Archives of Psychiatric Nursing 33 (2019) 434–439

Contents lists available at ScienceDirect

Archives of Psychiatric Nursing

journal homepage: www.elsevier.com/locate/apnu

Validation of the resilience scale for nurses (RSN)

Sunghee Park[a], Miyoung Choi[b,*], Sunhwa Kim[c]

[a] Department of Nursing, Kunsan National University, #406, Digital Information Center, 558, Daehak-ro, Gunsan-si, Jeonllabuk-do 54150, Republic of Korea
[b] Department of Nursing Science, Chungbuk National University, Chungdae-ro 1, Seowon-Gu, Cheongju, Chungbuk 28644, Republic of Korea
[c] Department of Nursing, Kunsan Medical Center, 29-1, Jigok-dong, Jeollabuk-do 54105, Republic of Korea

ARTICLE INFO

Keywords:
Resilience
Nurse
Validation
Factor analysis
Statistical

ABSTRACT

Aim: The purpose of this study was to verify the validity and reliability of the resilience scale for nurses (RSN).
Methods: 27 preliminary items were extracted from previous research. The subjects were 339 nurses who worked at 2 hospitals in South Korea in 2016. Collected data were analyzed using explanatory factor analysis (EFA). EFA was performed with principal axis factoring with oblimin rotation and confirmatory factor analysis (CFA) with SPSS 25.0 and AMOS 25.0 version program. Also, data were examined by construct, discriminant, and convergent validity, and internal consistency reliability.
Results: Resilience scale for nurses showed CFA supported the four-factor structure (Philosophical pattern, Relational pattern, Dispositional pattern, and Situational pattern) of the measure. The 19 items for 4 factors identified that explained 67.329% of the total variance in RSN. A total the internal consistency reliability (Cronbach's $\alpha = 0.938$) was stable.
Conclusion: Psychometric properties of RSN show that it is a useful and reliable scale to assess Resilience in Korean nurses. Based on these results, effective resilience intervention programs for nurses can be developed.

Introduction

Nurses account for approximately 50% of the total workforce in medical institutions, and they primarily interact with patients. Therefore, they greatly affect the quality of medical services and patient satisfaction (Oh & Chung, 2011). To improve the quality of medical services and patient satisfaction, it is important to employ and maintain a high-quality nursing workforce. The turnover rate of nurses, however, is alarming (17%), and there are difficulties in securing capable and skilled nurses, which in turn lead to the decline in the quality of medical service and patient satisfaction (Choi & Kim, 2015; Hospital Nurses Association, 2015). In this regard, countermeasures are urgently required.

Clinical nurses are exposed to excessive work-related stress including immoderate workload, limited time, and conflict in the interpersonal relationship regarding job-related characteristics. Eventually, they experience burnout (Kang & Lim, 2015; Kim & Yoo, 2014; Yeun, 2014). Burnout negatively affects nurses' job satisfaction, and results in a decline in job engagement, which is a hindrance to nursing organizational culture, and causes an increase in turnover intention (Choi & Kim, 2015; Garrett, 2008; Moon, Park, & Jung, 2013).

Some nurses experience burnout due to various difficulties and stress faced at the workplace and are compelled to change jobs. However, some nurses can sustain by overcoming difficulties. The nurses' resilience began to gain importance, as attention was drawn to the factors accounting for this difference (Gillespie, Chaboyer, Wallis, & Grimbeek, 2007; Polk, 1997).

Resilience is a personal holistic inner ability to cope with a stressful environment (Hart, Brannan, & De Chesnay, 2014; Rutter, 2008; Zautra, Hall, & Murray, 2010), and it is reported that resilience has statistically significant negative correlations with job-related factors such as clinical nurses' job stress, burnout, and turnover intention, beyond the inner control (Choi & Kim, 2015; Kim, Oh, & Park, 2011). Nurses' resilience promotion is thought to have a positive effect on nursing job quality improvement.

Resilience is a capability required of nurses to positively overcome numerous difficulties in clinical settings, to exhibit professional competencies, and help patients maintain optimum physical condition (Park & Park, 2016; Polk, 1997). As the continuous control and improvement of nurses' resilience positively affect patients, as well as the nurses themselves (Williams et al., 2016), it is essential for nursing practice. Clinical nurses' resilience is a concept that only started to gain attention recently; thus, studies to verify the validity and reliability of the resilience scale to develop an intervention program to promote resilience are needed.

After reviewing previous studies on clinical nurses' resilience, most

* Corresponding author.
E-mail addresses: shpark@kunsan.ac.kr (S. Park), myb98@chungbuk.ac.kr (M. Choi).

https://doi.org/10.1016/j.apnu.2018.12.004
Received 13 April 2018; Received in revised form 18 November 2018; Accepted 31 December 2018
0883-9417/ Published by Elsevier Inc.

studies examined simple correlations between resilience and various variables: resilience and job satisfaction (Hudgins, 2016; Kim et al., 2011), resilience and burnout (Kang & Lim, 2015; Kim et al., 2011; Kim & Yoo, 2014; Ryu & Kim, 2016), resilience and turnover intention (Choi & Kim, 2015; Hudgins, 2016). However, there were insufficient studies to confirm the validity and reliability of the resilience scale for nurses. Of the variables identified as having correlations with resilience, particularly burnout (Kang & Lim, 2015; Kim, Park, & Kwon, 2015; Moon et al., 2013), and turnover intention (Choi & Kim, 2015; Hudgins, 2016) are often used in correlational studies. They are also the variables found to have high correlations with nurses' resilience. This study was carried out to identify baseline data for the development of an intervention program to promote clinical nurses' resilience by identifying job-related factors affecting their resilience. Since a scale for measuring resilience was developed for Korean clinical nurses (Park & Park, 2016), it is necessary to continuously test the reliability and validity of the scale. Therefore, the purpose of this study was to verify the validity and reliability of resilience scale and identify associating factors of resilience in Korean clinical nurses.

Methods

Scale development process

We validated in two phases the Resilience Scale in Nurses (RSN). In phase one, based on Polk's work (Polk, 1997), we presented our theoretical framework (Fig. 1). Polk (1997) presented a Nursing Model of Resilience-based on the Rogers Theory, through the concept of the energy field, openness, pattern, and dimensionality. In addition, Polk (1997) classified the characteristics of overcoming power into four patterns through the concept synthesis process. This model portrays four patterns of resilience (Dispositional pattern, Relational pattern, Situational pattern, and Philosophical pattern).

In phase two, we tested RSN based on previous work (Kim, & Park, 2016; Park & Park, 2016). Park and Park (2016) developed a nurse-reported instrument using concept analysis based on a review about previous resilience scale, literature review, and interviews with nurses. And then, a total of 27 items in 5 factors (philosophical, professional, relational, dispositional, and situational pattern) validated for Korean nurses by Kim and Park (2016). The preliminary RNS was administered to 348 nurses in two hospitals.

Fig. 1. The theoretical framework of resilience in nurses.

Table 1
Characteristics of participants (N = 339).

Characteristics	Categories	n (%)	M ± SD	Range
Age (year)	20–29	172 (50.7)	31.94 ± 8.41	21–55
	30–39	102 (30.1)		
	40–49	49 (14.5)		
	≥50	16 (4.7)		
Marital status	Married	145 (42.8)		
	Not married	194 (57.2)		
Education status	Diploma	124 (36.6)		
	Bachelor	193 (56.9)		
	≥Master	22 (6.5)		
Religion	Christian	119 (35.1)		
	Catholic	29 (8.6)		
	Buddhism	16 (4.7)		
	etc.	175 (51.6)		
Year of total career	< 1	35 (10.3)	8.54 ± 8.42	0.05–33.01
	1–4	119 (35.1)		
	5–9	68 (20.1)		
	≥10	117 (34.5)		
Year of current work unit	< 1	98 (28.9)	2.85 ± 4.23	0.01–30.0
	1–4	180 (53.1)		
	5–9	45 (13.3)		
	≥10	16 (4.7)		
Type of duty	Fixed day duty	95 (28.0)		
	Rotating shift duty	244 (72.0)		
Current work unit	Inpatient unit	201 (59.3)		
	Special unit	116 (34.2)		
	Outpatient unit	22 (6.5)		
Job position	Staff nurse	306 (90.3)		
	Charge nurse	11 (3.2)		
	Head nurse	22 (6.5)		
Placement of the desired work unit	Yes	195 (57.5)		
	No	144 (42.5)		
Type of hospital	University hospital	118 (34.8)		
	General hospital	221 (65.2)		

Participants and procedure

This study conducted on nurses agreed to participate in the study at tertiary hospitals in South Korea. The data were collected between March and May 2016. Nurses with < 6 months of work experience in a hospital were excluded from the study. Of initial 348 nurses, 339 were used in the final analysis. The questionnaire took approximately 20 min to complete; the participants received gifts (hand cream) as a token of appreciation after completing the questionnaire.

Measures

The characteristics of the subjects were selected based on the previous research by the first author.

Nurses' resilience was assessed using the resilience scale for nurses devised by Park and Park (2016) and then factor structure validated identified for in Korean nurses by Kim and Park (2016). The scale comprises 27 items grouped under 5 subscales: dispositional pattern (4 items), relational pattern (5 items), situational pattern (4 items), philosophical pattern (7 items), and professional pattern (7 items). Each item was scored using a five-point Likert scale ranging from 1 (almost never) to 5 (almost always), with higher scores indicating a greater degree of resilience. Cronbach's α for the scale was 0.95 at the time of development, 0.95 when verified by Kim and Park (2016).

Table 2
Factor pattern matrix.

Variables		Factor			
		Philosophical pattern	Relational pattern	Situational pattern	Dispositional pattern
19	I feel generally happy	0.895	−0.005	−0.069	0.032
20	I am satisfied with my life	0.876	−0.091	0.037	0.017
21	I am an important person	0.851	0.074	0.007	−0.070
18	I have hope for the future	0.753	0.056	0.025	0.076
22	I have a strong goal consciousness for life	0.716	−0.006	0.067	0.143
23	I am a necessary person to someone else	0.672	0.175	0.044	0.067
5	I lead the conversation while considering the position of the other person	−0.048	0.791	−0.048	0.127
7	I fully accept the advice of others	0.018	0.774	0.124	−0.088
6	I keep a good relationship with people around me	0.045	0.738	0.018	0.122
8	There are people around me, to help when I have a difficult task	0.229	0.612	0.086	−0.059
12	I know when I am not involved in the work or I am involved	0.087	0.035	0.865	−0.076
11	I have the ability to determine the priority order during execution of the job	−0.076	−0.019	0.822	0.192
10	I have the ability to determine the work that I can do or cannot do	0.065	0.149	0.736	−0.001
2	I am a strong person and can cope with life's challenges and adversity	0.101	−0.020	−0.087	0.762
16	I can do a new job or a difficult work	0.043	−0.033	0.113	0.753
1	I do not give up under any circumstances	−0.075	0.213	−0.069	0.711
25	I am working autonomously	0.015	−0.062	0.263	0.637
26	Once I start doing something, I can achieve the expected goal	0.146	0.014	0.084	0.625
15	I have the ability to cope with stressful work situations	0.175	0.046	0.049	0.570
	Eigen value	9.301	1.394	1.295	1.073
	Explained variance (%)	47.529	7.336	6.817	5.647
	Total explained variances (%)	47.529	54.865	61.682	67.329

Ethical considerations

This study was approved by the researcher's Institutional Review Board (approval no: 1040117-201601-HR-002-01) before the study began. We explained the following to the participants: the purpose, progress, and process of the study; that the questionnaire survey results would not be used for other purposes other than the study purpose; that all questionnaire data would be processed with anonymity, and that they could withdraw from the study at any time, if they did not want to participate in the study. After that, we obtained signed informed consent forms prior to administering the questionnaire.

Data analysis

The collected data were analyzed using SPSS 25.0 and AMOS 25.0 version (IBM Corp., Armonk, NY, USA). Characteristics of the participants were analyzed with descriptive statistics including frequency (%), means, and standard deviations. Item analysis was analyzed by descriptive statistics and Pearson's correlation coefficients.

Construct validity was verified by exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). The Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity (BTS) were identified to determine if the collected data were suitable for factor analysis. EFA used Principal Axis factoring with oblimin rotation about the preliminary 27 items. Convergent validity was examined construct reliability (C.R.) and Average Variance Extracted (AVE). Discriminant validity was examined by verifying whether all AVE value is larger than the square of the correlation coefficient between the latent variables (Yu, 2012). The internal consistency reliability was identified by Cronbach's alpha. Characteristics of the participants were analyzed with descriptive statistics. Pearson's correlation coefficient was used to determine the correlations among the main variables.

Results

Characteristics of participants

Characteristics of the participants are presented in Table 1. All participants were females, the mean age was 31.94 ± 8.41 years. One hundred and eighty-five nurses (54.6%) of participants were worked > 5 years. In terms of hospital type, 221 nurses (65.2%) worked at the general hospital, and 118 nurses (34.8%) worked at the university hospital.

Verification of the construct validity

EFA was performed to investigate the structure of the RNS. The mean and standard deviation of the items and the correlation between the items and the total items were analyzed to remove the items that disturbed the discrimination and reliability among the 27 items of the selected preliminary tools.

The KMO and BTS for RSN were 0.936 and $\chi^2 = 3838.312$ ($p < .001$). Because the KMO measure is > 0.90, the collected data were considered excellent compatibility (Yu, 2012). In order to select

Table 3
The result of confirmatory factor analysis.

Factors	Item	Standardized estimate (β)	SE	C.R.	Factors				AVE	CR
					1 (*r*)	2 (*r*)	3 (*r*)	4 (*r*)		
1. Philosophical pattern	18	0.82	0.06	17.09	1				0.78	0.96
	19	0.83	0.06	17.51						
	20	0.81	–	–						
	21	0.81	0.06	16.96						
	22	0.82	0.06	17.29						
	23	0.82	0.05	17.08						
2. Relational pattern	5	0.68	0.09	11.03	0.61**	1			0.74	0.92
	6	0.78	0.09	12.36						
	7	0.70	–	–						
	8	0.71	0.09	11.45						
3. Situational pattern	12	0.79	0.06	14.96	0.57**	0.54**	1		0.81	0.93
	13	0.79	0.06	14.99						
	14	0.82	–	–						
4. Dispositional pattern	1	0.63	0.10	10.36	0.70**	0.55**	0.58**	1	0.66	0.92
	2	0.67	0.10	11.00						
	15	0.71	0.10	11.63						
	16	0.77	0.09	12.41						
	25	0.71	0.10	11.57						
	26	0.73	0.09	11.89						

Fitness index	χ^2 (p)	df	CMIN/DF	GFI	IFI	RMSEA (90% CI)	TLI	CFI
Criteria	(> 0.05)	146	≤3.0	≥0.90	≥0.90	0.05–0.08	≥0.90	≥0.90
Model	408.217 (< 0.001)		2.80	0.90	0.93	0.073	0.92	0.93

SE = standard error; C.R. = critical ratio; AVE = Average Variance Extracted; CR = construct reliability; CMIN/DF = Chi-square minimum/degree of freedom; GFI = Goodness of Fit Index; IFI = Incremental Fit Index; RMSEA = Root Mean Square Error of Approximation; TLI = Tucker-Lewis Index; CFI = Comparative Fit Index.

** $p < 0.01$

the items that can represent the meaning of each factor, a question with a community of 0.40 or higher and a factor loading of 0.40 or higher was selected, and the eigen value of the factor was > 1.0. As a result of the EFA, 19 items for 4-factors extracted. The factor loadings of the pattern matrix were 0.45 or more, and the commonality of the items was 0.54 or more. The extracted four factors accounted for 67.329% of the total variance. Factor 1 was named “philosophical pattern”, factor 2 was named “relational pattern”, factor 3 was named “dispositional pattern”, factor 4 was named “situational pattern” according to the contents and characteristics of the RNS 〈Table 2〉.

CFA was performed to examine the structural relationships among four subfactors derived from exploratory factor analysis. In the confirmatory factor analysis, the fit index was calculated using the χ^2 statistic (p-value), standard χ^2 (Chi-square minimum/degree of freedom [CMIN/DF]), Goodness of Fit Index [GFI] Standardized Root Mean Residual (SRMR), Root Mean Square Error of Approximation (RMSEA) The Tucker Lewis Index [TLI] and the Comparative Fit Index [CFI]. In order to evaluate the construct validity of the instrument, the convergent validity and discriminant validity of the item were verified. The convergent validity was evaluated by standardized factor loading, critical ratio [C.R.] value, Average Variance Extracted [AVE], and construct reliability [CR]. The discriminant validity was evaluated by the difference between the square of the correlation coefficient and the AVE value (Yu, 2012). CFA showed acceptable construct validity. Model fit index of GFI (Goodness of Fit Index), NFI (Normal Fit Index), CFI (Comparative Fit Index), IFI (Incremental Fit Index), and TLI (Tucker Lewis Index) were 0.90 or more, respectively. RMSEA (Root Mean Square Error of Approximation), which indicates the overall model of fitness, was also 0.073 (Table 3, Fig. 2).

Verification of the convergent and discriminant validity

Convergent validity was measured by AVE (Average Variance Extracted) value and construct reliability (CR). It was confirmed if the AVE value was > 0.50 and construct reliability was > 0.70. The convergent validity of this study was verified because the AVE value was 0.66–0.81, and the CR was 0.92–0.96 (Table 3).

Discriminant validity was examined by verifying whether the AVE value is larger than the square of the correlation coefficient between the latent variables (Yu, 2012). All AVE values were larger than the square of the correlation coefficient, and the discriminant validity was verified (Table 3).

Final scale

Cronbach's alpha estimate of the total 19 items was 0.938 and subscales was 0.922 for the philosophical pattern, 0.808 for the relational pattern, 0.839 for the situational pattern and 0.845 for the dispositional pattern. The internal reliability of the resilience scale was acceptable 〈Table 4〉.

Discussion

This study was attempted to assess the validity and reliability of the resilience scale for nurses (RNS). Because the existing Korean studies measured clinical nurses' resilience using a scale developed for the general public that was developed abroad, they were limited in that Korean social and cultural attributes were not adequately considered. This study, however, is meaningful in that it measured nurses' resilience using a scale developed using in-depth interview results targeting clinical nurses.

Factor analysis for tool validation when a tool is developed based on theory and factor structure is confirmed, it is appropriate to perform confirmatory factor analysis (Fitzpatrick, 2017). The resilience in nurses' scale was originally developed Park and Park (2016) and based on the model of Kim and Park (2016). The RNS conducted EFA in a

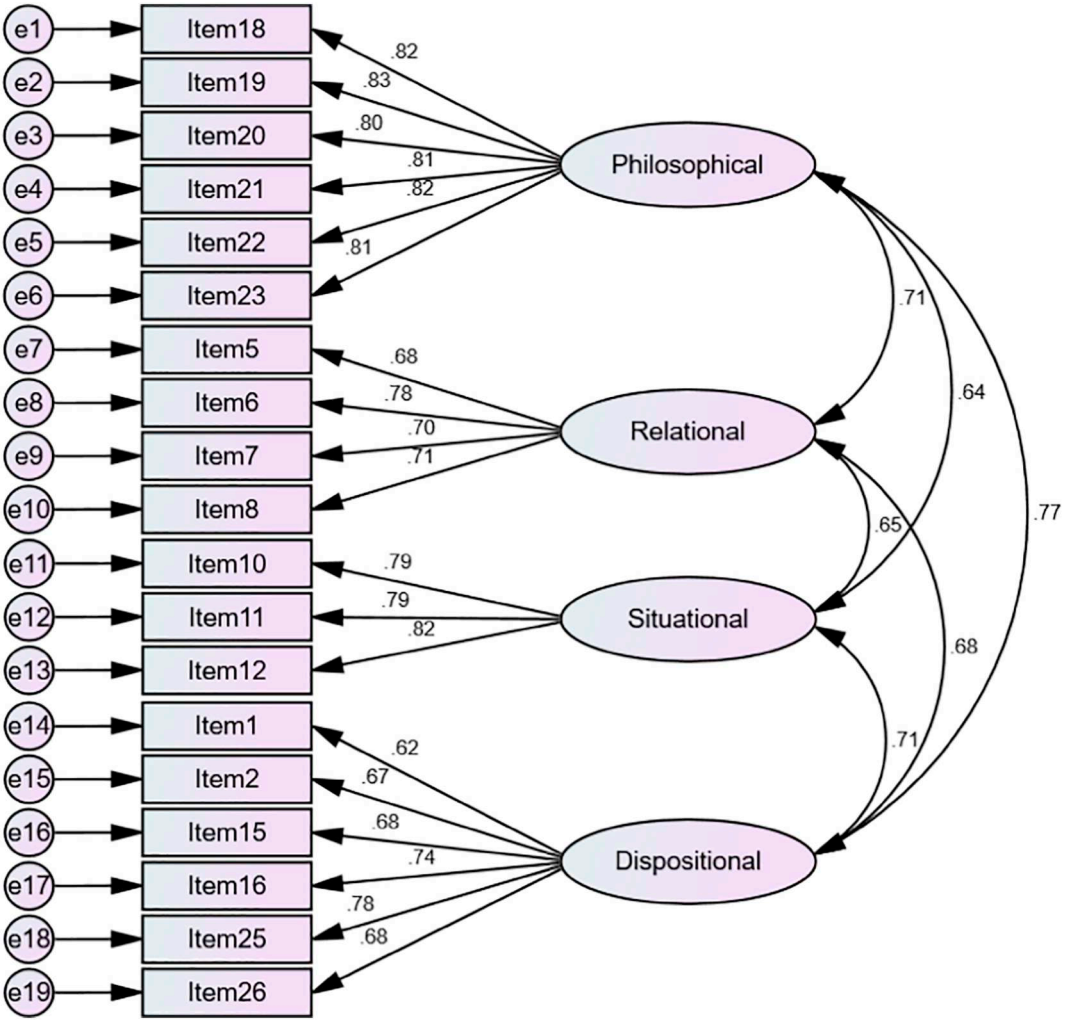

Fig. 2. The measurement model for resilience scale for nurses (RNS).

Table 4
Internal reliability.

Factors	Item	Item-total correlation	Alpha if item deleted	Cronbach's alpha
Philosophical pattern	18	0.743	0.932	0.922
	19	0.721	0.933	
	20	0.703	0.933	
	21	0.705	0.933	
	22	0.754	0.932	
	23	0.762	0.932	
Relational pattern	5	0.536	0.936	0.808
	6	0.630	0.935	
	7	0.536	0.936	
	8	0.595	0.935	
Situational pattern	10	0.637	0.934	0.839
	11	0.603	0.935	
	12	0.600	0.935	
Dispositional pattern	1	0.562	0.936	0.845
	2	0.578	0.936	
	15	0.634	0.935	
	16	0.641	0.934	
	25	0.652	0.934	
	26	0.607	0.935	
Total				0.938

study by Kim and Park (2016). However, both EFA and CFA were performed to reaffirm that the factor structure is appropriate for measuring nurses' resilience. We extracted four factors from the items and defined them according to Polk (1997)'s model. As a result of conducting the EFA on the basis of the preliminary 27 items, finally, it was confirmed as four sub-factors and confirmed as a philosophical pattern, relational pattern, dispositional pattern and situational pattern. As a result of CFA, a total of four factors and 19 items were derived. CFA results supported satisfactory as evidence four factors of RNS. In particular, RMSEA, a fit index developed to develop the problem of the χ^2 statistic, was shown as 0.07, which proved to be a fairly good model. Convergent and discriminant validity was supported satisfactory score. Also, internal consistency was acceptable. But, the correlation between the factor 1 philosophical pattern, the factor 2 relational pattern and the factor 4 dispositional pattern was high and the correlation between the factor 3 situational pattern and the factor 4 dispositional pattern was high. Repeated studies are needed to distinguish attributes of similar factors. In order to prove the validity of the RNS developed in this study, convergence and discriminant validity verification should be performed through repeated research. And the evidence on psychometric properties of different scales and settings is limited. Further researches that used this scale in more diverse samples are should be tested.

As a result, the first factor among the four sub-factors derived from this study was named as a philosophical pattern. In Kim and Park (2016)'s scale, all of the items belonging to the philosophical pattern were included in the tool, and they were also named as philosophical patterns in this study. However, item 29, which was included in the philosophical pattern in the existing tool, was deleted in this study (I

have the confidence to manage my life and my own living). The philosophical pattern (6 items) assesses personal belief and positive vision for the future.

The second factor was named a relational pattern, and the item 19 (I can communicate with other people who have different thoughts), which was included in Kim and Park's tools, was removed. The relational pattern (4 items) measures the value level of friendly and reliable relationship.

The third factor was named as a dispositional pattern and the two items included in the dispositional pattern and the five items included in the professional pattern in the existing tool were combined to measure the self-confidence, self-efficacy, and self-confidence that could solve the problem for the nurse himself. This result is consistent with the model proposed by Polk (1997)'s model, and is different from the results of Park and Park (2016), Kim and Park (2016). These results suggest that the autonomy of nurses' work, their efforts to acquire expert knowledge, and the important nursing competency related to job performance are self - understanding and perceived.

Finally, the fourth factor was named as a situational pattern and the same three items were included in the existing tool except for the 11th item (my past experience will help navigate the new challenges and adversity). The situational pattern (3 items) measures the ability to interpret stress situations, the flexibility in coping with it, and patience.

Some nurses are expected to have high role expectations for their work, experience exhaustion due to difficulties in their work environment, and be at risk of having stress-related illnesses. To provide high-quality nursing care to patients, nurses should retain resilience and develop coping skills as professionals (Brennan, 2017). Nurses' resilience evolves with time-based on repeated exposure to various field situations, coping with them, and overcoming them gradually for a long time. Many resilience studies for nurses have been using measurement tools developed for the general public. The tools developed in this study may contribute to a nurse's resilience measurement as a tool developed for nurses. Using the RNS developed through this study, it will be possible to provide basic data for the development of nursing resilience intervention and education program by confirming the pattern to individual nurses.

Conclusion

The significance of this study is to verify the reliability and validity of RNS developed for nurses and contribute to the generalization of tool use. This study is meaningful as it is the first to identify actual clinical nurses' resilience using a scale developed for nurses. The results of this study are recommended to be used as basic data for various studies regarding nurses' resilience improvement. Using the results of this research, further studies on the development of intervention and education programs to promote nurses' resilience and the validation of the effects are suggested.

Conflict of interest

None.

Funding

No external funding.

Acknowledgment

The authors would like to thank you to hospitals and nurses who participated in this study.

References

Brennan, E. J. (2017). Towards resilience and wellbeing in nurses. *British Journal of Nursing, 26*(1), 43–47.
Choi, M., & Kim, H. (2015). The effect of workplace bullying and ego-resilience on turnover intention of nurses in the public hospital. *Journal of the Korea Academia-Industrial Cooperation Society, 16*(5), 3257–3267.
Fitzpatrick, J. (2017). *Encyclopedia of nursing research.* Springer Publishing Company.
Garrett, C. (2008). The effect of nurse staffing patterns on medical errors and nurse burnout. *AORN Journal, 87*(6), 1191–1204.
Gillespie, B. M., Chaboyer, W., Wallis, M., & Grimbeek, P. (2007). Resilience in the operating room: Developing and testing of a resilience model. *Journal of Advanced Nursing, 59*(4), 427–438.
Hart, P. L., Brannan, J. D., & De Chesnay, M. (2014). Resilience in nurses: An integrative review. *Journal of Nursing Management, 22*(6), 720–734.
Hospital Nurses Association (2015). *Hospital nurse staffing status survey, annual report.* Hospital Nurses Association. Retrieved from http://khna.or.kr/web/information/resource.php.
Hudgins, T. A. (2016). Resilience, job satisfaction and anticipated turnover in nurse leaders. *Journal of Nursing Management, 24*(1), E62–E69.
Kang, J., & Lim, J. (2015). Effects of clinical nurses' resilience on job stress and burnout. *The Journal of the Korea Contents Association, 15*(11), 263–273.
Kim, B., Oh, H., & Park, Y. (2011). A study of nurses' resilience, occupational stress and satisfaction. *Korean Journal of Occupational Health Nursing, 20*(1), 14–23.
Kim, M. J., Park, Y. S., & Kwon, Y. (2015). The effects of clinical NursesResilience and social problem-solving ability on burnout. *Journal of the Korea Academia-Industrial Cooperation Society, 16*(2), 1284–1291.
Kim, S., & Park, S. (2016). Verification of validity and reliability of resilience scale for nurses. *Journal of the Korean Data Analysis Society, 18*(4B), 2257–2269.
Kim, S. N., & Yoo, M. S. (2014). Relationships between resilience, job stress, and organizational commitment in ICU nurses. *Journal of Korean Academic Society of Home Health Care Nursing, 21*.
Moon, I. O., Park, S. K., & Jung, J. M. (2013). Effects of resilience on work engagement and burnout of clinical nurses. *Journal of Korean Academy of Nursing Administration, 19*(4), 525–535.
Oh, E., & Chung, B. (2011). The effect of empowerment on nursing performance, job satisfaction, organizational commitment, and turnover intention in hospital nurses. *Journal of Korean Academy of Nursing Administration, 17*(4), 391–401.
Park, M. M., & Park, J. (2016). Development of resilience scale for nurses. *Journal of Korean Academy of Fundamentals of Nursing, 23*(1), 32–41.
Polk, L. V. (1997). Toward a middle-range theory of resilience. *Advances in Nursing Science, 19*(3), 1–13.
Rutter, M. (2008). Developing concepts in developmental psychopathology. *Developmental psychopathology and wellness: Genetic and environmental influences* (pp. 3–22). .
Ryu, K., & Kim, J. K. (2016). A study on relationships among resilience, stress, burnout and organizational commitment of hospital nurses. *The Journal of the Korea Contents Association, 16*(7), 439–450.
Williams, J., Hadjistavropoulos, T., Ghandehari, O. O., Malloy, D. C., Hunter, P. V., & Martin, R. R. (2016). Resilience and organisational empowerment among long-term care nurses: Effects on patient care and absenteeism. *Journal of Nursing Management, 24*(3), 300–308.
Yeun, Y. (2014). Job stress, burnout, nursing organizational culture and turnover intention among nurses. *Journal of the Korea Academia-Industrial Cooperation Society, 15*(8), 4981–4986.
Yu, J. (2012). *Yu jong pil professor's structural equation modeling concept and understanding.* Seoul: Hannarae Publishing Co.
Zautra, A. J., Hall, J. S., & Murray, K. E. (2010). A new definition of health for people and communities. *Handbook of adult resilience* (pp. 1). .