

ORIGINAL ARTICLE

# Factors associated with core competencies of emergency-room nurses in tertiary hospitals in China

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## Abstract

**Aim:** Quantitative studies using validated questionnaires on core competencies of emergency nurses in China are rare and the baseline core competencies must first be evaluated before improvisations to the competencies can be implemented. This study aimed to investigate the factors potentially involved in the level of core competencies of emergency nurses from tertiary hospitals in northwest China.

**Methods:** In this cross-sectional study, male and female emergency nurses ( $n = 277$ ) from tertiary hospitals of northwest China were enrolled to complete the Competency Inventory for Registered Nurses (CIRN) questionnaire comprising of a total of seven dimensions with 58 items. General self-efficacy and perceived stress were also evaluated. Pearson correlation test and multivariate stepwise linear regression analysis were performed to assess the association between various factors associated with core competencies.

**Results:** Senior nurses had higher CIRN scores than junior nurses ( $p < .001$ ). Married and widowed nurses had higher CIRN scores than unmarried and divorced nurses ( $p = .008$ ). Nurses satisfied with their career had better CIRN scores than those who were dissatisfied ( $p < .001$ ). CIRN scores were correlated with age ( $r = .356, p < .001$ ), working years ( $r = .374, p < .001$ ), and the general self-efficacy scale ( $r = .547, p < .001$ ). Multivariable stepwise linear regression analysis showed that higher professional titles and job satisfaction were independently associated with higher CIRN scores (both  $p < .001$ ).

**Conclusions:** Emergency nurses from tertiary hospitals of northwest China with senior titles and job satisfaction had high CIRN scores which necessitates empowering the junior nurses by way of education and training programs to gain higher core competencies in order to deliver better nursing care to patients.

## KEYWORDS

core competence, emergency, nursing, self-efficacy

## 1 | INTRODUCTION

Based on the definition by the International Council of Nurses (ICN), core nursing competencies refer to the

effective application of a combination of knowledge, skill, and judgment demonstrated by an individual in his/her daily practice or job performance (Clark, Raffray, Hendricks, & Gagnon, 2016; Fukada, 2018). According to the

US Emergency Nurse Association, emergency nurse core competencies include direct care (the ability to perform actual nursing care), consultation (the ability to evaluate a case), systems leadership (which enables leaders to create the conditions where people at all levels can work productively to their potential), collaboration (the ability to work as a team), coaching (the ability to pass knowledge to those lacking it), research (the ability to participate in the evolution of knowledge, concepts, management, and processes), and ethical decision-making/moral agency/advocacy (the ability to take moral decisions or mitigate an ethically difficult situation) (Clark et al., 2016). These competencies can be summarized into a framework suggested by Lewandowski and Adamle (2009): (a) managing the care of the complex and/or vulnerable patient; (b) educating and supporting multidisciplinary staff; and (c) facilitating innovation and change within healthcare systems. Some studies also evaluated models and training programs for emergency nursing core competencies (Daouk-Oyry et al., 2017; Plath, Wright, & Hocking, 2017).

Core competencies in nurses also includes stress management or perceived stress which is a basic behavioral trait, and self-development through constant learning or self-efficacy which can be classified under clinical practice skill (Fukada, 2018). Self-efficacy and perceived stress might be involved in the application of core competencies. While self-efficacy is an individual's belief in their innate ability to achieve goals, perceived stress is a notion that demands placed upon a person exceed their ability to cope. Various studies have concluded an increase in self-efficacy and decrease in perceived stress can be brought about by enhancing nurses' personal resources, improving personal and organizational wellbeing, developing novel coping strategies, introducing worksite health promotion programs and so on. (Jordan, Khubchandani, & Wiblishauser, 2016; Molero Jurado et al., 2019; Pérez-Fuentes et al., 2019).

Using the framework of ICN, the structure of core competencies scale for nurses was studied and a systematic and efficient evaluation system for core competencies of nurses, namely the Competency Inventory for Registered Nurse (CIRN) was established (Fan, Qi, & Xi, 2012; M. Liu, Kunaiktikul, Senaratana, Tonmukayakul, & Eriksen, 2007). This system includes seven dimensions and 58 items based on the core competency framework issued by the ICN; it has been validated to be an objective tool for the assessment of the core competencies of registered nurses in various areas of clinical practice and specialties (M. Liu et al., 2007; Y. Liu & Aungsuroch, 2018). This tool was also shown to have a cross-cultural applicability (M. Liu, Yin, Ma, Lo, & Zeng, 2009).

Different non-validated questionnaire-based survey studies have evaluated the core competencies of emergency nurses and have concluded that core competency-based training programs could be improved and that nurses' active participation in such educational programs is required (Ghanbari, Hasandoost, Lyili, Khomeiran, & Momeni, 2017; Lam et al., 2018; H. Y. Park & Kim, 2017). A previous study on public health nurses using a non-validated questionnaire revealed low scores in most domains of competency levels (Zahner & Henriques, 2014). A study on intensive care nurses in China revealed low competencies related to nurse-doctor collaboration and application of research to practice and suggested that long-term repetitive training programs were necessary to improve core competences (Wei, Niu, & Ge, 2018). There have been several studies in China that have aimed at developing sets of core competencies required for specialist care (Ren et al., 2019), critical care medicine training (Hu et al., 2016), testing psychometric properties of emergency nurses (Fan, Gui, Xi, & Qiao, 2016), disaster nursing competency framework (Li, Li, Yang, & Xu, 2016). But quantitative studies using validated questionnaires on core competencies of emergency nurses in China are lacking; validated questionnaires can be used to assess the baseline core competencies thereby helping to improve nurses' abilities and skill-sets leading to superior management of patient care. Due to its inherent rigorous nature, the results of a validated questionnaire could yield a better prospect at enhancing the essential capabilities compared to the results of a non-validated questionnaire. Moreover, due to rapid development in the healthcare system, China faces demands for expert nurses with high levels of core competencies (Gao, Hou, & Liu, 2016). Therefore, this study aimed to explore the factors involved in the level of core competencies of emergency nurses in Chinese tertiary hospitals using a validated questionnaire (CIRN) developed by M. Liu et al. (2007).

## 2 | METHODS

### 2.1 | Study design

This cross-sectional and correlational study was conducted between May 2014 and September 2015, and 296 male and female emergency nurses were approached.

### 2.2 | Setting and sample

Nine tertiary hospitals (Ningxia People's Hospital, People's Hospital of Inner Mongolia Autonomous Region,

Shaanxi Provincial People's Hospital, Shanxi Grand Hospital, Inner Mongolia Medical University Affiliated Hospital, the First Affiliated Hospital of Xinjiang Medical University, the Second Hospital of Lanzhou University, Baotou Central Hospital of Inner Mongolia, and Wulanchabu Central Hospital of Inner Mongolia) were randomly selected from five provinces (Ningxia, Inner Mongolia Autonomous Region, Shaanxi, Xinjiang and Shanxi) in northwestern China for participation. Only tertiary hospitals were selected because they offer high-level specialized healthcare services. The levels of nursing offered in these hospitals are high as the average nursing time ranges from 0.9–1.1 /days/patient.

The inclusion criteria were: (a) registered nurses with designations of staff nurse, nurse practitioner, chief nurse and deputy director; and (b) >1 year of experience in the emergency care unit. The exclusion criteria were: (a) retired nurses; or (b) trainee nurses. The scale adopted from the CIRN (Liu et al., 2007) was used to evaluate the core competence of nurses.

### 2.3 | Ethics considerations

This study was approved by the Ethics Committee of the Inner Mongolia Medical University Affiliated Hospital, (approval number 2015006) and performed in accordance with the ethical standards laid down in an appropriate version of the Declaration of Helsinki (as revised in Brazil 2013). All the participants provided written informed consent.

### 2.4 | Measurements/instruments

The CIRN comprises of a total of seven dimensions with 58 items and includes 10 items for critical thinking/research, nine items for clinical nursing care ability, 10 items for leadership, eight items for human relationship, eight items for legal and ethics, six items for professional development, and seven items for education and consultation. Each item is made of a Likert five-point scale (0 for no competency, 1 for a little competency, 2 for moderate competency, 3 for enough competency, and 4 for very competent). Each dimension is represented by the sum of the score of each item divided by the number of items. The overall score is calculated as the sum of all scores of all items divided by the number of all items. Higher scores show stronger competency. The Cronbach's alpha for the questionnaire was .88 (ranging from .79 to .95 for each dimension). The item content validity was .85 (Fan et al., 2012; M. Liu et al., 2007; Wang, Hu, & Liu, 2001). The questionnaire

was translated to Chinese language by two independent professional medical translators, and the adequacy was verified by a third professional translator (Wang et al., 2001).

General self-efficacy was evaluated using the Chinese version of the general self-efficacy scale (based on the general self-efficacy scale designed by Schwarzer et al., 1997 and translated and revised by Wang et al., 2001). This 10-item psychometric scale assesses optimistic self-beliefs to cope with a variety of difficult demands in life and uses Likert four points scoring; it has reliability of .83 and validity of .87, respectively. Perceived stress was evaluated using the Chinese version of the Perceived Stress Scale, which has reliability and validity of .78 and .78, respectively (Yang & Huang, 2003). Perceived Stress Scale contains 14 items. Each item on the General Self-efficacy test and perceived stress test was evaluated by using general self-efficacy scale – Schwarzer (GSES) and Perceived Stress Scale (PSS), respectively.

### 2.5 | Data collection/procedure

Socio-demographic information such as age, gender, work experience, nationality, job type, professional title (based on the National Unified Examination, with appropriate certificates), professional duty, education (based on certificates), and marital status were collected from all the participants. Before commencement of the study, each participant was informed of the purpose of the study and assured that they had the right to refuse to participate or withdraw from the study at any stage. Anonymity and confidentiality of all participants was maintained. The questionnaires were distributed by members of the research team. Before issuing the questionnaire, nurses from the nursing and emergency departments gave adequate explanation about the purpose and significance of the investigation, and issued instructions about filling the questionnaire, thereby ensuring there was no ambiguity for answering the questions. Participants answered the questionnaire anonymously and hence there was no infringement on patient privacy. After completion, the questionnaires were collected immediately by the research team. A questionnaire was considered invalid if more than 10% of the items were not answered.

### 2.6 | Data analysis

Data are presented as mean  $\pm$  standard deviation (SD) and compared using independent samples *t* test or analysis of variance (ANOVA) with the least significant difference (LSD) post hoc test, as appropriate. Categorical

**TABLE 1** Socio-demographic data, job characteristics and CIRN scores of emergency nurses ( $N = 277$ ) in tertiary hospitals in China

Variable	<i>n</i> (%)	CIRN scores, mean $\pm$ SD	F/t	<i>p</i>
Age (years)				
≤30	184(66.4)	163.34 $\pm$ 26.68	−4.070	<.001***
>30	93(33.6)	179.43 $\pm$ 33.33		
Gender				
Male	32 (11.6)	167.19 $\pm$ 27.80	0.311	.756
Female	245 (88.4)	168.94 $\pm$ 30.33		
Ethnic group				
Han	245 (88.4)	168.18 $\pm$ 30.67	0.614	.689
Hui	19 (6.8)	173.37 $\pm$ 19.27		
Man	3 (1.1)	169.00 $\pm$ 51.97		
Mongolian	3 (1.1)	191.67 $\pm$ 36.77		
Uighur	6 (2.2)	169.83 $\pm$ 16.87		
Kazaks	1 (0.4)	142.00 $\pm$ 0.00		
Professional title				
Staff nurse	120 (43.3)	166.71 $\pm$ 27.71	7.186	<.001***
Nurse practitioner	117 (42.2)	164.63 $\pm$ 29.41		
Chief nurse	30 (10.8)	182.20 $\pm$ 33.49		
Deputy director	10 (3.6)	200.80 $\pm$ 25.80		
Work experience (years)		7.12 $\pm$ 6.32	18.74	<.001***
Education				
Secondary technical school	6 (2.2)	184.17 $\pm$ 18.69	1.270	.285
Junior college	91 (32.8)	169.88 $\pm$ 31.59		
Undergraduate	178 (64.2)	167.97 $\pm$ 29.34		
Master	2 (0.7)	139.00 $\pm$ 46.67		
Average monthly income (RMB)				
1,000–3,000	22 (7.9)	162.77 $\pm$ 32.45	1.109	.346
3,001–5,000	145 (52.3)	167.17 $\pm$ 27.60		
5,001–7,000	71 (25.6)	173.85 $\pm$ 31.57		
> 7,000	39 (14.1)	168.64 $\pm$ 33.99		
Marital status				
Married	165 (59.6)	171.15 $\pm$ 31.99	4.052	.008**
Unmarried	106 (38.3)	164.63 $\pm$ 25.17		
Divorced	4 (1.4)	150.00 $\pm$ 33.83		
Widowed	2 (0.7)	225.50 $\pm$ 9.19		
Degree of family support				
Yes	225 (81.2)	170.64 $\pm$ 30.25	2.528	.082
No	12 (4.3)	157.00 $\pm$ 23.78		
No opinion	40 (14.4)	161.60 $\pm$ 28.99		
Degree of job satisfaction				
Very satisfied	53 (19.1)	186.25 $\pm$ 30.78	16.981	<.001***
Satisfied	139 (50.2)	173.16 $\pm$ 27.87		
Neutral	79 (28.5)	151.35 $\pm$ 21.81		
Unsatisfied	5 (1.8)	149.00 $\pm$ 36.22		
Very unsatisfied	1 (0.4)	99.00 $\pm$ 0.00		

**TABLE 1** (Continued)

Variable	<i>n</i> (%)	CIRN scores, mean $\pm$ SD	F/t	<i>p</i>
Received training in specialized knowledge of emergency				
Yes	215 (77.6)	170.13 $\pm$ 2.04	1.439	.151
No	62 (22.4)	163.92 $\pm$ 3.80		
Training or learning methods of specialized knowledge of emergency				
Systematic training	189 (68.2)	169.95 $\pm$ 29.84	2.733	.067
Non-systematic training	60 (21.7)	170.73 $\pm$ 28.11		
Others	28 (10.1)	156.29 $\pm$ 33.10		
Training or learning time of specialist knowledge of emergency (week)				
< 1	38 (13.7)	160.82 $\pm$ 35.49	1.543	.216
1–4	128 (46.2)	169.91 $\pm$ 30.37		
> 4	111 (40.1)	170.10 $\pm$ 27.30		

Abbreviations: CIRN, Competency Inventory for Registered Nurses; SD, standard deviation; RMB, renminbi (Chinese currency).

\*\* $p < .01$ ; \*\*\* $p < .001$ .

data are presented as frequencies. Pearson correlation test was used for univariate analysis and the correlations between the CIRN score and age, working time, years of working, general self-efficacy scale score, and perceived stress score were examined. Multivariate stepwise linear regression analysis was conducted using the CIRN score as the dependent variable. The independent variables were those with  $p$  values  $< .05$  in univariate analyses. SPSS Version 20.0 (IBM Corp., Armonk, NY, USA) was used for statistical analysis. Two-sided  $p$  values  $< .05$  were considered statistically significant.

### 3 | RESULTS

Out of the total of 296 participants contacted for the study, 285 of them responded, and eight questionnaires were deemed as being disqualified due to inadequate responses and hence were excluded. Finally 277 questionnaires were collected from the participants, and the effective response rate was 93.6%. Socio-demographic data, job characteristics and CIRN scores of the participants are presented in Table 1. The mean age of the participants was  $29.44 \pm 5.69$  years; the majority of the participants were females and 88.4% were of Han ethnicity. The average nursing experience was  $7.12 \pm 6.32$  years. Senior nurses (chief nurses and deputy directors) had higher CIRN scores than junior nurses ( $p < .001$ ) which correlated with the work experience in which nurses with more work experience had higher CIRN scores ( $p < .001$ ). Married and widowed nurses had higher CIRN scores than unmarried and divorced nurses ( $p = .008$ ). Nurses satisfied with their career had better

CIRN scores than those who were unsatisfied ( $p < .001$ ). Gender, nationality, education, average monthly income, degree of family support, whether they received specialized emergency training or not, whether they received systematic emergency training or not, and the emergency training time were not associated with CIRN scores. Results of the GSES and PSS are presented in Table 2. There was significant differences in General Self-Efficacy among the nurses with different professional titles. The mean scores of Core Competence, General Self-Efficacy and Perception Stress of all the participants are shown in Table 3. Pearson correlation analysis showed that CIRN scores were correlated with age ( $r = .356$ ,  $p < .001$ ), working years ( $r = .374$ ,  $p < .001$ ), and the general self-efficacy scale ( $r = .547$ ,  $p < .001$ ) (Table 4). The multivariable stepwise linear regression analysis showed that professional title and the degree of job satisfaction were independently associated with CIRN ( $\beta = .21$ ,  $p < .001$ ; and  $\beta = -.44$ ,  $p < .001$ , respectively) (Table 5).

### 4 | DISCUSSION AND CONCLUSIONS

This study aimed to investigate the factors potentially involved in the levels of core competencies of emergency nurses from tertiary hospitals in China. The results suggest that emergency nurses from tertiary hospitals in northwest China with seniority and those satisfied with their job had high CIRN scores. CIRN scores were correlated with age, working years, and the general self-efficacy scale.



**TABLE 2** Comparison of general self-efficacy and perceived stress among emergency nurses ( $N = 277$ ) with different professional titles

Professional titles	$n$	General self-efficacy, mean $\pm$ SD	Perception stress, mean $\pm$ SD
Staff nurse	120	27.13 $\pm$ 5.79	42.38 $\pm$ 7.46
Nurse practitioner	117	26.68 $\pm$ 5.84	44.21 $\pm$ 8.00
Chief nurse	30	29.93 $\pm$ 5.41	44.27 $\pm$ 6.08
Deputy director	10	30.60 $\pm$ 7.40	45.80 $\pm$ 5.47
F value		3.571	1.654
p value		.015	.177

**TABLE 3** Core competence, general self-efficacy, perception stress score (mean  $\pm$  SD) among emergency nurses ( $N = 277$ ) in tertiary hospitals in China

Items	Score
Core competence score	168.74 $\pm$ 30.00
Legal and ethics	25.36 $\pm$ 4.10
Human relationship	24.02 $\pm$ 4.05
Leadership	29.61 $\pm$ 5.17
Professional development	16.73 $\pm$ 3.58
Education and consultation	19.77 $\pm$ 4.59
Clinical nursing care ability	25.81 $\pm$ 5.04
Critical thinking/research	27.44 $\pm$ 5.82
General self-efficacy score	27.37 $\pm$ 5.91
Perception stress score	43.48 $\pm$ 7.53

Among nurses, the length of work experience significantly influenced the development of competence. On a visual analog scale, highest competence was found in those with the longest work experience while the younger nurses had the lowest competence (Meretoja, Numminen, Isoaho, & Leino-Kilpi, 2015). Moreover, a study that evaluated experienced nurses' evaluation of new registered nurses showed that the latter lacked in essential competencies such as clinical and technical skills, critical thinking and problem solving, working independently and assessment procedures (Missen, McKenna, Beauchamp, & Larkins, 2016), which emphasizes the fact that work experience takes precedence in core competency levels. With work experience, nursing skills and knowledge develop over the years. Our study corroborates with the previous study in that we found significant differences in CIRN scores among nurses with different professional titles; deputy directors and chief nurses (i.e., those with the highest working experience)

**TABLE 4** Associations between CIRN scores and job characteristics in emergency nurses ( $N = 277$ ) in tertiary hospitals in China

Variables	Mean $\pm$ SD	Score	
		Pearson correlation	p
Age, years	29.44 $\pm$ 5.69	0.356	<.001***
Working time, hours	07.00 $\pm$ 0.00	1	-
Years of working, years	7.12 $\pm$ 6.32	0.374	<.001***
General self-efficacy scale	27.37 $\pm$ 5.91	0.547	<.001***
Perceived stress	43.48 $\pm$ 7.53	0.013	.834

Abbreviations: CIRN, Competency Inventory for Registered Nurses; SD, standard deviation.

\*\*\* $p < .001$ .

**TABLE 5** Multivariate stepwise linear regression analysis of factors influencing the CIRN scores among emergency nurses ( $N = 277$ ) in tertiary hospitals in China

Influential factor	B	SE	$\beta$	t value	p value
Constant	192.54	5.84	-	32.95	<.001***
Degree of job satisfaction	-17.72	2.11	-.44	-8.38	<.001***
Professional title	8.08	2.01	.21	4.03	<.001***

Note:  $F = 42.090$ ,  $p < .001$ ,  $R = .485$ ,  $R^2 = .235$ .

\*\*\* $p < .001$ .

Abbreviations: B, partial regression coefficient; SE, standard error;  $\beta$ , standard regression coefficient.

had the highest CIRN scores. Since evaluation of nurses' core competencies plays an important role in their professional promotion, it can be justified that nurses with higher designations would have higher CIRN scores.

The results of the present study suggest that job satisfaction was associated with higher CIRN scores in emergency nurses. Competent nurses are more likely to perform their tasks adequately and to be appreciated by their supervisors, increasing their self-esteem and job satisfaction as previously shown (Ye, 2011). A previous study in China showed highly competent nurses with average job satisfaction (Wu et al., 2018); this differs from our study likely due to the sample population which included nurses from all the medical departments. Newly graduated nurses have a higher chance of job dissatisfaction (Park, Lee, & Cho, 2012). A Korean study also showed that nursing competency of nurses was associated with job satisfaction (Ha & Choi, 2010), supporting the present study. Unfortunately, the present study was cross-sectional and could not determine the cause-to-effect relationships, such as job satisfaction leading to better core competencies or vice versa. Nurses who are dissatisfied with their jobs often feel they are working in

a dysfunctional system which they are unable to change, leading to a feeling of powerlessness that affects the quality of their tasks and their self-esteem (Hall, Moore, & Barnsteiner, 2008), which are attitudes associated with low CIRN scores. Moreover, excessive workload, lack of respect and recognition of their work, strained relationship with coworkers along with fewer professional opportunities are reported to contribute to low job satisfaction among intensive care unit nurses in China (Tao, Ellenbecker, Wang, & Li, 2015). Another study from Shanghai showed that lack of rewards, interactions, praise and recognition, and responsibilities were predictors of nurses' intentions to leave their job (C. Liu et al., 2012). Hence, implementation of competency-based management can increase nurse job satisfaction (Chang, Yang, & Yuan, 2014).

General self-efficacy in this study was associated with higher CIRN scores. It is seen that job satisfaction and self-efficacy leads to lower attrition (De Simone, Planta, & Cicotto, 2018) and, self-efficacy, competency as well as professional commitment were found to be higher which can contribute to better quality of nursing care (Tsai, Tsai, Chen, & Lee, 2014). The results of this study showed that CIRN scores of married nurses was higher than that of unmarried nurses as seen in another study (Karami, Farokhzadian, & Foroughameri, 2017). Marital status could affect professional knowledge and skills (Han & Chung, 2015). Contrasting results have been reported which showed that the core competency and marital status were not significantly associated (Adib-Hajbaghery & Zehtabchi, 2014; Ebrahimi, Hosseinzadeh, Zaghari Tefreshi, Hosseinzadeh, & Asghari Jafarabadi, 2013). A plausible cause for the effect of marital status on competency could be related to the person's cultural, socio-economic background, and personal traits. Although lower competency has been reported to be associated with perceived stress (Komeili-Sani, Etemadi, Boustani, Bahreini, & Hakimi, 2015), our results did not show any correlation between the two factors.

Usually, higher education is associated with higher degrees of competency (Hewitt, Roye, & Gebbie, 2014; Liu et al., 2007; Liu et al., 2009), but no significant association was observed in the present study possibly because of underdeveloped economic conditions of northwest China. Additionally, in our study, nurses with advanced degrees being recent graduates had limited working experience compared to nurses with lower education degrees but with vast experience. Working experience in many cases is directly associated with age, and the present study showed that older nurses had higher scores of core competencies in all dimensions. These relationships warrant further studies.

This study is not without limitations. The self-assessment method may be relatively subjective, especially since there was no formal test or validation of the competencies. A third-party evaluation should be used in a future study and to validate the self-assessments. The study covered only tertiary hospitals in five provinces of northwestern China, limiting the generalizability of the conclusions. Future studies should be performed nationwide. Eventual nurse differences among regions, genders, and age groups could not be assessed. Confounding factors such as stress, work conflict, time management, and team work were not assessed. In addition, due to the study design drawback, we failed to calculate the sample size by power analysis before the study. Alternatively, we calculated the sample size according to the number of variables (10 times the variables), that is 140 participants would be required. In the present study, a total of 277 valid questionnaires were received; we believe the participants number is sufficient. Despite these limitations, the current study is indicative of professional self-effectiveness.

In conclusion, among emergency nurses from tertiary hospitals of northwest China, senior nurses and those satisfied with their job had higher CIRN scores compared with younger nurses and those unsatisfied with their job. Thus, there is a need for empowering the junior nurses by way of education and training programs, as well as letting them handle patient care independently in order to gain experience, reach their goals at the individual and team levels, getting career progression, thereby ensuring their job satisfaction.

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## DISCLOSURE

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this manuscript.

## AUTHOR CONTRIBUTIONS

X.X.L. contributed to the conception and design of this study; Z.M. and H.W. performed the statistical analysis and drafted the manuscript; W.N.H. contributed to the conception and design of this study and critically reviewed the manuscript and supervised the entire study process. All the authors read and approved the final manuscript.

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