communities as well.

Currently, about 3% of the nation's hospitals are ANCC magnets. About one in six Pennsylvania hospitals had favorable nursing practice environments. While these hospitals classified similarly to magnets, their scores on all subscales were poorer than those of the ANCC magnets. In the analysis of the three hospital samples, the best practice environments for nursing were found in the ANCC-designated hospitals. Practice environment quality is not static. Evidence from a cohort of original magnet hospitals showed a decline in the quality of practice environments from 1986 to 1998, as measured by three PES-NWI subscales: Staffing and Resource Adequacy, Nurse Manager Ability, Leadership, and Support of Nurses, and Nurse Participation in Hospital Affairs (Aiken, Clarke, & Sloane, 2000). The influence of the ANCC designation process on the practice environment could be evaluated by pre- and postsurveys in applicant hospitals. Analyses of subscale scores could aid managers in targeting critical areas for practice environment reforms.

The PES-NWI effectively discriminated practice environments in a broad sample of hospitals. While the composite score remains useful as an overall gauge of the practice environment, a measurement innovation reported here is a classification that is easier to interpret (e.g., the category *favorable* is easier to understand than a particular mean score). A valid classification simplifies the description and comparison of hospitals as well as provides empirical flexibility. Previously, it has not been possible to classify hospitals into theoretically meaningful or practically useful categories describing their practice environments. The validity of the classification was strongly supported by both the distribution of hospitals in the three samples across the three categories and results of the latent class analyses. In this sample, a small number of staff nurses (15) were required for reliable hospital-level estimates of the PES-NWI. This evidence suggests that a modest investment in surveys of nurses could provide reliable and important information on the practice environment not readily captured by administrative data.

These findings contribute to the evidence base on nursing practice environments. This evidence is important to effectively address both the nursing shortage and patient safety concerns. The Institute of Medicine (2003) report *Keeping Patients Safe* declared "the typical work environment of nurses is characterized by many serious threats to patient safety" (p. 3). The evidence here suggests that the typical practice environment for nurses does not support professional nursing practice. Transforming nurses' environments must become a priority for most hospitals.

This research provides a building block for studies linking practice environment and staffing variances to patient and nurse outcomes. The evidence indicates that

environment and staffing should be measured as distinct organizational factors. In research on patient outcomes, measurement of hospital structural characteristics does not account for the influence of nursing.

There are several limitations of this study. While the Pennsylvania hospital sample studied here is the largest U.S. sample with primary data in nursing organizational studies, it is not representative. The Pennsylvania sample has more urban, not-for-profit, and midsize hospitals than hospitals nationally. The findings may not generalize to public or investor-owned hospitals, which make up a third of hospitals nationally but just 4% of the Pennsylvania sample. It could not be determined whether there are systematic differences in practice environments related to differences in hospital ownership. The description of the first seven ANCC magnet hospitals cannot be generalized to hospitals that received this designation subsequently. Professional practice environments on nursing units within hospitals may differ significantly. One limitation of the study is that using hospital-level data does not allow us to capture these variations.

Relatively few hospitals possess favorable nursing practice environments. Most hospitals need to make improvements. Favorable practice environments can be found in small, rural, and nonteaching hospitals as well as large, urban teaching facilities. Thus, opportunities exist for every hospital to create and maintain good places for nurses to practice. Despite a positive relationship between the practice environment and nurse staffing, some hospitals have favorable environments with fewer nurses. Organizational case studies of hospitals classified as having favorable, mixed, and unfavorable practice environments may provide the rich detail that could guide hospital managers toward the creation of better practice environments. Ultimately, dissemination of successful processes could help all institutions retain satisfied nurses and deliver excellent nursing care. ▼

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