Resilience and its Associated Factors in Clinical Nurses: A Cross-sectional Study

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Abstract

Background: Resilience is the positive adaptation of people in reaction to unfavorable conditions. Meanwhile, nursing is a demanding occupation with extensive stress and challenges. This study aimed to determine the extent of resilience among nurses and its associated factors.

Methods: This cross-sectional study was performed on 320 nurses in Shahroud, Iran. Those with bachelor's degree of nursing and above, as well as at least one year of full-time clinical practice were chosen through convenience sampling technique. The data collection instruments were included Sherer's general self-efficacy scale and connor-davidson resilience scale. The data were analyzed by descriptive and inferential statistics (T-test, ANOVA, pearson correlation coefficient, and multiple linear regression).

Results: The present study showed that nurses experienced low levels of resilience (63.31±15.82) and high levels of self-efficacy (62.86±9.62). Furthermore, a positive and significant correlation was observed between resilience and self-efficacy of nurses (r=0.55, Pvalue<0.001). Satisfaction with personal protective equipment at the hospital of service and sense of safety against COVID-19 were noted as the factors associated with resilience and self-efficacy of nurses (Pvalue<0.05).

Conclusions: Based on the results of this study, provision of a safe environment with sufficient personal protective equipment as well as training the resilience skills and enhancing psychological capacity of nurses would play a key role in their positive adaptation to the tough and challenging conditions of the workplace.

Keywords: Resilience, Self-efficacy, Nurses.
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Introduction

Resilience is one of the most important abilities of humans, which causes effective adaptation to changes and stressful factors, and is an ability to show resistance to problems.[1] This personal ability indicates the person's capacity for positive and successful adaptation to challenging and tough conditions of life,[2] which facilitates interactions between the person and environment.[3] Through this ability, the person would be able to change the stressful conditions to an opportunity for learning and development, and by focusing on the problem, control the stress.[4]

Meanwhile, nursing because of its professional nature, is strenuous with extensive stress and challenges.[5] Indeed, the nature of hospital job, workplace conditions, longer working hours, taking care of very sick or terminal patients, the quantitative and qualitative pressure of the work, interpersonal conflicts, role ambiguity, organizational policies, occupational risks and harms, as well as the risk of contracting communicable diseases all cause incidence of occupational stress among nurses.[6,7] In addition, COVID-19 pandemic has caused other challenges for nurses including insufficient awareness about the behavior of coronavirus, lack of prepared care protocol for these patients, insufficient personal protective equipment and disinfectants, concerns over the family and children, and other issues, causing fear, anxiety, and burnout.[8] Thus, they should enjoy sufficient personal resilience so that under hard-working conditions, while keeping their own health, they also provide constant nursing care to patients.[2] Furthermore, based on studies conducted in recent years, prevalence of occupational stress among nurses employed in Iranian hospitals has been reported about 60%.[9] This statistic further highlights the importance of resilience and its associated factors in this occupation.

Resilience is a dynamic concept.[10] This concept in nurses depends on a series of internal and external factors. The internal factors include characteristics, abilities, and skills of the staff including insight, personal and professional experience, social qualifications and talents, emotional intelligence, self-belief, self-efficacy, being target-oriented, and attempts for achieving the goals, hope, optimism, faith, philanthropy, sympathy, creativity, problem-solving skills, flexibility, adaptation, and resistance to failure. All of these factors affect the nurses' abilities in adaptation to the stressful conditions of the workplace.[11,12] In contrast, the effects of external factors on the resilience of the staff include the external supportive and protective mechanisms such as familial, organizational, and social support, along with available resources and work-life balance. All of these help them adapt better to the stressful conditions of the workplace.[13,14]

Based on the results obtained from the study by Leng et al. (2020), there is no significant correlation between demographic characteristics such as gender, marital status, ward of service, as well as employment status of nurses and their resilience score, while the effect of age, level of education, clinical qualifications, and working background has been important on nurses' resilience.[15] The results obtained by Manomenidis et al. (2018) showed that education and ward of service are among the factors affecting resilience, while age and working

background did not have much relationship with resilience of nurses.[16] Nevertheless, the role of age, working background, education, and such factors in resilience of nurses is unclear.[11] Furthermore, the relationship of key factors such as social resources (family, friends, or peer support), physical activity, personal beliefs, or workplace with resilience is ambiguous.[17]

Thus, the contradictory findings pose this question: what are the personal or professional factors associated with resilience among nurses. Now, considering the importance of resilience in occupational success of nurses[18] and the different contradictory findings obtained, since so far limited studies have been conducted in Iran considering COVID-19 pandemic as well as the study gaps around this issue in the clinical settings of the country, the researchers intended to deal with determining resilience among nurses and its associated factors.

Materials and Methods

This is a cross-sectional study performed on 320 nurses employed in all clinical wards in Shahroud, Iran. The subjects were chosen through convenience sampling technique from Imam Hossein and Bahar hospitals. The inclusion criteria were having a bachelor's or higher degree in nursing and at least one year of full-time service in clinical practice. The sample size while considering the standard deviation of 15, accuracy of 1.6 at confidence level of 95%,[19] and consideration of 5% for dropout of the subjects was calculated equal to 370.

$$ n = \frac{z^2_{1-\frac{a}{2}} \sigma^2}{d^2} = \frac{(2)^2(15)^2}{(1.6)^2} = 351 $$

Demographic questionnaire: In this questionnaire, the information related to age, gender, marital status, education, working background, history of service at COVID-19 ward, income sufficiency, ward of service or activity, history of chronic physical disease (chronic physical diseases of importance in this study included cancer, arthritis, COPD , diabetes, CVD , hypertension, excessive obesity, osteoporosis, and stroke, which were captured based on self-expression of nurses.), satisfaction with the personal protective equipment, and the nurse's sense of safety.

Sherer's general self-efficacy scale (SGSES): For measuring the self-efficacy, Sherer's general self-efficacy scale was used. This instrument includes 17 items which are scored based on a 5-point Likert scale from 1 (absolutely disagree) to 5 (absolutely agree). The reverse scored items of this questionnaire are 2, 4, 5, 6, 7, 10, 11, 12, 14, 16, and 17 (i.e. "absolutely disagree" receives score 5 and "absolutely agree" receives score 1). For calculating the total score of the questionnaire, the score of all items is summed up together, whereby a number between 17 and 85 is obtained. Scores 17-36 represent low self-efficacy, 37-56 moderate self-efficacy, and 57-85 high self-efficacy. Sherer et al. (1982) calculated the Cronbach alpha coefficient of this scale as 0.86.[20] Pourtaghi et al. (2013) reported the reliability of the Persian version of this questionnaire based on Cronbach alpha method as 0.89.[21] The reliability of the Persian version of this questionnaire in the present research was also calculated 0.88 based on Cronbach alpha method.

Connor-Davidson resilience scale (CD-RISC): The extent of resilience was measured using Connor-Davidson resilience scale. This instrument includes 25 items, based on a 5-point Likert scale (absolutely not true=0, rarely true=1, sometimes true=2, often true=3, and always true=4), whose total score ranges from 0 to 100, whereby the score of each subject is equal to the sum of the scores of each of the items. In order to obtain the total score of the questionnaire, the sum of the scores of all items is summed up together, which will range from 0 to 100. The higher the score, the greater is the resilience of the respondent and vice versa1. Scores 0-65 represent low resilience, 66-79 moderate resilience, and 80-100 high resilience.[19] The results of factor analysis suggested that this scale has five factors of personal qualification perception (items 10, 11, 12, 16, 17, 23, 24, 25), trusting personal instincts and tolerating negative effects (items 6, 7, 14, 15, 18, 19, 20), positive acceptance of change and safe relations (items 1, 2, 4, 5, 8), control (items 13, 21, 22), and spiritual effects (items 3 and 9). Connor and Davidson (2003) reported 0.89 as the Cronbach alpha coefficient for their resilience scale1. Validity (via factor analysis and convergent and divergent validity) and reliability (through retest method and Cronbach alpha method) of the scale were confirmed by the test designers across different groups (normal and at-risk). In the study by Samani et al. (2007), 0.87 was obtained as the Cronbach alpha coefficient for the reliability of Persian version of this questionnaire.[22] The validity and reliability of the Persian version of this questionnaire were also investigated by Derakshanrad et al. (2014), whereby the Cronbach alpha coefficient was calculated 0.89.[23] In the present research, the reliability of the Persian version of this questionnaire was obtained 0.94 based on Cronbach alpha method.

For describing the data, descriptive statistics were used (frequency, percentage, mean, and standard deviation). Comparison of the resilience score of the nurses per demographic characteristics was also done using T-test and ANOVA. Furthermore, to explore the correlation between resilience and self-efficacy, Pearson correlation coefficient was used. The relationship of other demographic variables with resilience was also examined using multiple linear regression model.

The necessary permissions were acquired from ethics committee in research of Shahroud university of medical sciences (ethics code: IR.SHMU.REC.1400.267). Also, the necessary coordination was made at hospital. Next, the research goals were explained to all nurses and their consent for participation in this study was taken. The questionnaires were distributed in each ward among nurses, and they were asked to complete the questionnaires in their free time and give them back to the researcher within 48 hours.

Result

In this study, out of 370 distributed questionnaires, 320 questionnaires were returned back to the researcher completely (response rate: 86.84%). 86.3% of nurses were female (n=276) and 13.8% (n=44) were male. The mean and standard deviation of age (years), working background (years), and background of working in the COVID-19 ward (months) of the participating nurses were 33.33±6.55, 9.56±6.15, 6.05±10.16, respectively. In the present study, nurses received a mean self-efficacy score of 62.86±9.62. The mean resilience score of the studied individuals was also obtained 63.31±15.82. The demographic

characteristics and the mean scores of resilience and self-efficacy of nurses based on these characteristics are reported in table 1. Investigation of the resilience subscales also showed that the highest mean score of items was related to the subscale spiritual effects (2.78±0.88 out of 4), and the minimum mean score of the items was associated with the trusting personal instincts and tolerating negative effects subscale (2.36±0.69 out of 4).

Based on the obtained results, the mean scores of resilience and self-efficacy of nurses in terms of variables of gender, level of education, income sufficiency, ward of service, history of chronic physical disease, age, working background, and history of working in COVID-19 ward did not differ significantly. The mean score of resilience of nurses did not differ significantly either between married and single groups (Pvalue=0.753). However, there was a significant difference between the self-efficacy of married and single individuals (Pvalue=0.031); the single nurses enjoyed greater self-efficacy.

The results of one-way analysis of variance test suggested significant difference of the mean score of resilience of nurses in terms of two variables of satisfaction with personal protective equipment (Pvalue=0.018) and sense of safety (Pvalue=0.009). Tukey post-hoc test was used for further investigation of intergroup differences. The results of this test showed that resilience of nurses with very high satisfaction with personal protective equipment differed significantly in comparison to the resilience of nurses with very low satisfaction (Pvalue=0.036) and low satisfaction (Pvalue=0.038). Nurses with very high sense of safety also reported greater resilience compared to the nurses with very low (Pvalue=0.015) and moderate (Pvalue=0.027) sense of safety.

Table 1. The mean scores of resilience and self-efficacy based on demographic distribution

Variable		N	%	Resilience			Self-efficacy		
				Mean	SD	P.value	Mean	SD	P.value
Gender	Male	44	13.8	64.36	19.31	0.635 *	63.82	10.74	0.476 *
	Female	276	86.3	63.14	15.22		62.70	9.45	
Marital status	Married	241	75.3	63.15	14.59	0.753 *	62.19	9.46	0.031 *
	Single	79	24.7	63.80	19.19		64.89	9.90	
Education	BSc	303	94.7	63.18	15.95	0.553 *	62.81	9.72	0.690 *
	MSc	17	5.3	65.53	13.44		63.76	7.80	
Income sufficiency	Excellent	2	0.6	62.00	28.28		69.00	11.31	
	Above average	23	7.2	61.04	18.29		59.00	9.30	
	Average	94	29.4	64.12	14.57	0.886 **	63.07	8.93	0.203 **
	Below average	136	42.5	63.71	14.45		63.65	8.79	
	Very poor	65	20.3	62.15	19.15		62.05	11.93	
Ward	Internal	60	18.8	63.85	12.55		63.93	7.89	
	Surgery	44	13.8	65.05	16.21		64.25	9.44	
	Neonatal and pediatric	19	5.9	65.32	11.77		65.95	7.34	
	Maternity	37	11.6	65.49	11.78	0.725 **	61.00	9.40	0.459 **
	Psychiatry	8	2.5	65.00	14.95		59.13	11.36	
	ICU	92	28.8	62.59	18.60		62.29	11.05	
	Emergency Room	40	12.5	59.30	18.36		62.25	9.65	
	Operating Room	20	6.3	62.60	15.31		62.35	9.21	
History of chronic physical disease	No	282	88.1	63.63	15.61	0.317 *	63.04	9.54	0.365 *
	Yes	38	11.9	60.89	17.31		61.53	10.29	
Satisfaction with PPE	Not at all satisfied	32	10.0	58.56	21.95		59.84	9.19	
	Slightly satisfied	45	14.1	59.56	19.77		61.22	10.28	
	Moderately satisfied	99	30.9	62.79	13.37	0.018 **	62.71	8.95	0.024 **
	Very satisfied	92	28.8	64.36	13.17		62.91	9.30	
	Extremely satisfied	52	16.3	68.62	15.00		66.31	10.41	
Sense of safety	Much lower	59	18.4	60.00	18.28		61.07	9.45	
	Lower	73	22.8	64.60	16.57		64.12	8.26	
	About the same	124	38.8	61.60	14.21	0.009 **	61.31	9.71	0.004 **
	Higher	49	15.3	66.35	14.78		65.20	10.47	
	Much higher	15	4.7	74.20	12.04		68.80	9.20	
Age (years)	25>	27	8.4	61.33	14.29		62.04	8.15	
	25-30	114	35.6	63.45	14.90		62.88	9.59	
	30-35	69	21.6	61.25	15.83	0.634 **	61.42	8.73	0.590 **
	35-40	66	20.6	65.03	16.60		63.82	10.66	
	40-45	28	8.8	66.29	17.20		64.96	10.45	
	45<	16	5.0	62.25	19.35		62.63	10.24	
Working background (years)	5>	107	33.4	63.05	16.27		62.13	10.42	
	5-10	90	28.1	61.53	15.04	0.483 **	62.66	8.91	0.563 **
	10-15	71	22.2	65.32	14.15		64.21	8.84	
	15<	52	16.3	64.17	18.27		62.85	10.20	
Working background in the COVID-19 ward (months)	12>	265	82.8	62.81	15.58		62.54	9.64	
	12-24	37	11.6	64.19	16.54	0.277 **	63.16	9.14	0.184 **
	24<	18	5.6	68.83	17.59		66.83	9.90	

N. Frequency; %. Percent; SD. Standard Deviation; BSc. Bachelor of Science; MSc. Master of Science; PPE. Personal Protective Equipment; *. Independent T-test; **. One-way ANOVA

The results of this test also indicated that the mean score of self-efficacy of the participants in terms of two variables of satisfaction with personal protective equipment (Pvalue=0.024) and sense of safety (Pvalue=0.004) differed significantly. The mean score of self-efficacy of nurses with very high satisfaction and very low satisfaction with personal protective equipment differed significantly (Pvalue=0.023). Nurses enjoying very high sense of safety also experienced higher levels of self-efficacy compared to nurses with very low sense of safety (Pvalue=0.040) and moderate sense of safety (Pvalue=0.033).

The results of multiple linear regression also showed that the mean self-efficacy score of marriage nurses was 3.49 units lower than that of the single nurses (Pvalue=0.004). Further, the extent of self-efficacy of nurses enjoying very high satisfaction with the personal protective equipment was 5.71 units higher compared to the nurses with very low satisfaction (Pvalue=0.021). The role of other independent variables in resilience and self-efficacy of the participating nurses is summarized in table 2. Based on the results of Pearson correlation coefficient, a positive and significant correlation was found between self-efficacy and resilience of nurses (r=0.55, Pvalue<0.001).

Table 2. The role of independent variables on resilience and self-efficacy based on multiple linear regression model

Variable		Resilience				Self-efficacy			
		Coef.	SE	t	P>|t|	Coef.	SE	t	P>|t|
Age		-0.112	0.353	-0.320	0.750	0.057	0.209	0.270	0.787
Gender	Male (Reference)								
	Female	-1.789	2.644	-0.680	0.499	-1.505	1.566	-0.960	0.337
Marital status	Married (Reference)								
	Single	0.010	2.028	0.010	0.996	3.494	1.201	2.910	0.004
Education	BSc (Reference)								
	MSc	4.056	4.231	0.960	0.339	1.012	2.506	0.400	0.687
Working background		0.103	0.383	0.270	0.789	-0.027	0.227	-0.120	0.904
	Excellent (Reference)								
	Above average	0.377	12.028	0.030	0.975	-8.440	7.123	-1.180	0.237
Incomesufficiency	Average	4.215	11.720	0.360	0.719	-3.693	6.941	-0.530	0.595
	Below average	4.480	11.712	0.380	0.702	-2.786	6.936	-0.400	0.688
	Very poor	3.133	11.746	0.270	0.790	-4.448	6.956	-0.640	0.523
	Not at all satisfied (Reference)								
	Slightly satisfied	-0.719	3.894	-0.180	0.854	0.661	2.306	0.290	0.774
Satisfaction with PPE	Moderately satisfied	3.693	3.493	1.060	0.291	3.252	2.068	1.570	0.117
	Very satisfied	4.339	3.730	1.160	0.246	2.501	2.209	1.130	0.258
	Extremely satisfied	7.362	4.150	1.770	0.077	5.716	2.458	2.330	0.021
	Much lower (Reference)								
	Lower	3.921	3.006	1.300	0.193	3.242	1.780	1.820	0.070
Sense of safety	About the same	-0.313	2.819	-0.110	0.912	-0.574	1.669	-0.340	0.731
	Higher	4.142	3.486	1.190	0.236	3.212	2.065	1.560	0.121
	Much higher	10.080	5.182	1.950	0.053	4.751	3.069	1.550	0.123
		R^2=0.0701, Adj R^2=0.0178				R^2=0.1188, Adj R^2=0.0692			

Coef. Coefficient; SE. Standard Error; BSc. Bachelor of Science; MSc. Master of Science; PPE. Personal Protective Equipment

Discussion

The present study was performed to determine the extent of resilience among nurses and its associated factors. In this study, the mean resilience score of participating nurses was 63.31±15.82, suggesting their low resilience. This value was also reported as poor in the study by Afshari et al. (2020) (61.18±14.80), which concurs with the present study findings.[24] In the study by Hernandez et al. (2016), the nursing personnel of air force of the US acquired a mean score of 75.12±40.68, indicating their average level of resilience.[25] Note that this study has been performed before the COVID-19 pandemic. Thus, this difference can be attributed to the outbreak of this newly emerging virus and its impact on the resilience of the healthcare system staff.

In examining the subscales of resilience, the largest mean score of items was related to the spiritual effects subscale (2.78±0.88 out of 4). In the study by Alamedin et al. (2020), which had been done on nurses of Lebanon country, the highest mean score of the items was related to this subscale as well (2.97±0.76 out of 4).[26] This highlights the important role of spirituality and religion among nurses in the Middle Eastern region. Indeed, religion, spirituality, and personal beliefs can

help in better adaptation to stressful conditions of the workplace and life for nurses, thereby boosting their flexibility against problems.[27] Furthermore, the lowest mean score of items was related to the trusting personal instincts and tolerating negative affects subscale (2.36±0.69 out of 4). This finding was in line with the study by Alamedin et al. (2020), whereby they also found the minimum mean score of items related to this subscale (2.48±0.60 out of 4).[26] Alamedin et al. (2020) attributed the low mean score of items in the two subscales of trusting personal instincts and tolerating negative effects (2.48±0.60 out of 4) and personal qualification perception (2.66±0.61 out of 4) to low self-efficacy of nurses.[26] This can be due to lack of a specific instrument for measuring the participants' self-efficacy. In the present study, in spite of the low mean score of items in these two subscales, 21.6% of nurses experienced average levels of self-efficacy and 77.5% of nurses reported high levels of self-efficacy.

The results of this study showed that increased satisfaction with personal protective equipment at the hospital of service is associated with greater resilience for nurses. In this regard, Huang et al. (2020) noted access to adequate personal protective equipment as one of the factors associated with

resilience of the healthcare system staff during COVID-19 pandemic.[28] Note that the deficiency of this equipment can cause them to become sick when taking care of patients with COVID-19, which will be associated with at least 14 days of absence from work. Accordingly, reduction of the nursing workforce, increased working load on the personnel, and exhaustion will occur among them.[29] Based on the obtained results, sense of safety against COIVD-19 is another factor associated with resilience of nurses. In this regard, based on the study of Jo et al. (2020) the nurses who had greater fear from contracting COVID-19 experienced lower levels of resilience and greater tendency to quit their job.[30] Thus, nursing managers through providing a safe environment with adequate personal protective equipment play a key role in enhancing the resilience and self-efficacy of nurses.

Furthermore, no significant relationship was found between gender and resilience of nurses. This was in line with the study by Leng et al. (2018) (15). However, in the study by Afshari et al. (2020), the resilience score acquired by the female nurses was significantly lower compared to their male counterparts.[24] This can result from the few number of male participating nurses (13.8%) in the present study. Also, the nurses who had a history of chronic physical disease experienced lower levels of resilience, though no significant relationship was found between this variable and resilience. However, different studies have regarded general health as one of the influential factors on resilience of nurses.[31,32] In this study, only 11.9% (n=38) of the participants had history of chronic physical disease. This may explain the insignificance of this result. In this study, only 7.8% (n=25) of the nurses considered their income as sufficient and very sufficient for their living costs. The mean scores of resilience and self-efficacy of nurses did not differ significantly in terms of this variable. Nevertheless, in the study by Guo et al. (2017), a significant difference was observed between resilience of subjects in terms of their monthly income.[33] Wei and Taormina (2014) also considered their monthly income as one of the factors affecting resilience of nurses, and noted it as a factor for adapting to problems.[34] The reasons of this discrepancy can include differences in the examined sample size and the method of measuring the participants' level of income.

Based on the results of multiple linear regression model, the self-efficacy of single nurses was considerably higher than that of married nurses. Nevertheless, in the study by Choi et al. (2022) performed on nurses in South Korea, the married nurses showed higher levels of self-efficacy and lower levels of stress for terminal care.[35] This discrepancy can arise from the sociocultural conditions governing the societies, as well as the different lifestyles between Iranian and South Korean people. In this study, no significant relationship was found between age as well as working background and resilience of nurses. This finding concurred with the study of Alamedin et al. (2020).[26] However, in the study by Leng et al. (2020), nurses with a higher agent working background showed greater resilience.[15] Note that the sampling of this study has been performed before the coronavirus outbreak. Thus, this difference can be attributed to the fact that lack of sufficient awareness about the behavior of this virus and lack of preparation of care protocols for its patients have overshadowed the resilience of all nurses regardless of their age and working background.

Furthermore, a positive and significant relationship was observed between resilience and self-efficacy of nurses. In this regard, different studies have noted self-efficacy as one of the factors associated resilience of nurses.[33,36,37] Those with higher self-efficacy showed greater competence and tolerance against the challenges of life, and are more resilient to stresses and problems. Accordingly, improvement of self-efficacy of nurses would be associated with their enhanced resilience.

Since this study was performed only on the nurses employed in educational hospitals, its results may not be generalizable to the healthcare centers affiliated with other medical sciences universities of the country as well as non-educational hospitals nonacademic centers such as private healthcare centers. Accordingly, future studies are suggested to conduct a similar study with a longitudinal design and larger sample size.

The results of this study showed that most nurses had low resilience. Further, a positive and significant correlation was observed between self-efficacy and resilience of nurses. Sense of safety against COVID-19 and satisfaction with the personal protective equipment were also noted as the factors associated with resilience of nurses. Accordingly, holding training workshops for resilience skills and improving the awareness as well as performance of nurses about this newly emerging virus are recommended for enhancing their resilience and adaptation to the current critical and stressful conditions. Nursing managers can also play a key role in boosting the resilience and self-efficacy of nurses through providing a safe environment with sufficient personal protective equipment.

Acknowledgement

Conflict of Interest

The authors declare that they have no conflict of interest.

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