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Evaluation and Improvement of the Nurse Satisfactory Status in a Tertiary Hospital using the Professional Practice Environment Scale

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
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Literature Search F
Funds Collection G

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Background: The present study was performed to quantitatively examine nurse satisfaction, to investigate the associated factors influencing satisfaction, and to evaluate the effect of improvement measures based on these factors.





Material/Methods: A survey using the 38-item Chinese version of the Practice Environment Scale (CPPE-38) was performed in a university-affiliated tertiary hospital in Shanghai, China in 2013. Linear regression analysis was performed to screen for associated factors related to each CPPE-3 score and the total satisfaction score. Several improvement measures were established to improve nurse satisfaction, and the CPPE-38 survey was again performed in 2015 to evaluate the effect of these improvement measures.

Results: A total of 1,050 respondents were recruited in 2013, with a response rate of 87.6%. The total satisfaction score of the CPPE-38 was 2.99 ± 0.64 . The lowest score in a subscale of the CPPE-38 was 2.40 ± 0.59 for interpersonal interaction and the highest score was 3.15 ± 0.40 for internal work motivation. Work location was associated with scores for work motivation and total satisfaction, while the highest education degree was associated with scores for internal relationship and autonomy. The scores for internal work motivation, control over practice, interpersonal interaction, and internal relationship and autonomy were significantly improved in 2015 after two years of improvement efforts, while the total satisfaction score was not significantly different compared to the 2013 score.

Conclusions: Working location and education degree were two factors correlated with CPPE-38 scores in our hospital. Humanistic concerns, continuing education, and pay raise may improve the practice satisfaction of nurses.

MeSH Keywords: **Clinical Nursing Research • Job Satisfaction • Quality of Health Care**

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Background

There is growing evidence that occupational burnout has been widely present among nurses since the end of last century [1]. A patient-oriented nursing model requires high-quality care while at the same time may increase mental and physical stress in nurses [2]. A survey involving 711 hospitals showed that more than 40% of USA nurses were dissatisfied with their jobs, and the percentage of nurses who were planning to leave their jobs was more than 33% in England and Scotland and more than 20% in the USA [3]. Dissatisfaction may greatly reduce the quality of care and result in negative sequelae [4]. Chinese nurses may be facing even higher occupational stress than counterparts from other countries because of poor doctor-patient relationship and frequent violence against medical staff in hospitals [5,6]. Several studies have reported that more than 40% of nurses had emotional exhaustion or high-level burnout [7,8].

The quality of the nursing practice environment was considered to be a main factor associated with nurse recruitment and retention [9,10]. Therefore, the Practice Environment Scale has been widely used to quantitatively evaluate the job satisfaction of nurses [11,12]. The Chinese version of the Practice Environment Scale (CPPE-38) was translated in 2009 [13], and one study that included 573 participants from different hospitals showed that the satisfaction scores were very low in China [14]. Gender, clinical work duration, geographic location of the work place, and highest nursing qualification were demonstrated to be predictive factors of low satisfaction. However, this study included hospitals of different levels, and nurse satisfaction scores from a tertiary hospital were not specifically identified. In our present study, the satisfaction scores were studied in a university-affiliated tertiary hospital in Shanghai, China to investigate the associated factors and the change of satisfaction from 2013 to 2015.

Material and Methods

Study design

This study is a historical control study based on a paper questionnaire survey performed in 2013 and 2015. All nurses from Huashan Hospital, Fudan University were asked to complete the CPPE-38 anonymously at the end of 2013 and 2015. The questionnaire was conducted in the same general population, although the population sizes in the two years were different as a small proportion of nurses may have resigned or moved to other hospitals over the two years of the study. Linear regression analysis was performed based on the survey in 2013 to identify the potential factors correlated with each item and subscale of the CPPE-38. Multiple improvement measures were

then established to improve the satisfaction of nurses in 2014 and 2015. The scores of CPPE-38 in 2015 were compared with those in 2013 to evaluate the effects of these improvement measures. The study was approved by the Human Research Ethics Committee of Huashan Hospital, Fudan University.

Questionnaire setting

The main components of the questionnaire were the 38 items of the CPPE-38, which were divided into 5 subscales, including internal work motivation (10 questions), control over practice (6 questions), interpersonal interaction (7 questions), supportive leadership and handling conflict (10 questions), internal relationship and autonomy (5 questions) [14]. Other information in the questionnaire included gender, marital status, highest educational degree, age, years of being a nurse, years at the current hospital, years in the current unit, work unit, and job title.

Improvement measures

Several improvement measures were proposed and performed since the end 2013. First, a web-based communication platform was established to receive any comments or complaints from the nurses. Second, a psychological forum was offered twice a year to carry out psychological intervention in some special units based on the questionnaire and the problems exposed by the communication platforms. Third, continuing education was enhanced among the nurses and a certificate was established to authenticate their capacities. Finally, spiritual rewards were established to encourage internal motivation of nurses. Salary and benefits were raised based on the performance appraisals.

Statistical analyses

All statistical analyses were performed by the SPSS 16.0 (Chicago, IL, USA). The continuous data was expressed as mean \pm SD and the enumeration data was expressed as number (percentage). The potential associated factors with the scores of CPPE-38 were screened using the backward method of linear regression analysis. The dependent factor was the subscale score, and the total score of the CPPE-38 and the independent factors included all the demographic data. The CPPE-38 scores in 2013 and 2015 were compared using the student's *t*-test. Comparison of continuous data among multiple groups was performed using the ANOVA test. A $p < 0.05$ was considered statistically significant.

Results

A total of 1,050 respondents were recruited out of 1,198 nurses in 2013, with a response rate of 87.6%. The general demographic characteristics are shown in Table 1.

Table 1. Demographic characteristics of participants.

Parameters	Value [N (%)]	
Gender		
Male	7	(0.7)
Female	1043	(99.3)
Age		
20–29	620	(59.0)
30–39	302	(28.8)
40–50	103	(9.8)
50	25	(2.4)
Marriage		
Single	358	(34.1)
Married	676	(64.4)
Divorced	13	(1.2)
Widow	3	(0.3)
Education degree		
Lower than Diploma	66	(6.3)
Diploma	750	(71.4)
Bachelor	232	(22.1)
Higher than master	2	(0.2)
Years of being a nurse		
1–5	359	(34.2)
6–10	323	(30.8)
11–15	227	(21.6)
>15	141	(13.4)
Years at the current hospital		
1–5	405	(38.6)
6–10	310	(29.5)
11–15	219	(20.9)
>15	116	(11.0)
Work location		
Ward	593	(56.5)
ICU	154	(14.7)
ER	62	(5.9)
OR	80	(7.6)
PACU	9	(0.9)
Other	152	(14.5)
Position		
Registered Nurse	424	(40.4)
Registered Professional Nurse	563	(53.6)
Nurse Practitioner	5	(0.5)
Assistant Head Nurse	58	(5.6)

The CPPE-38 scores of each item and the subscale scores, as well as total satisfaction in 2013 are listed in Table 2. The total satisfaction score was 2.99 ± 0.64 . Among the five subscales, the lowest score was 2.40 ± 0.59 in interpersonal interaction and the highest score was 3.15 ± 0.40 in internal work motivation. Several potential associated factors were identified by linear regression analysis (Table 3). Work unit was associated with internal work motivation and total satisfaction. Educational degree was associated with internal relationship and autonomy. Nurses from the operating room and post-anesthesia care unit had the lowest scores in internal work motivation and total satisfaction (Table 4). Nurses with an educational degree higher than a masters degree had the highest score for internal relationship and autonomy (Table 5).

The CPPE-38 survey was performed again at the end 2015, with a total of 1,085 respondents. The results showed significantly higher scores in the subscales of internal work motivation, control over practice, interpersonal interaction, and internal relationship and autonomy. But no significant difference was observed in the scores for supportive leadership, handling conflict, or the total satisfaction score (Table 6).

Discussion

Our present study identified several significant associated factors in the CPPE-38 scores. With the introduction of improvement measures, including web-based communication platform, psychological forum, continuing education, psychological rewards, and income elevation, we observed increases in the scores for internal work motivation, control over practice, interpersonal interaction, and internal relationship and autonomy.

A positive practice environment is critical to improving the quality of nursing care and reducing mortality according to the American Nurses Credentialing Center [15]. The Practice Environment Scale is one of the most widely used scales in evaluating job satisfaction of nurses, and prior to 2010 had been reported by more than five countries and translated into three languages. However, the Practice Environment Scale has seldom been reported in studies from mainland China. A cross-sectional study performed by Cao et al. [14] recruited 435 paper-based and 163 online-based questionnaires and reported a mean score ranging from 2.66 to 3.05. All subscales, excluding work motivation, had scores lower than 3.0. The average score in our present study was 2.99 ± 0.64 and only two subscales had scores lower than 3.0, including control over practice and interpersonal interaction. Organization has been reported as one of the factors associated with the scores and the respondents from a level-three hospital account for only 58.0% among all the participants in the Cao et al. study. This might be the reason why the present study had a higher score.

Table 2. Mean scores of the CPPE-38 in 2013.

Item	Mean score
Internal work motivation	3.15±0.40
26 All contribute from their experience, expertise to effect high-quality solution	3.09±0.65
29 My opinion of myself goes up when I work in this facility	3.09±0.64
30 I feel a great sense of personal satisfaction for the work I do	3.36±0.61
31 I feel a high degree of personal responsibility for the work I do	3.28±0.64
32 I have challenging work that motivates me to do the best job I can	3.22±0.63
33 Working on this unit gives opportunity to gain new knowledge and skills	3.19±0.63
34 I'm motivated to do well because I'm empowered by work environment	3.11±0.70
35 Working in this environment increased my sense of professional growth	3.08±0.68
37 Staff are sensitive to diverse patient populations whom they serve	3.14±0.58
38 Staff are respectful of their unit's diverse health care team	3.22±0.59
Control over practice	2.70±0.58
3 Freedom to make important patient care and work decisions	2.72±0.75
6 Adequate support services allow me to spend time with patients	2.82±0.76
7 Enough time and opportunity to discuss patient care problems with other staff	2.76±0.76
8 Enough staff to provide quality patient care	2.48±0.91
10 Enough staff to get the work done	2.40±0.87
36 Staff have access to necessary resources to provide culturally competent care	2.99±0.67
Interpersonal interaction	2.40±0.59
14 Not being placed in a position of having to do things against my professional judgment	2.52±0.93
18 This unit doesn't get cooperation from other health units and facilities	2.27±0.87
19 Other units seem to have a low opinion of this unit	2.21±0.91
20 Inadequate working relationships with other clinical areas limit effectiveness of work on this unit	2.46±0.93
21 When staff disagree, they ignore the issue, pretending it'll go away	2.21±0.88
22 Staff withdraw from conflict	2.59±0.89
27 Disagreements between staff are ignored or avoided	2.54±0.82
Supportive leadership and handling conflict	3.14±0.39
9 A manager who is a good manager and leader	3.44±0.68
11 Opportunity to work in a specialized work environment	2.82±0.74
12 Manager who backs up staff in decision-making, even in conflict with medical practitioner	3.22±0.70
13 GPs and practice staff have good relationships	3.13±0.71
15 I get information on patient's status when I need it	3.09±0.62
16 When patient's status changes, I get relevant information quickly	3.17±0.61
23 All points of view considered in finding best solution to problem	3.09±0.68
24 All staff work hard to arrive at best possible solution	3.21±0.60

Table 2 continued. Mean scores of the CPPE-38 in 2013.

Item	Mean score
25 Staff involved don't settle dispute until all are satisfied with decision	3.19±0.61
28 Staff involved settle disputes by consensus	3.04±0.60
Internal relationship and autonomy	3.12±0.49
1 Leadership supportive to staff	3.13±0.67
2 My discipline (i.e. nursing) controls its own practice	3.38±0.61
4 A lot of team work between physicians and staff	3.02±0.65
5 Patient care assignments that foster continuity of care	3.19±0.59
17 This unit has constructive relationships with other groups in this area	2.91±0.73
Total satisfaction	2.99±0.64

Table 3. Linear regression analyses for each subscale and total satisfaction.

Dependent variable	Included variable	Coefficients	95% CI	P value
Internal work motivation	Constant	3.12	3.07, 3.16	<0.001
	Work unit	0.018	0.001, 0.034	0.034
Control over practice	Constant	2.596	2.479, 2.712	<0.001
	Marriage	0.061	-0.005, 0.127	0.071
Interpersonal interaction	Constant	2.40	2.37, 2.44	<0.001
Supportive leadership and handling conflict	Constant	3.15	3.13, 3.18	<0.001
Internal relationship and autonomy	Constant	3.12	3.05, 3.20	<0.001
	Education	0.036	0.003, 0.070	0.034
	Years at the current hospital	-0.049	-0.099, 0.001	0.054
Total satisfaction	Constant	2.89	2.81, 2.96	<0.001
	Education degree	0.035	-0.004, 0.074	0.082
	Work unit	0.024	0.002, 0.045	0.035

Table 4. The score of internal work motivation and total satisfaction in different work units.

Work unit	Score of internal work motivation	Total satisfaction
Ward	3.16±0.35	3.00±0.65
ICU	3.07±0.37	2.84±0.55
ER	3.20±0.39	3.08±0.45
OR	2.94±0.60	2.79±0.79
PACU	2.90±0.40	2.78±0.83
Other	3.32±0.38	3.21±0.63

Table 5. The score of internal relationship and autonomy in nurses of different education degree.

Highest degree	Score of internal relationship and autonomy
Lower than Diploma	3.1±0.5
Diploma	3.1±0.5
Bachelor	3.2±0.5
Higher than master	3.8±0.3

Table 6. Comparison of CPPE-38 scores in 2013 and 2015.

Item	2013	2015	P
Internal work motivation	3.15±0.40	3.22±0.64	0.005
Control over practice	2.70±0.58	2.82±0.78	<0.001
Interpersonal interaction	2.40±0.59	2.58±0.81	<0.001
Supportive leadership and handling conflict	3.14±0.39	3.10±0.72	0.12
Internal relationship and autonomy	3.12±0.49	3.27±0.68	<0.001
Total satisfaction	2.99±0.64	3.00±0.76	0.74

Our multiple regression analysis found that nurses from the operating room, post-anesthesia care unit, and intensive care unit had the lowest satisfaction scores. The operating department has been considered a frequent source of adverse events and work stress. The intensive care unit is also a complicated unit with low job satisfaction among the nurses. A survey performed by Lai et al. [16] showed that 48.9% of nurses from the intensive care unit intended to leave their jobs. Several issues has been proposed as important regarding the current status of Chinese nurses, including nursing shortages, inadequate salary income, little support from managers, and less professional autonomy [17]. Therefore, we paid more attention to the psychological and living status of nurses from these special units by establishing a web-based communication platform and a psychological forum. Dissatisfaction on income is common in Chinese hospitals and the employment status has been reported to be a critical issue influencing the job satisfaction of nurses [14]. In our study group, the income and benefits of a relatively small proportion of nurses were provided by the government or the university while most of the nurses were contract-based employees whose benefits might be less. Thus we raised both the salary income and social benefits among the contract-based employees. Finally, our improvement measures were proven to be effective according to the increase in scores of the CPPE-38 survey two years later.

Educational degree was associated with internal relationship and autonomy. Inadequate education might lead to less confidence and professional autonomy in caring for patients during practice. Support from the nurse managers and doctors might increase autonomy [18], thus we establish an online communication platform to receive any comments or complaints from

the nurses who might be facing a difficult problem. They could receive support from experienced nurses, managers, and chief physicians. Continuing education was also considered essential to improve the autonomy of nurses. Davies et al. reported a statistically significant association between autonomy and educational preparation in qualified staff undertaking continuing education and having contact with educational centers [19]. Holm et al. showed that implementation of a phased educational approach could improve communications between healthcare staff and improve job satisfaction in a developing country [20].

There were several limitations in the present study. First, this was a single center study recruiting nurses from a university-affiliated tertiary hospital and the results may not be representative of all hospitals in China. A multi-center investigation should be performed to evaluate the effects of the improvement measures in improving the satisfaction status of nurses. Second, we did not correlate the improvement of CPPE-38 scores with the quality of care. Further studies should be performed to evaluate the impact of the improvement measures on patient and hospital outcomes.

Conclusions

Working location and educational degree were two factors influencing the scores of the 38-item Chinese version of Practice Environment Scale. The improvement measures, including web-based communication platform, psychological forum, continuing education, psychological rewards, and income elevation, may improve the satisfaction of nurses. A multi-center study should be performed to evaluate the effects of these measures.

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