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Title: Using the Practice Environment Scale of the Nursing Work Index on Asian Nurses Working in the United States

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**Abstract:** Background: Researchers have used the Practice Environment Scale of the Nursing Work Index (PES-NWI) to examine the perception of practice environment among U.S. nurses, in general; however, the scale has not been used to specifically measure perceptions among Asian nurses working in the United States, the largest group of international nurses in the nation.

**Objective:** To test the reliability and validity of the PES-NWI scale when applied to Asian nurses working in the United States.

**Method:** The study used a cross-sectional design with snowball sampling. Data from 230 Asian nurses who were born in Far Eastern countries and had worked at least 6 months in their current job at a U.S. hospital were analyzed, using Cronbach's alpha, item-total and inter-item correlation, and factor analysis.

**Results:** The Cronbach's alpha for the PES-NWI was .96, and item-total correlation coefficients ranged from .49 to .77. Five factors, which explained 59.12% of variance in the perception of practice environment, emerged: nurse participation and development; nurse manager ability, leadership, and support of nurses; nursing foundations for quality of care; staffing and resource adequacy; and collegial nurse-physician relations. Three derived factors were reconstructed, and one factor was renamed based on the meanings of scale items that were included in the factor.

Discussion: Study findings demonstrate the PES-NWI is a reliable and validated scale when applied to Asian nurses working in the United States. Findings also indicate Asian nurses perceive practice environment differently than American nurses, most likely due to dissimilar cultural beliefs. A better understanding of these differences may help develop more individualized support for Asian nurses as they adapt to working in the United States.

Key words: reliability and validity, Asian nurses, practice environment

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March 20, 2008

Molly C. Dougherty, PhD, RN, FAAN  
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Dear Dr. Dougherty, the Editor:

We are submitting a manuscript titled "Using the Practice Environment Scale of the Nursing Work Index on Asian Nurses Working in the United States" for your consideration of publishing it in the Nursing Research. This manuscript is a secondary data analysis focusing on psychometric properties of using an instrument developed in the western culture on Asian nurses. The results showed satisfactory reliability and validity of the instrument; however, Asian nurses construct practice environment differently than American nurses. This manuscript has not been published or under consideration for publishing elsewhere. Both authors contributed significantly in analyzing the data and composing the manuscript. Both authors also agree with the content of the manuscript. The study was approved by the Institutional Review Board in a university in the U.S. and ethical considerations were followed. The study was not a funded study and both authors do not have any conflicts of interest. We appreciate your kindly consideration and look forward to hearing from you.

Sincerely yours,

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USING THE PRACTICE ENVIRONMENT SCALE OF THE NURSING WORK INDEX  
ON ASIAN NURSES WORKING IN THE UNITED STATES

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1 Abstract

2 **Background:** Researchers have used the Practice Environment Scale of the Nursing Work Index  
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4 however, the scale has not been used to specifically measure perceptions among Asian nurses  
5 working in the United States, the largest group of international nurses in the nation.

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10 job at a U.S. hospital were analyzed, using Cronbach's alpha, item-total and inter-item  
11 correlation, and factor analysis.

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17 one factor was renamed based on the meanings of scale items that were included in the factor.

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19 applied to Asian nurses working in the United States. Findings also indicate Asian nurses  
20 perceive practice environment differently than American nurses, most likely due to dissimilar  
21 cultural beliefs. A better understanding of these differences may help develop more  
22 individualized support for Asian nurses as they adapt to working in the United States.

23 **Key words:** reliability and validity, Asian nurses, practice environment

1 USING THE PRACTICE ENVIRONMENT SCALE OF THE NURSING WORK INDEX ON  
2 ASIAN NURSES WORKING IN THE UNITED STATES

3 Background

4 The current nursing shortage is a serious issue in the healthcare delivery system in the  
5 United States because it threatens the well-being of nurses and patients, alike (Joint Commission  
6 on Accreditation of Healthcare Organizations [JCAHO], 2002; Needleman, Buerhaus, Mattke,  
7 Stewart, & Zelevinsky, 2002). The nation's nursing shortage implies that most U.S. healthcare  
8 facilities cannot provide appropriate staffing of nurses, which, in turn, affects the quality of  
9 patient outcomes (JCAHO, 2002). Nursing researchers have proposed that job dissatisfaction is a  
10 fundamental factor underlying the nursing shortage and that practice environment has the  
11 greatest impact on job satisfaction. As researchers have noted, a better practice environment  
12 increases the level of job satisfaction and, hence, encourages nurses to remain in the work force  
13 (Aiken, Clarke, Sloane, Sochalski, & Silber, 2002; Lake, 2002). In addition, the American  
14 Nurses Association (2007) proposed that job satisfaction and practice environment be measured  
15 and established as nurse-sensitive indicators, which further emphasizes the importance of  
16 examining practice environment when addressing the nation's shortage of nurses.

17 Developing instruments to measure the concept of practice environment, therefore, has  
18 increasingly become the focus of nursing research in order to provide insight and suggest  
19 interventions that may help alleviate the nursing shortage. Developed instruments include  
20 Kramer and Hafner's (1989) Nursing Work Index, which contains 65 items; Aiken and  
21 Patrician's (2000) Nursing Work Index Revised, which includes 57 items; and Lake's (2002)  
22 Practice Environment Scale of the Nursing Work Index, which contains 31 items. However,  
23 these instruments, developed in Western cultures, may not adequately measure another important

1 component in today's changing structure of nursing staffs: the perception of practice  
2 environment among Asian nurses working in the United States.

3 To help alleviate the nation's nursing shortage, many U.S. healthcare organizations recruit  
4 nurses from overseas. Asian nurses seem to represent the largest proportion of the growing rate  
5 of foreign-born nurses working in the United States (Brush, Sochalski, & Berger, 2004). As a  
6 result, U.S. nursing staffs are becoming increasingly culturally and ethnically diverse. However,  
7 values and beliefs in the workplace often differ among people of varied cultures (Hofstede, 1980;  
8 Schwartz, 1999). Nurses from Far Eastern countries, a collectivist culture, may be distinctly  
9 different from nurses from Western countries, an individualist culture (Hofstede, 1980; Triandis,  
10 1995). Thus, Western-developed instruments that measure nurses' perceptions of practice  
11 environment may not be sensitive to cultural differences that affect the perceptions of Asian  
12 nurses working in the United States.

13 To examine this possibility, we chose the Practice Environment Scale of the Nursing Work  
14 Index (PES-NWI) to test the scale's reliability and validity when applied to Asian nurses  
15 working in the United States. Compared to other similar instruments, the PES-NWI is more  
16 parsimonious and psychometrically sound with empirical subscales, as demonstrated in the  
17 scale's development study by Lake (2002).

18 Method

### 19 *Design and Sample*

20 The present study used a cross-sectional postal survey with snowball sampling. The  
21 institutional review board of the University of Texas approved the study. Eligible participants  
22 included only nurses who were born in Far Eastern countries and had worked for at least 6  
23 months in their current job at a U.S. hospital (not at an agency). A total of 321 Asian nurses were

1 contacted, and 231 participants returned questionnaires; however, one questionnaire was  
2 excluded from the analysis for its high missing rate (19.4%). Of the 230 participants, 90.9% were  
3 females, 37.4% were Philippines, 28.7% were Chinese, 64.3% were married, 77.7% had a  
4 bachelor's or higher degree, and 81.7% worked full time. On average, they had lived 12.74 ( $SD$   
5 = 9.58) years in the United States, had practiced 6.60 ( $SD = 7.50$ ) years at their current position,  
6 and had a mean age of 39.32 ( $SD = 10.00$ ) years.

### 7 *Instrument*

8 The present study used the PES-NWI, developed by Lake in 2002. Lake defined practice  
9 environment as “organizational characteristics of a work setting that facilitate or constrain  
10 professional nursing practice” (p. 178). The PES-NWI is a 31-item, 4-point Likert scale. A  
11 higher score indicates a better practice environment as perceived by nurses. In Lake's scale-  
12 development study, a factor analysis revealed five subscales. Lake found that the Cronbach's  
13 alphas for the instrument's five subscales and the entire scale were .71 to .84 and .82,  
14 respectively. The intraclass correlation of the five subscales and the entire scale were .86 to .97  
15 and .96, respectively.

16 Lake (2002) named and defined each of the PES-NWI's subscales. In defining the *Nurse*  
17 *Participation in Hospital Affairs* subscale (9 items), Lake noted that “nurses are involved in  
18 hospital and nursing department affairs, have opportunities for advancement, communicate  
19 openly with a responsive nursing administration, and acknowledge a powerful, visible, and  
20 accessible nurse executive” (p. 181). In describing the *Nurse Manager Ability, Leadership, and*  
21 *Support of Nurses* subscale (5 items), Lake observed that “nurse managers [are] able to support  
22 nurses when there is a conflict with a physician and when nurses make mistakes, and [to] praise  
23 and recognize a job well done” (p. 182). In defining the *Nursing Foundations for Quality of Care*

1 subscale (10 items), Lake noted that “a high standard of patient care includes a pervasive nursing  
2 philosophy, a nursing model of care, and nurses’ clinical competence” (p. 181). Lake described  
3 the *Staffing and Resource Adequacy* subscale (4 items) as “adequate staff and support resources  
4 to provide quality patient care such as being able to spend time with patients, and being able to  
5 discuss patient care problems with other nurses” (p. 182). Finally, Lake defined the *Collegial*  
6 *Nurse-Physician Relations* subscale (3 items) as “having positive working relationships between  
7 nurses and physicians” (p. 182).

### 8 *Statistical Analysis*

9 In the present study, data were analyzed using SPSS 14.0. The reliability of the PES-NWI  
10 was tested with Cronbach’s alpha, inter-item correlation, and item-total correlation; the scale’s  
11 validity was assessed by using factor analysis with oblique rotation. This study intended to  
12 understand how the PES-NWI explains Asian nurses’ perception of their practice environment  
13 rather than to test an existing model. Therefore, instead of confirmatory factor analysis,  
14 exploratory factor analysis was used. Additionally, common factor analysis rather than principal  
15 component analysis was used because the purpose of the study was not data reduction but to  
16 identify latent constructs underlying measured variables (Fabrigar, Wegener, MacCallum, &  
17 Strahan, 1999). Lake (2002) used orthogonal rotation to understand factors (subscales) of the  
18 PES-NWI in the scale-development study. However, Lake found that the factors of the PES-  
19 NWI were moderately correlated; therefore, in the current study, oblique rotation rather than  
20 orthogonal rotation was chosen (Fabrigar et al., 1999). The criterion for considering a salient  
21 factor loading was .30 (Munro, 2001). A Cronbach’s alpha of .70 is considered a minimum  
22 acceptable criterion of instrument internal consistency (Robinson, Shaver, & Wrightsman, 1991).

23

## Results

1       The Cronbach's alpha for the entire PES-NWI scale was .96 in the current study, compared  
2 to .82 in Lake's (2002) study. Factor analysis in the current study revealed five factors (see Table  
3 1). Only one (Factor I) was renamed from Lake's study, based on the common meaning of scale  
4 items categorized in this newly derived factor. The five factors were Factor I – *Nurse*  
5 *Participation and Development* (12 items,  $\alpha = .94$ , item-total correlation ranged from .57 to .82);  
6 Factor II – *Nurse Manager Ability, Leadership, and Support of Nurses* (10 items,  $\alpha = .92$ , item-  
7 total correlation ranged from .48 to .79); Factor III – *Nursing Foundations for Quality of Care* (4  
8 items,  $\alpha = .80$ , item-total correlation ranged from .53 to .66); Factor IV – *Staffing and Resource*  
9 *Adequacy* (4 items,  $\alpha = .81$ , item-total correlation ranged from .54 to .72); and Factor V –  
10 *Collegial Nurse-Physician Relations* (1 item). Factors I–V explained 47.07%, 4.08%, 3.16%,  
11 2.71%, and 2.10%, respectively, of the variance of perception of practice environment. The five  
12 factors were intercorrelated ( $r = .30$  to  $.78$ ).

13       Further categorization of factors was made, based on meanings of the scale items and on  
14 factor loadings. As shown in Table 1, Scale Item 16 (“A lot of team work between nurses and  
15 physician”) and Scale Item 24 (“Collaboration between nurses and physician”) had pattern  
16 loadings higher than .30 and structure loadings higher than .70 on Factor V – *Collegial Nurse-*  
17 *Physician Relations*. The meanings of these two scale items were similar to Item 2 (“Physician  
18 and nurses have good working relationships”), which was included in Factor V. Therefore, Scale  
19 Items 16 and 24 were recategorized into Factor V. After recategorizing Factor I and Factor V, the  
20 Cronbach's alpha for Factor I became .93 (10 items, item-total correlation ranged from .57 to .81)  
21 and became .83 (3 items, item-total correlation ranged from .59 to .75) for Factor V (see Table 2).  
22 Factors II, III, and IV did not change their scale-item composition.

23       The mean inter-item correlation coefficients of the five recategorized factors ranged

1 from .62 to .81 in the current study while, in Lake's (2002) study, they ranged from .64 to .91  
2 (see Table 2). In the present study, the recategorized factors were highly correlated (see Table 1).  
3 The mean scores for Factors I–V were 3.58 ( $SD = .89$ ), 2.87 ( $SD = .73$ ), 3.78 ( $SD = .83$ ), 3.23  
4 ( $SD = .97$ ), and 3.53 ( $SD = .95$ ), respectively (see Table 2). The mean score for the entire scale  
5 was 3.51 ( $SD = .79$ ).

6 Both the current study and Lake's (2002) study identified five factors and demonstrated  
7 satisfactory reliabilities for each factor (see Table 2). However, the reliabilities of the derived  
8 factors in the current study were higher than the reliabilities in Lake's study. To compare the  
9 priori subscales in Lake's study and the derived factors from the current study, we created a  
10 cross-classification matrix (see Table 3). The matrix presents the data that best illustrate the  
11 difference between the results of Lake's study and the present study. In the present study, two  
12 factors (IV and V) included exactly the same scale items as in Lake's study; therefore, these  
13 factors retained the same names used in Lake's study. Factor II – *Nurse Manager Ability,*  
14 *Leadership, and Support of Nurses* (10 items) appeared to be a combination of items drawn from  
15 three of Lake's subscales. Because meanings of the 10 scale items in Factor II were related to  
16 leadership and support for nurses, Factor II in the present study also retained the same name used  
17 in Lake's study. Scale items of Factor III in the current study were part of scale items of Factor  
18 III in Lake's study. Therefore, Factor III was named the same as that in Lake's study: *Nursing*  
19 *Foundations for Quality of Care*. In the current study, the 10 scale items of Factor I were drawn  
20 from Factors I and III in Lake's study. Because the scale items also address staff development,  
21 Factor I in the present study was renamed, *Nurse Participation and Development*. In Lake's  
22 study, the five factors explained 48% of the total variance; in the present study, the five factors  
23 explained 59.12% of the common variance of the perception of practice environment.

## 1 Discussion

2 The present study's purpose was to test the reliability and validity of the PES-NWI among  
3 Asian nurses working in the United States. Results indicate the scale is satisfactory. Additionally,  
4 several similarities and differences are evident between the findings of this study and Lake's  
5 (2002) study. Although both studies identified the same number of factors, the present study  
6 reconstructed the scale items in three factors (I, II, and III) and renamed Factor I. In Lake's study,  
7 Factor III – *Nursing Foundations for Quality of Care* included the scale items 4 (“Active staff  
8 development or continuing education programs for nurses”), 14 (“High standards of nursing care  
9 are expected by the administration”), 18 (“A clear philosophy of nursing that pervades the  
10 patient care environment”), 19 (“Working with nurses who are clinically competent”), and 25  
11 (“A preceptor program for newly hired RNs”). Asian nurses perceive these five scale items as  
12 ways that help them learn and develop clinical skills; therefore, the items were categorized into  
13 the current study's Factor I – *Nurse Participation and Development* (see Table 3).

14 In Lake's (2002) study, Factor I – *Nurse Participation in Hospital Affairs* included scale  
15 items 11 (“A chief nursing officer who is highly visible and accessible to staff”), 15 (“A chief  
16 nurse officer equal in power and authority to other top-level hospital executives”), 21  
17 (“Administration that listens and responds to employee concerns”), and 28 (“Nursing  
18 administrators consult with staff on daily problems and procedures”). Because these four scale  
19 items are related to nurse administrators, they were included in the present study's Factor II –  
20 *Nurse Manager Ability, Leadership, and Support of Nurses*.

21 In Lake's (2002) study, Factor III – *Nursing Foundations for Quality of Care* included  
22 Scale Item 22 (“An active quality assurance program”). To an Asian nurse, nurse managers are  
23 responsible for developing a quality assurance program, which demonstrates their leadership role.

1 Therefore, in the present study, Scale Item 22 was categorized in Factor II – *Nurse Manager*  
2 *Ability, Leadership, and Support of Nurses*.

3 The current study’s reconstructions of scale items in Factors I–III (*Nurse Participation and*  
4 *Development; Nurse Manager Ability, Leadership, and Support of Nurses; and Nursing*  
5 *Foundations for Quality of Care*) may be due to different cultural orientations between Asian  
6 nurses, who belong to a collectivist culture, and American nurses, who are part of an  
7 individualist culture. In nursing practice, differences in cultural orientation contribute to  
8 differences in needs, satisfiers, and autonomy (Kirkman & Shapiro, 2001; Spangler, 2001).

9 A high degree of correspondence exists between the factors of the PES-NWI in Lake’s  
10 (2002) study and the scale’s derived factors in the current study. As presented in Table 3, the  
11 scale items in each derived factor in the current study show a “clustering” appearance, in which  
12 the greatest majority of items correspond to one or two of the priori subscales in Lake’s study.

### 13 Conclusion

14 Findings from the present study show the PES-NWI is a reliable and validated scale to  
15 measure the perception of practice environment among Asian nurses working in the United  
16 States. Factors derived in this study also correspond with factors in Lake’s (2002) PES-NWI  
17 scale-development study. However, three out of five derived factors were reconstructed, and one  
18 factor was renamed based on the meanings of scale items included in the factor. This  
19 reconstruction may be due to cultural differences between Asian nurses and American nurses.  
20 Thus, we suggest researchers and hospitals devote more attention to cultural perceptions of  
21 practice environment and provide additional support to assist Asian nurses to adapt to their new  
22 environment. Successful outcomes may help retain this growing population of foreign-born  
23 nurses and, in turn, alleviate the nursing shortage in the United States.

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Table 1

*Factor Loadings and Correlations Between Factors*

Item Number	Pattern/Structure Loading <sup>a</sup> in Current Study					Communality	Factor (Loading) in Lake's (2002) Study
	Factor I <sup>b</sup>	Factor II <sup>b</sup>	Factor III <sup>b</sup>	Factor IV <sup>b</sup>	Factor V <sup>b</sup>		
5	.98/.79					.70	I (.47)
17	.91/.87					.76	I (.51)
4	.83/.77					.62	III (.40)
6	.70/.77					.68	I (.52)
23	.62/.74					.57	I (.55)
18	.61/.80					.68	III (.44)
24	.51/.78				.37/.72	.70	V (.53)
16	.51/.74				.45/.74	.67	V (.65)
25	.48/.58					.38	III (.47)
27	.43/.72					.57	I (.42)
19	.40/.70	.35/.68				.55	III (.40)
14	.35/.69					.54	III (.42)
20		.93/.85				.72	II (.61)
10		.90/.83				.71	II (.67)
3		.69/.76				.65	II (.57)
21		.67/.82				.69	I (.51)
11		.59/.69		.34/.59		.57	I (.48)

22	.41/.76	.50/.78				.69	III (.48)
7		.47/.60				.38	II (.60)
13		.47/.77				.66	II (.55)
28		.35/.70				.59	I (.47)
15		.29/.49				.29	I (.41)
31			.94/.79			.67	III (.49)
30			.75/.71			.52	III (.45)
29			.64/.69			.49	III (.44)
26			.44/.66			.50	III (.45)
12				.58/.73		.61	IV (.73)
9				.54/.67		.52	IV (.71)
1				.49/.45	.37/.62	.54	IV (.50)
8				.33/.52		.45	IV (.47)
2					.88/.39	.69	V (.55)

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Explanation	47.07%	4.08%	3.16%	2.71%	2.10%
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Correlations between recategorized factors

Factor I	1.00				
Factor II	.82	1.00			
Factor III	.64	.61	1.00		
Factor IV	.67	.69	.55	1.00	
Factor V	.74	.67	.57	.62	1.00

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<sup>a</sup>Only pattern loadings higher than .30 and only the highest structure loadings are presented.

<sup>b</sup>Names of factors:

Factor I – *Nurse Participation and Development* (in current study) and *Nurse Participation in Hospital Affairs* (in Lake's 2002 study)

Factor II – *Nurse Manager Ability, Leadership, and Support of Nurses*

Factor III – *Nursing Foundations for Quality of Care*

Factor IV – *Staffing and Resource Adequacy*

Factor V: *Collegial Nurse-Physician Relations*

Table 2

*Categorization, Mean, and Reliability of Factors in the Current Study and in Lake's (2002) Study*

Factor <sup>a</sup>	Current Study					Lake (2002) Study				
	Scale item number	Mean ± SD <sup>b</sup>	α	Item-total correlation	Mean inter-item correlation	Scale item number	Mean ± SD <sup>b</sup> Magnet hospital	Nonmagnet hospital	α	Mean inter-item correlation
I	4, 5, 6, 14, 17, 18, 19, 23, 25, 27	3.58±.89	.93	.57-.81	.64	5, 6, 11, 15, 17, 21, 23, 27, 28	2.76±.47	2.44±.44	.83	.64
II	3, 7, 10, 11, 13, 15, 20, 21, 22, 28	2.87±.73	.92	.48-.79	.62	3, 7, 10, 13, 20	3.00±.59	2.68±.60	.84	.81
III	26, 29, 30, 31	3.78±.83	.80	.53-.66	.70	4, 14, 18, 19, 22, 25, 26, 29, 30, 31	3.09±.39	2.83±.36	.80	.67
IV	1, 8, 9, 12	3.23±.97	.81	.54-.72	.71	1, 8, 9, 12	2.88±.62	2.82±.55	.80	.91

V	2, 16, 24	3.53±.95	.83	.59-.75	.81	2, 16, 24	2.99±.52	2.65±.37	.71	.72
Entire	1 through 31	3.51±.79	.96	.49-.77	.49	1 through 31	2.95±.40	2.65±.37	.82	.69

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<sup>a</sup>Name of factors

Factor I – *Nurse Participation and Development* (in current study) and *Nurse Participation in Hospital Affairs* (in Lake’s 2002 study)

Factor II – *Nurse Manager Ability, Leadership, and Support of Nurses*

Factor III – *Nursing Foundations for Quality of Care*

Factor IV – *Staffing and Resource Adequacy*

Factor V: *Collegial Nurse-Physician Relations*

<sup>b</sup>In the Lake (2002) study, the Practice Environment Scale of the Nursing Work Index (PES-NWI) was a 4-point Likert scale; whereas, in the current study, the PES-NWI was modified to a 5-point Likert scale. Values higher than 2.5 indicate agreement in the Lake study; however, values higher than 3 indicate agreement in the current study.

Table 3

*Cross-Classification of the Perception of Practice of the Environment-Nursing Work Index*

	Derived Factors in Present Study				
	I. Nurse	II. Nurse manager	III. Nursing	IV. Staffing	V. Collegial
Factors in Lake's (2002) study	participation and development	ability, leadership, and support of nurses	foundations for quality of care	and resource adequacy	nurse-physician relations
I. Nurse participation in hospital affairs <sup>a</sup>	5, 6, 11, 15, 17, 21, 23, 27, 28	5, 6, 17, 23, 27	11, 15, 21, 28		
II. Nurse manager ability, leadership, and support of nurses <sup>b</sup>	3, 7, 10, 13, 20		3, 7, 10, 13, 20		
III. Nursing foundations for quality of care <sup>c</sup>	4, 14, 18, 19, 22, 25, 26, 29, 30, 31	4, 14, 18, 19, 25	22	26, 29, 30, 31	

IV. Staffing and resource adequacy<sup>d</sup>

1, 8, 9, 12

1, 8, 9, 12

V. Collegial nurse-physician relations<sup>d</sup>

2, 16, 24

2, 16, 24

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<sup>a</sup>Five scale items remained in Factor I, but four items were categorized to Factor II in the current study.

<sup>b</sup>All five scale items remained in Factor II in the current study.

<sup>c</sup>Four scale items remained in the Factor III, but five items were categorized to Factor I and one item was categorized to Factor II in the current study.

<sup>d</sup>Both studies had the same categorizations for Factor IV and Factor V.

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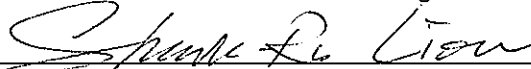
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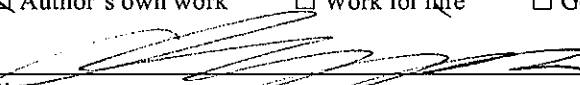
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