

HOSTED BY



Contents lists available at ScienceDirect

International Journal of Nursing Sciences

journal homepage: <http://www.elsevier.com/journals/international-journal-of-nursing-sciences/2352-0132>

Original Article

Exploratory study on resilience and its influencing factors among hospital nurses in Guangzhou, China

Yaxin Ren ^a, Ying Zhou ^{b,*}, Shaojing Wang ^a, Taizhen Luo ^a, Meiling Huang ^c, Yingchun Zeng ^a^a Department of Gynecology and Obstetrics, The Third Affiliated Hospital of Guangzhou Medical University, China^b School of Nursing, Guangzhou Medical University, China^c Department of Nursing, The Third Affiliated Hospital of Guangzhou Medical University, China

ARTICLE INFO

Article history:

Received 20 October 2017

Accepted 30 November 2017

Available online 6 December 2017

Keywords:

Influence factors

Nurses

Resilience

ABSTRACT

Background: Currently, building resilience in nurses is recognized as an important factor that helps maintain their health and stay in their profession; thus, identifying which factors can help them build resilience is necessary.

Methods: A cross-sectional survey design was used, and 1356 nurses from 11 general hospitals in Guangzhou, China, were assessed using the Chinese version of the Conner–Davidson Resilience Scale, the General Self-Efficacy Scale, the Simplified Coping Style Questionnaire, and the Job Stress Scale of Chinese nurses. The demographic characteristics of participants were also gathered.

Results: The mean total score of nurses' resilience is 59.99 (SD 13.59), which was significantly lower ($P < 0.001$) than that of the general people in China. The regression analysis affirmed that the factors which influence the resilience of nurses include self-efficacy, coping style, job stress, and education level ($R^2 = 49.4\%$, $P < 0.001$).

Conclusion: Nurses had low resilience. They could not effectively cope with job challenges and recover from adversity. Strengthening self-efficacy, choosing active coping, decreasing job stress, and enhancing educational training can effectively improve their resilience.

© 2017 Chinese Nursing Association. Production and hosting by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

In China, nursing is a stressful profession [1]. The considerable work pressures may lead to various physical and mental health problems [2]. The health and well-being of nurses are vital to their safe practice. Resilience stands out as a crucial component of health and well-being, which has been recognized by many researchers [3] as a coping mechanism for the workforce [4].

1.1. Resilience and its influencing factors for nurses

Resilience is defined as “the process of adapting well in the face of adversity, trauma, tragedy, threats, or significant sources of stress – such as family and relationship problems, serious health problems, or workplace and financial stressors” [5]. Resilient individuals

tend to recover quickly from stress, which helps them cope with life challenges [4]. The well-being of nurses is important for their professional effectiveness, as resilience for their health and happiness [6]. Several studies have corroborated that resilience may minimize the likelihood of psychological disorders, such as anxiety, depression, and post-traumatic stress disorder (PTSD) [7], and may also decrease risk factors for coronary heart disease (CHD) [8]. The loss of resilience in nurses not only compromises their health but also leads to burnout or leaving intentions, which are major concerns in nursing management [9,10]. According to Matos et al., resilience is also an important variable that may influence the job satisfaction of nurses [11]. Currently, building resilience in nurses is recognized as an important factor to help them remain in their profession [12].

Presently, academic circles in China have begun researching the resilience of nurses that lacks systematic studies. Moreover, few other countries have conducted this type of research. Two Australian scholars, Cameron and Brownie, interviewed 9 Registered Nurses (RNs) and suggested that coping style be an important impact factor for resilience [13]. The result was confirmed in the

* Corresponding author. School of Nursing, Guangzhou Medical University, Guangzhou 510180, Guangdong Province, China.

E-mail address: zhouying0610@163.com (Y. Zhou).

Peer review under responsibility of Chinese Nursing Association.

study of Zander [14]. They considered that a positive attitude could improve resilience. Gillespie et al. investigated 735 nurses in Australia and argued that hope, self-efficacy, control, coping, and competence could be statistically significant in explaining resilience [15]. White et al. also validated that self-efficacy was an important influencing factor of resilience [16]. Cameron et al. and Dean E corroborated that job stress could weaken the resilience development [13,17]. A national survey of 744 intensive care unit (ICU) nurses in the US affirmed a correlation between social support and resilience [7]. An ongoing debate about the relationship between personal characteristics and resilience emerges [15,18]. Friberg et al. verified that gender and age had certain effects on the level of resilience and that old people had high resilience levels [19]. Moreover, education levels also had a positive impact on resilience [20]. However, others maintained that only years of work experience and not age or education predicted resilience [15].

1.2. Job stress of Chinese nurses

Chinese nurses likely experience tremendous job stresses and severe psychological burdens [21]. First, these stresses and burdens beset Chinese nurses because of China's huge population and severe nursing shortage [21]. China is home to one-fifth of the world's population; however, the number of nurses is fairly scarce. According to the National Health and Family Planning Commission of the People's Republic of China, the ratio of registered nurses (RNs) per thousand people was 2.54 in mainland China in 2016, which fell far below the standard ratios in the European Union (8.0) [22]. However, with the medical and health-care system reform, China has gradually implemented the patient-centered holistic nursing care model. Nurses should spend considerable energy in clinical settings and upgrade their knowledge and skills to be competent for nursing care. The heavy workload has become a tremendous pressure among nurses [1]. Second, the current social atmosphere further exacerbates the psychological pressures on Chinese nurses. The social status of nurses in China is relatively low compared with their Western counterparts; the Chinese public shows less respect and understanding toward nurses. In addition, the media has fabricated various scandals associated with physicians and nurses, which have led to the public's loss of faith in them. Subsequently, medical disputes and violent incidents have frequently occurred between health-care workers and patients in recent years. Thus, the need to improve the ability of Chinese nurses to cope with occupational pressures looms ahead. As an essential factor in the process of coping with stress, resilience has become increasingly important [9,23].

Given the cultural differences, dissimilarities may exist between the study findings regarding Western nurses and those regarding Chinese nurses. Moreover, most previous studies have lacked diversity on their sample investigations. Importantly, little is known about the resilience of Chinese nurses. Crowe and Carlyle affirmed that the mental health nursing research must concentrate on large-scale studies to develop its research culture [24]. Therefore, the present study sought to explore the resilience of Chinese nurses and its influencing factors using a large sample survey. We choose the common influencing factors of resilience in Western research (demographics, self-efficacy, coping, and stress) to verify the results in China.

2. Methods

2.1. Design

A cross-sectional research design was selected for this descriptive study.

2.2. Participants

The target population included clinical RNs who had been employed full time for at least 1 year at a hospital. A total of 1400 nurses were invited to participate through convenience sampling in 11 general hospitals (6 large-scale general hospitals and 5 special hospitals) in Guangzhou, China. During the investigation, 44 subjects were excluded, whereas 1356 subjects were kept to the end.

2.3. Measures

The questionnaire included personal data and a measurement scale for the variables used. All the scales were widely used in China and had been previously validated and had shown good psychometric properties.

2.3.1. Demographic sheet

A demographic sheet was used to collect the demographic information of nurses, including their gender, age, education level, work position, years of work experience, marital status, and night shifts means whether working at night nowadays.

2.3.2. Connor–Davidson Resilience Scale

The Connor–Davidson Resilience Scale (CD-RISC) was used to measure resilience, which is a 25-item scale using a 5-point Likert response scale, ranging from 0 (not true at all) to 4 (true nearly all the time) to assess the resilience in individuals with stress and adversity in community and clinical settings. The total scores range from 0 to 100, with high scores reflecting high resilience. Connor and Davidson reported a Cronbach's alpha of 0.89 for the scale [25]. To improve the readability of the scale in Chinese translations, back-translations were made by Yu and Zhang. The reliability coefficient of the Chinese version of the CD-RISC was 0.91. The validity of the scale was also acceptable, and the CD-RISC had a significant correlation with the self-esteem, life satisfaction, and personality trait variables of the Neuroticism Extraversion Openness Five-Factor Inventory (NEO-FFI) [26].

2.3.3. General Self-Efficacy Scale

The General Self-Efficacy Scale (GSES) developed by Schwarzer and Jerusalem was used to measure the level of self-efficacy. This unidimensional scale contains 10 items with a 4-point response scale, ranging from 1 (not true at all) to 4 (exactly true). High response scores affirm high self-efficacy [27]. The Chinese version of the GSES was translated by Zhang and Schwarzer. The internal consistency coefficient was 0.87, and the test–retest reliability coefficient was 0.83 [28]. In addition, the GSES showed good construct validity through factor analysis, which indicated that one factor could explain 47.09% of the variance.

2.3.4. Simplified Coping Style Questionnaire

Coping style was measured with the Simplified Coping Style Questionnaire (SCSQ). This scale was developed by Chinese researchers Jie and Zhang [29]. A total of 20 items with two subscales (active and passive coping) were included in the SCSQ. The active coping subscale included 12 items, and the passive coping subscale included 8 items. The SCSQ used a 4-point response scale, ranging from 0 (do not take) to 3 (often take). The scale was administered to a community sample of 846 and was found to have good internal reliability (Cronbach alpha coefficients of 0.90 for the total scale, 0.89 for the active subscale and 0.78 for the passive coping subscale). The result comprises scores for active and passive coping [29].

2.3.5. Job Stress Scale of Chinese nurses

Job stress was measured using the Job Stress Scale of Chinese nurses, which was developed by Li and Liu. The scale was revised by referencing the nurse work stress scales in the US and the UK and was adapted to reflect Chinese culture. Factor analysis identified 5 dimensions that characterized the concept of job stress (nursing profession and work, workload and time allocation, work environment and resources, patient care, and management and interpersonal relations). This scale comprised 35 items and was scored on a 4-point scale, ranging from 1 (mild stress) to 4 (great stress). High scores indicate high levels of job stress. On the basis of the testing of 239 nurses, Li and Liu corroborated that the internal consistency according to Cronbach's α is 0.98 [30].

2.4. Data collection

The data were collected from Jan to April 2015. In this paper, the survey questionnaire contained a cover letter, a demographic sheet, the Connor–Davidson Resilience Scale, the General Self-Efficacy Scale, the Simplified Coping Style Questionnaire, and the Job Stress Scale of Chinese nurses. The director of nursing at each hospital helped the researchers collect the questionnaires. The nurses were organized to fill in the questionnaires during meetings, training sessions, and other concentration times. The questionnaires were recycled and examined on the spot. If the questionnaire was found to have missing items, then the researchers asked the subjects again to complete all the items when feasible. Of the 1400 subjects, 1356 completed the questionnaire, yielding a response rate of 96.86%.

2.5. Data analysis

The data were analyzed using the Statistical Package for the Social Sciences (SPSS), version 16.0. Descriptive statistics were used to describe the demographic characteristics of the participants, their mean scores for resilience, and other psychometric variables. A one-sample t -test was used to compare the resilience of nurses and that of the Chinese public. Spearman correlation, Pearson correlation, and a hierarchical multiple regression analysis were used to explore the predictors of nurses' resilience. Two-tailed $P < 0.05$ was taken to be statistically significant.

2.6. Ethical approval

The ethical committee of Guangzhou Medical University and the 11 general hospitals granted their ethical approval of this survey. The questionnaire included an introductory letter that explains our objectives and demands. The respondents voluntarily participated, their identity was kept anonymous, and they can exit the study any time. The returned questionnaires were only used for this research.

3. Results

3.1. Demographics

Nearly all the participants (95.7%) were female, with most (62.3%) of them younger than 30 years old. Most had either an associate degree or a bachelor's degree (93.6%); nearly half (49.1%) were junior RNs and had been working at a hospital for 1–5 years; more than half (51.7%) were married, with most (80.5%) of them working night shifts (Table 1).

3.2. Resilience and other psychosocial variables in this study

The mean total score of the Chinese version of the CD-RISC for

1356 nurses is 59.99 (SD = 13.59)—significantly lower ($t = -14.656$, $P < 0.001$) than that of the general population in China, which is 65.4 (SD = 13.9) [31].

In addition, the total mean scores for self-efficacy, active coping, passive coping, and job stress were 23.75 (SD 5.24), 2.05 (SD 0.47), 1.20 (SD 0.56), and 2.36 (SD 0.62), respectively (Table 2).

3.3. Factors influencing of resilience among nurses in China

A multiple regression was used to analyze the factors influencing the resilience of nurses. Before the multiple regression analysis, univariate analyses were conducted to verify the differences of resilience among demographic variables, and the Pearson correlations were conducted to identify other resilience-related variables in this study.

Discrepancies are found on the resilience of nurses among gender, educational level, work position, and night shifts (Table 1). The resilience of nurses had a significant positive correlation with self-efficacy and active coping and a significant negative correlation with passive coping and job stress (Table 3).

Multiple regressions were then performed. Demographic factors (gender, educational level, work position, and night shifts), self-efficacy, coping style (active coping and passive coping), and job stress were as independent variables, and resilience was a dependent variable to structure the regression model.

By the stepwise regression analysis, self-efficacy, coping style (active coping, passive coping), job stress, and education level were inserted into the regression model. These variables were shown to influence resilience significantly ($P < 0.01$), and account for the 47.4% of the variance of resilience (Table 4).

4. Discussion

This study affirms that the level of resilience in nurses was low compared with that of the general population in China. These differences may be context-based. The nature and environment of nurses' work, social status, occupational risks, and other factors may result in the psychological stress of nurses being more severe than that of the public [32]. Given that the social attitude in China encourages the public to "respect doctors but despise nurses," discrimination against nurses continues to exist. Consequently, nurses lack sufficient self-esteem and self-confidence. Moreover, frequent medical disputes and incidents of medical violence threaten nurses. Thus, they may experience more psychological stress than the general population.

Similar to other studies [21], this study validates that nurses have low self-efficacy and high job stress. Low self-confidence and a poor sense of accomplishment may be important reasons why low self-efficacy exists among nurses. Zeng [1] corroborated that the key stressors for Chinese nurses include a reward–effort imbalance and negative conceptions of nursing in the Chinese community. In addition, the participants reported active rather than passive coping strategies in managing stress. This finding is consistent with the research findings of Cao et al. [33]. Currently, nursing managers increasingly focus on developing effective coping strategies for nurses in China, including the encouragement of nurses to "talk with other people," "seek advice from friends," and "learn from others to address adversity"; these strategies help nurses maintain effective coping mechanisms during difficulties.

The examination of discrepancies of resilience among different demographic characteristics has proved that female nurses with high education and work position levels and no night shifts have high resilience ($P < 0.001$). Conventional wisdom holds that women need more protection and care than men; thus, they need emotional support from other people to relieve their stress easily.

Table 1
Demographic characteristics of participants (*n* = 1356).

Variable	<i>n</i> (%)	Score of resilience (Mean ± SD)	<i>t</i> / <i>F</i>	<i>P</i>
Gender			−2.229	0.026
Male	58 (4.3)	56.10 ± 15.41		
Female	1298 (95.7)	60.16 ± 13.49		
Age (years)			0.840	0.541
≤25	472 (34.8)	60.28 ± 12.65		
26–30	373 (27.5)	60.06 ± 13.13		
31–35	239 (17.6)	58.71 ± 14.33		
36–40	135 (10.0)	58.50 ± 15.94		
41–45	93 (6.9)	60.57 ± 13.76		
46–50	24 (1.8)	64.46 ± 15.40		
>50	20 (1.5)	62.65 ± 14.37		
Education level			5.011	0.002
Diploma	76 (5.6)	57.88 ± 14.18		
Associate degree	632 (46.6)	58.82 ± 13.28		
Bachelor's degree	637 (47.0)	61.30 ± 13.71		
Master's degree and above	11 (0.8)	66.45 ± 13.49		
Work position			2.796	0.039
Junior nurse	666 (49.1)	59.67 ± 12.99		
Senior nurse	474 (35.0)	59.70 ± 14.44		
Nurse-in-charge	195 (14.4)	60.99 ± 13.24		
Associate chief nurse and above	21 (1.5)	67.67 ± 14.08		
Years of work experience			1.226	0.299
1–5	666 (49.1)	60.31 ± 12.69		
6–10	246 (18.1)	58.83 ± 14.22		
11–15	156 (11.5)	59.43 ± 14.06		
16–20	144 (10.6)	59.32 ± 15.45		
>20	144 (10.6)	61.78 ± 13.99		
Marital status			0.784	0.457
Single	641 (47.3)	60.48 ± 13.02		
Married	701 (51.7)	59.56 ± 14.04		
Divorced	14 (1.0)	59.07 ± 16.54		
Night shifts			−2.729	0.006
Yes	1092 (80.5)	59.50 ± 13.53		
No	264 (19.5)	62.03 ± 13.67		

Table 2
Descriptive statistics for all scales in this survey.

Scale	Theoretical range	Mean	SD
Connor–Davidson Resilience	0–100	59.99	13.59
General self-efficacy	10–40	23.75	5.24
Simplified coping style			
Active coping	0–36	24.58	5.58
Passive coping	0–24	9.56	2.46
Chinese nurse job stress	35–140	82.47	21.66

Table 3
Correlations between resilience and self-efficacy, coping style, and job stress.

Variables	1	2	3	4	5
1. Resilience	1	0.596*	0.532*	−0.122*	−0.142*
2. Self-efficacy		1	0.478*	0.031	−0.047
3. Active coping			1	0.134*	−0.085*
4. Passive coping				1	0.134*
5. Job stress					1

**P* < 0.01.

As male nurses are a minority in nurses in China, some of them feel low social recognition, which resulting in a heavy psychological burden [34]. Nurses with high education and high work position levels understandably have rich theoretical knowledge and clinical experiences and can manage stress in clinical environments [35]. In addition, night shifts may result in various mental and physical health problems because the circadian rhythms are disturbed and family and social life are disrupted [36]. Many studies have confirmed that resilience is related to mental health [37].

Table 4
Multiple regressions of independent variables on resilience.

Variable	β	Std. error	Std β	<i>t</i>	<i>P</i>
Constant	18.488	2.084		8.870	<0.001
Self-efficacy	1.124	0.058	0.433	19.269	<0.001
Coping style					
Active coping	0.822	0.056	0.338	14.814	<0.001
Passive coping	−0.519	0.061	−0.170	−8.444	<0.001
Job stress	−0.044	0.013	−0.070	−3.506	<0.001
Education level	1.310	0.440	0.059	2.980	0.003
(0 = Diploma, 1 = Associate degree, 2 = Bachelor's degree, 3 = Master's degree and above)					

Note: β = regression coefficient; Std β = standardized regression coefficient; $R^2 = 0.474$, Adjust $R^2 = 0.472$, $F = 243.701$, $P < 0.001$.

The multiple regression analysis has revealed that self-efficacy, coping style, job stress, and education level significantly influenced the resilience of nurses. Specifically, our study affirms a positive correlation between resilience and self-efficacy, which is consistent with other studies among nurses [15]. This scenario verifies that resilience can be improved by increasing the self-efficacy of a person, which can help one cope with changes and enhance their problem-solving skills [23]. Self-efficacy may assist nurses in coping with the different types of clinical matters; thus, resilience can be developed through such capabilities. Coping style is a moderately significant predictor of resilience. Active coping has a positive impact on resilience, whereas passive coping has a negative impact on resilience. The influence of coping style on

resilience may be explained by the “learned helplessness theory of Seligman” [38]. This theory indicates that, when individuals act in a passive way, their self-esteem and sense of control will decrease, and they may feel powerless to change, external events, or experience confusion, showing a sense of disappointment and ultimately having difficulty to recover from adversity. Conversely, an active response can increase individuals' self-confidence and sense of accomplishment, thereby increasing their ability to overcome threats. Job stress is also an important factor to explain resilience. High levels of job stress perceived will lessen the resilience levels of nurses. This finding is consistent with previous studies [14,39]. Nurses must master the ability to manage their stress and should focus on personal and environmental stressors [40]. Therefore, increasing the personal training to manage stress and social support can help develop the resilience of nurses. Finally, the study confirms that education level is the only predictor of resilience in terms of demographic characteristics. People with high education levels show high levels of self-awareness, planning, and control and demonstrate strong ability using their social resources and skills, which can help handle stress well. However, Gillespie et al. elucidated that only years of experience predicted resilience among theater nurses in Australia [15]. This difference may result from cultural differences or the subjects of the study. The proportion explaining the relationship between resilience and education level is fairly small.

5. Limitations

This study has only investigated nurses in Guangzhou, China. The sample may not reflect all Chinese nurses. Future research must expand the scope of sampling and examine other probable factors influencing the resilience of nurses, such as social support and personality. Although this study has employed a quantitative survey, further research must combine quantitative data with qualitative data to obtain additional reliable and valuable results.

6. Conclusion

Nurses and administrators should focus on building resilience and take a series of interventions to develop it. By understanding the factors influencing the resilience of nurses, this study provides a clear direction to identify strategies that can promote resilient behaviors to nurses, such as increasing self-efficacy, choosing positive coping mechanisms, relieving job stress, and gaining additional professional knowledge. Participating in various health education and counseling will also be wise. This study opens the door for the development of interventions that may be applicable among nurses.

Conflicts of interest

No conflict of interest has been declared by the author(s).

Contributions

Ren YX contributed to the conception, design, data collection, data analysis, and drafting of this manuscript; Zhou Y made critical revisions for the design and manuscript; Wang SJ, Luo TZ, and Huang ML conducted the data collection and supervision; and Zeng YC assisted in data analysis.

Funding

This paper was not funded by any institution or organization.

Acknowledgments

We express our thanks to the directors of nursing departments from the 11 hospitals in our research for their help and advice on the data collection and to all the nurses who participated in the study.

Appendix A. Supplementary data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.ijnss.2017.11.001>.

References

- [1] Zeng Y. Review of work-related stress in mainland Chinese nurses. *Nurs Health Sci* 2009;11(1):90–7.
- [2] Han K, Trinkoff AM, Storr CL, Geiger-Brown J. Job stress and work schedules in relation to nurse obesity. *J Nurs Adm* 2011;41(11):488–95.
- [3] Drybye L, Shanafelt T. Nurturing resiliency in medical trainees. *Med Educ* 2012;46(4):343.
- [4] McAllister M, McKinnon J. The importance of teaching and learning resilience in the health disciplines: a critical review of the literature. *Nurse Educ Today* 2009;29(4):371–9.
- [5] American Psychology Association. The road to resilience: what is resilience?. Available at, <http://www.apa.org/helpcenter/road-resilience.aspx>. [Accessed 16 May 2017].
- [6] Eley DS, Cloninger CR, Walters L, Laurence C, Synnott R, Wilkinson D. The relationship between resilience and personality traits in doctors: implications for enhancing well being. *PeerJ* 2013;1:216.
- [7] Mealer M, Jones J, Moss M. A qualitative study of resilience and posttraumatic stress disorder in United States ICU nurses. *Intensive Care Med* 2012;38(9):1445–51.
- [8] Burton NW, Pakenham KI, Brown WJ. Evaluating the effectiveness of psychosocial resilience training for heart health, and the added value of promoting physical activity: a cluster randomized trial of the READY program. *BMC Public Health* 2009;9:427.
- [9] Gillespie BM, Chaboyer W, Wallis M. The influence of personal characteristics on the resilience of operating room nurses: a predictor study. *Int J Nurs Stud* 2009;46(7):968–76.
- [10] Ecklebeery-Hunt J, Lick D, Boura J, Hunt R, Balasubramaniam M, Mulhem E, et al. An exploratory study of resident burnout and wellness. *Acad Med* 2009;84(2):269–77.
- [11] Matos PS, Neushotz LA, Griffin MT, Fitzpatrick JJ. An exploratory study of resilience and job satisfaction among psychiatric nurses working in inpatient units. *Int J Ment Health Nurs* 2010;19(5):307–12.
- [12] Gray J. Building resilience in the nursing workforce. *Nurs Stand* 2012;26(32):1.
- [13] Cameron F, Brownie S. Enhancing resilience in registered aged care nurses. *Australas J Ageing* 2010;29(2):66–71.
- [14] Zander M, Hutton A, King L. Coping and resilience factors in pediatric oncology nurses. *J Pediatr Oncol Nurs* 2010;27(2):94–108.
- [15] Gillespie BM, Chaboyer W, Wallis M, Grimbeek P. Resilience in the operating room: developing and testing of a resilience model. *J Adv Nurs* 2007;59(4):427–38.
- [16] White B, Driver S, Warren AM. Resilience and indicators of adjustment during rehabilitation from a spinal cord injury. *Rehabil Psychol* 2010;55(1):23–32.
- [17] Dean E. Building resilience. *Nurs Stand* 2012;26(32):16–8.
- [18] Gooding PA, Hurst A, Johnson J, Tarrier N. Psychological resilience in young and older adults. *Int J Geriatr Psychiatry* 2012;27(3):262–70.
- [19] Friberg O, Hjemdal O, Rosenvinge JH, Martinussen M. A new rating scale for adult resilience: what are the central protective resources behind healthy adjustment? *Int J Methods Psychiatr Res* 2003;12(2):65–76.
- [20] Campbell-Sills L, Forde D, Stein MB. Demographic and childhood environmental predictors of resilience in a community sample. *J Psychiatr Res* 2009;43(12):1007–12.
- [21] Wu S, Zhu W, Wang Z, Wang M, Lan Y. Relationship between burnout and occupational stress among nurses in China. *J Adv Nurs* 2007;59(3):233–9.
- [22] News Eastday. The number of registered nurses reached 350 ten thousand in China. Available, <http://news.eastday.com/eastday/13news/auto/news/china/20170510/u7ai6762147.html>. [Accessed 20 October 2017].
- [23] Tusaie K, Dyer J. Resilience: a historical review of the construct. *Holist Nurs Pract* 2004;18(1):3–8.
- [24] Crowe M, Carlyle D. Mental health nursing research: the contemporary context. *Int J Ment Health Nurs* 2007;16(5):365–70.
- [25] Connor KM, Davidson JR. Development of a new resilience scale: the Connor-Davidson Resilience Scale (CD-RISC). *Depress Anxiety* 2003;18(2):76–82.
- [26] Yu X, Zhang J. Factor Analysis and Psychometric evaluation of the Connor-Davidson Resilience Scale (CD-RISC) with Chinese people. *Soc Behav Pers* 2007;35(3):19–30.
- [27] Schwarzer R, Jerusalem M. Measures in health psychology: a User's portfolio.

- Windsor: Nfer-Nelson; 1995.
- [28] Zhang J, Schwarzer R. Measuring optimistic self-beliefs: a Chinese adaptation of the general self-efficacy scale. *Psychologia* 1995;38(2):174–81.
- [29] Jie Y, Zhang Y. Common psychological assessment scale manual. Beijing: People's Medical Publishing; 1998 [in Chinese].
- [30] Li X, Liu Y. Job stressors and burnout among staff nurses. *Chin J Nurs* 2000;35(11):645–9 [in Chinese].
- [31] Yu XN, Lau JT, Mak WW, Zhang J, Lui WW, Zhang J. Factor structure and psychometric properties of the Connor-Davidson Resilience Scale among Chinese adolescents. *Compr Psychiatry* 2011;52(2):218–24.
- [32] Purcell SR, Kutash M, Cobb S. The relationship between nurses' stress and nurse staffing factors in a hospital setting. *J Nurs Manag* 2011;19(6):714–20.
- [33] Cao X, Guo Y, Liu X. Investigation of coping style to stress among nurses. *Chin J Adv Nurs* 2009;23(5):815–6 [in Chinese].
- [34] Shi D, Zhao J. Investigation and analysis on current situation of nurses' job stress and measures. *Chin J Pract Nurs* 2011;27(34):4–7 [in Chinese].
- [35] Xianyu Y, Lambert VA. Investigation of the relationship among workplace stressors, ways of coping, and the mental health of Chinese head nurses. *Nurs Health Sci* 2006;8(3):147–55.
- [36] Coffey LC, Skipper Jr JK, Jung FD. Nurses and shift work: effect on job performance and job related stress. *J Adv Nurs* 1998;13(2):245–54.
- [37] Lee JE, Sudom KA, Zamorski MA. Longitudinal analysis of psychological resilience and mental health in Canadian military personnel returning from overseas deployment. *J Occup Health Psychol* 2013;18(3):327–37.
- [38] Seligman ME, Weiss J, Weinraub W, Schulman A. Coping behavior: learned helplessness, physiological change and learned inactivity. *Behav Res Ther* 1980;18(5):459–512.
- [39] Mealer M, Jones J, Newman J, McFann KK, Rothbaum B, Moss M. The presence of resilience is associated with a healthier psychological profile in intensive care unit (ICU) nurses: results of a national survey. *Int J Nurs Stud* 2012;49(3):292–9.
- [40] Lazarus A. Managed competition and access to emergency psychiatric care. *Hosp Community Psychiatry* 1993;44(12):1134–6.