

A comparison in terms of resilience and anxiety between nurses working in COVID-19 wards and nurses working in other wards: a descriptive cross-sectional study in southern Iran

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Abstract

Introduction: Nurses as health defenders in the front line of COVID-19 are among the high-risk and vulnerable groups for this disease. Moreover, they experience a lot of anxiety as well as psychological and emotional strain. In such situations, it is extremely important to pay attention to their resilience. Therefore, the present study attempted to compare resilience and anxiety between nurses working in the COVID-19 wards and nurses working in other wards in southern Iran in 2020.

Material and methods: This descriptive cross-sectional study was conducted by complete enumeration, meaning that the sampling process was done in a full-census manner. For the purpose of this study, 1857 nurses (866 nurses working in the COVID-19 wards and 991 nurses working in other wards) were included. To collect the required data, this study applied demographic surveys, the Corona Disease Anxiety Scale (CDAS), and the Connor-Davidson Resilience Scale (CD-RISC).

Results: The mean and standard deviation of the anxiety and resilience scores of nurses working in the COVID-19 wards were 44.11 ± 7.48 and 73.09 ± 15.76 , respectively. Moreover, the anxiety and resilience scores of nurses working in other wards were 41.57 ± 6.70 and 75.58 ± 8.34 , respectively. Also, a statistically significant correlation was found between resilience and anxiety ($r = -0.47, p < 0.001$).

Conclusions: This study showed that nurses are dealing with high levels of anxiety during the COVID-19 pandemic. It was concluded that due to the effect of resilience on the reduction of anxiety, nurse managers must apply the necessary psychological skill programs, in order to enhance psychological capabilities, improve nurses' resilience, and reduce coronavirus anxiety.

Key words: COVID-19, anxiety, resilience, nurses.

Introduction

Nurses face various types of stress due to the nature of their occupation; for instance, they are always exposed to highly contagious and deadly infectious diseases, including the novel coronavirus infection (COVID-19), which can consequently cause physiological and psychological destructive effects such as stress and anxiety (Wang *et al.* 2020). COVID-19 was first identified in China in 2019, then rapidly spread to all parts of the world. Therefore, this outbreak was announced as a pandemic by the World Health Organization (Lai *et al.* 2020). In January 2020, the World Health Organization identified the coronavirus epidemic as a public health

emergency of international concern (PHEIC) (Santarone *et al.* 2020). This organization also reported that nurses as health defenders in the front line of COVID-19 are among the high-risk groups vulnerable to coronavirus. Moreover, they consequently experience a lot of anxiety as well as psychological and emotional strain (Legido-Quigley *et al.* 2020). Roy *et al.* (2020) reported that nurses are mostly suffering from stress, anxiety, depression, and post-traumatic stress disorder (PTSD) during the COVID-19 pandemic. Accordingly, it is necessary for health-care executives and the Emergency Management Committee to pay special attentions to the psychological health status, levels of anxiety

and depression, and occupational burnout. Under critical and complex conditions such as the COVID-19 pandemic, it is essential to pay more attention to the individual and psychological capacities, which could help a person in resisting, surviving, and even improving his/her personality traits in such difficulties (Motie *et al.* 2021). One of the most influential human capabilities, which helps people to be effectively adapted to stressful conditions as well as psychological and emotional strains and consequently increases their resistance to problems, is resilience (Cooke *et al.* 2016).

Resilience is defined as a person's capability to resist problems or to return to his/her normal status after facing a stressful situation (Ang *et al.* 2018; Scoloveno *et al.* 2016). The study by Liu *et al.* (2020) showed that nurses mostly experience high stress and anxiety due to a lack of high resilience and psychological capabilities in taking care of patients in the current COVID-19 crisis. Moreover, Jackson (2018) stated that nurses should particularly promote their workplace resilience especially under critical and tough conditions at work so that they can overcome their negative experiences and then convert them into positive ones. Actually, resilience corrects or modifies the adverse effects of unfavorable conditions at work, increases the psychological health statuses of medical staff, and improves the nurses' quality of care. Otherwise, nurses will experience poor working conditions, which can subsequently damage them psychologically. Accordingly, it is very difficult to show professional skills and provide high-quality professional healthcare services in such an environment and working conditions.

Background in Iran

The pattern of spread of COVID-19 has been complex in Iran. Currently, Iran is faced with the fourth wave of the pandemic, while many other countries are going through the second wave. Although the majority of Iranian people wear masks, the country's inappropriate economic situation has put very few restrictions on work, activity, and travel in all cities; therefore, a large number of people use public transportation every day, and the streets are crowded. In addition, all employees are at work every day and the rate of telecommuting from home is very low. These factors have led about 2 million Iranian people to become infected with COVID-19, of whom over 65,000 have lost their lives. During the COVID-19 pandemic, more than 100,000

nurses in Iranian hospitals became infected with the coronavirus. Iranian nurses, similar to nurses working in other countries, have experienced high job anxiety and stress in the current COVID-19 crisis.

Due to the high spread of COVID-19 and the consequent involvement of medical staff, especially nurses who are known as health defenders in the front line of COVID-19, it was necessary to use the results of the previous studies conducted on the above-mentioned issues; however, no study was found on the comparison of resilience and anxiety between nurses working in the COVID-19 wards and nurses working in other wards in Iran. Therefore, the present study was designed to compare resilience and anxiety in nurses working in the COVID-19 wards and nurses working in other wards in southern Iran in 2020.

Material and methods

This was a descriptive cross-sectional study. The statistical population of this research included the nurses working in teaching hospitals affiliated to Shiraz, Fasa, Jahrom, Darab, and Larestan Universities of Medical Sciences in southern Iran. This study was conducted using convenience sampling. Nurses who met the inclusion criteria were then invited to participate in the study. Finally, 1857 nurses (866 nurses working in the COVID-19 wards and 991 nurses working in other wards) were enrolled in the current study.

The needed data were gathered within four months from September to December 2020. The inclusion criteria were being willing to participate, having at least one year's work experience and not having any severe physical or mental health problems. Subjects who failed to answer over half of the questions on the questionnaires and did not return the questionnaires were excluded.

In the present study, it was attempted to fill out the questionnaires via phone call, email, and in some cases in person in terms of the health protocols to control the spread of this infectious disease. Demographic surveys (including different items such as age, gender, educational level, work experience, and marital status), the Corona Disease Anxiety Scale, and a resilience questionnaire were used to gather data.

The Corona Disease Anxiety Scale was prepared and then validated to measure anxiety caused by coronavirus in Iran. Correspondingly, the final version of the present questionnaire

consists of 18 items which address two dimensions: items 1 to 9 address psychological factors and items 10 to 18 assess physical factors, which were ranked on a four-point Likert scale (*never* = 0, *sometimes* = 1, *usually* = 2, and *always* = 3). Therefore, the highest and lowest scores that can be obtained by the participants were 0 and 54, respectively. Scores ranging from 0 to 16 show no anxiety or mild anxiety, scores ranging from 17 to 29 show moderate anxiety, and scores ranging from 30 to 54 show severe anxiety. The Cronbach's alphas of the first and second dimensions were found to be 0.87 and 0.86 respectively. The Cronbach's α of the entire instrument was found to equal 0.91. (Alipour *et al.* 2020). Another study in Iran reported the internal homogeneity of the questionnaire to equal a Cronbach's α of 0.89 (Amirfakhraei *et al.* 2020).

The Connor-Davidson Resilience Scale has 25 questions scored from zero (*never*) to four (*always*). To obtain the total score on this scale, all scores should be added up. The final score ranges from 0 to 100. Scores ranging from 0 to 33 indicate poor resilience, scores ranging from 34 to 67 indicate moderate resilience, and scores greater than 68 indicate good resilience (Connor and Davidson 2003).

Mohammadi *et al.* (2006) translated this questionnaire and also validated it. To assess the reliability of the scale, the researchers measured its Cronbach's α . To assess the validity of the scale, the researchers used the confirmatory factor analysis method – the results showed that the instrument was a one-factor scale. The Cronbach's α was found to be 0.93. Similarly, Bigdeli *et al.* (2013) confirmed that the instrument is reliable with a Cronbach's α of 0.9.

Ethical considerations

All participants gave written informed consent to participate in the study. The present study was conducted in accordance with the principles of the revised Declaration of Helsinki, a statement of ethical principles which guides physicians and other participants in medical research involving human subjects. The participants were assured of their anonymity and confidentiality of their information. Moreover, the study was approved by the local Ethics Committee of Fasa University of Medical Sciences, Fasa, Iran (Ethical code: IR.FUMS.REC.1399.096).

Statistical analyses were performed using the independent *t*-test, Mann-Whitney *U* test, linear regression, χ^2 test, Kruskal-Wallis test, and Spearman's correlation coefficient in SPSS software (version 22.0). Also, the *p*-value less than 0.05 ($p \leq 0.05$) was considered as statistically significant.

Results

Out of 1857 nurses who participated in this study, 866 were working in the COVID-19 ward and 991 nurses were working in other wards. Table 1 illustrates other demographic characteristics of the participants.

The results showed that the mean and standard deviation of the anxiety and resilience scores of the nurses working in the COVID-19 wards were 44.11 ± 7.48 and 73.09 ± 15.76 , respectively. Furthermore, the anxiety and resilience scores of the nurses working in other wards were obtained as 41.57 ± 6.70 and 75.58 ± 8.34 , respectively. Additionally, a significant relationship was observed between age and work experience in the nurses working in the

Table 1. Frequency distribution of demographic characteristics of the subjects in terms of gender, marital status, and educational level

Variables	COVID-19 ward		Other wards		P-value
	n	%	n	%	
Gender					
Male	255	29.4	536	54.1	< 0.001
Female	611	70.6	455	45.9	
Marital status					
Single	356	41.1	455	45.9	0.039
Married	510	58.9	536	54.1	
Level of education					
Associate degree	42	4.8	3	0.3	< 0.001
Bachelor of Science	748	86.4	925	93.3	
Master of Science	76	8.8	48	4.8	
Ph.D.	0	0	15	1.5	

χ^2 test

COVID-19 ward and other wards and their levels of anxiety and resilience (Table 2).

Spearman's rank correlation coefficient showed a significant relationship between resilience and anxiety. In this regard, as resilience score increases, patients' anxiety decreases ($p < 0.001$, $r = -0.47$). Spearman's rank correlation coefficient also showed a significant relationship of age and work experience with anxiety and resilience levels (Table 3).

In the present study, the findings showed a significant relationship between gender and the nurses' anxiety and resilience, in such a way that the male nurses showed lesser anxiety and higher resilience compared to the female nurses. In addition, no significant relationship was found between these levels and degree of education (Table 4).

The results of the linear regression test showed that there was a significant correlation between

gender, level of education and ward on the one hand and resilience and anxiety on the other (Table 5).

Discussion

COVID-19 disease is a life-threatening disease that has frightened all people worldwide. Its high rates of incidence and mortality all over the world have led humans to experience lots of psychological and emotional strain. Moreover, this disease has deeply affected people's lives and social activities and consequently their mental and psychological security (Cai *et al.* 2020; Habibzadeh *et al.* 2020), especially those of the treatment team and nurses in particular. This is because they are in direct physical contact with patients with COVID-19. It is clear that nurses experience high levels of anxiety and stress when providing care for these patients (Xiang *et al.* 2020).

Table 2. Relationship among age and work experience of nurses working in the COVID-19 ward and nurses working in other wards and their levels of anxiety and resilience

Variables	COVID-19 ward		Other wards		P-value
	Mean	SD	Mean	SD	
Age	34.66	7.53	33.70	7.92	0.008
Job experience	10.72	6.42	9.50	6.69	< 0.001
Anxiety	44.11	7.48	41.57	6.70	–
Resilience	73.09	15.76	75.58	8.34	–

T-test and Mann-Whitney U test

Table 3. Relationship among nurses' age and work experience and their anxiety and resilience levels

Variables	Anxiety		Resilience	
	Spearman's rank correlation coefficient	P-value	Spearman's rank correlation coefficient	P-value
Age	0.057	0.017	0.011	0.629
Job experience	0.076	0.001	0.016	0.481

Spearman's rank correlation coefficient

Table 4. Relationship among nurses' gender, education, and marital status and their anxiety and resilience levels

Variables	Anxiety			Resilience		
	Mean	SD	P-value	Mean	SD	P-value
Gender						
Male	44.45	6.67	0.024	76.02	11.55	< 0.001
Female	40.54	7.12		72.26	12.81	
Marital status						
Single	42.57	7.23	0.29	73.38	12.30	0.33
Married	42.89	7.15		57.23	12.46	
Level of education						
Associate degree	41.02	7.85	0.29	73.15	11.76	0.33
Bachelor of Science	43.19	7.23		74.96	12.33	
Master of Science	38.22	4.01		67.54	12.67	
Ph.D.	36.33	2.66		75.00	0.000	

Table 5. Relationship between variables affecting anxiety and resilience using linear regression

Variable	Anxiety			Resilience		
	SE β	β	P-value	SE β	β	P-value
(Constant)	1.595	45.923	< 0.001	2.825	68.773	< 0.001
Gender	0.333	3.381	< 0.001	0.590	4.845	< 0.001
Marital status	0.324	-0.449	0.166	0.575	-2.224	< 0.001
Education level	0.461	-2.493	< 0.001	0.818	-3.121	< 0.001
Ward	0.330	-1.703	< 0.001	0.585	3.940	< 0.001
Age	0.038	0.028	0.458	0.067	0.051	0.443
Job experience	0.045	-0.105	0.019	0.079	-0.015	0.847

The findings of this study showed that the mean score of anxiety in the nurses working in the COVID-19 ward was higher than that of the nurses working in other wards. It should be mentioned that the mean score of anxiety in the nurses working in other wards during the coronavirus pandemic was so high, as well. Mohammadi *et al.* (2021) in their study found that nurses caring for patients with COVID-19 experience a high level of anxiety. Furthermore, based on the participants' experiences, it was found that in those nurses who had psychological abilities; resilience could better adapt them to complex and stressful situations. In this study, Spearman's rank correlation coefficient showed a significant relationship between the levels of resilience and anxiety. In this regard, as the level of resilience increases, the level of anxiety decreases.

Odom-Forren (2020) also reported that nurses working during the COVID-19 pandemic experience higher anxiety than other medical staff, so this can adversely affect the quality of healthcare delivery, patients' safety, and nurses' quality of working life. Therefore, the health system policymakers should take the necessary measures and employ strategies to increase the resilience, psychological skills, and mental health statuses of nurses. Khanmohammadi *et al.* (2020) performed a study on 150 nurses working in a COVID-19 ward in northern Iran, in order to evaluate job stress and resilience. They observed that the mean score of job stress in these nurses was high. They also reported that the mean score of resilience was medium in them. Based on the findings of this study, an inverse relationship was found between resilience and job stress. In the present study, the mean scores of resilience in the nurses working in the COVID-19 wards and other wards were higher than in the aforementioned study, and this difference was due to different sample sizes and locations of study. It also shows that there was a significant relationship among work experience, age, and resilience;

in other words, resilience increases along with aging and an increase in work experience, and this finding is consistent with that of the above-mentioned study.

Doo *et al.* (2021) performed a study on 130 nurses in South Korea to compare the levels of anxiety, depression, and resilience between nurses working in a COVID-19 ward and nurses working in other wards. They observed that the mean scores of anxiety and depression were higher in these nurses compared to nurses working in other wards. They reported that the level of resilience in these nurses was medium, and also found a significant relationship between anxiety and resilience, which was consistent with the finding of the present study. This study indicated that there was significant relationship among age, resilience, and anxiety, which is consistent with the result of the present study. In another study by Roberts *et al.* (2021) on 255 nurses working in a COVID-19 ward in the USA to examine their levels of anxiety and resilience, it was observed that 20.9% of nurses suffered from severe anxiety. The mean score of resilience in 65% of nurses was between medium and high. Additionally, a significant relationship was observed among work experience, age, resilience, and anxiety, which was consistent with the results of this study.

In the present study, the Spearman's correlation coefficient showed that there was a significant correlation between resilience and anxiety: higher resilience scores correlated with lower anxiety in the patients. On a similar note, the results of the study of Setiawati *et al.* (2021) conducted in Indonesia show that the personnel who work in hospital wards assigned to COVID-19 patients experience higher levels of anxiety than the personnel in other wards do. Also, the personnel with less resilience experience greater anxiety, a finding which is consistent with the results of the present study. According to the study of Zhang *et al.* (2020),

due to their lack of resilience skills, the nurses who practice in COVID-19 wards are exposed to greater occupational burnout and anxiety than other nurses are. It can be reasoned that the mental stress caused by direct contact with COVID-19 patients and the high risk of contracting COVID-19 increase nurses' anxiety over occupational injuries. Being among the top 10 countries extensively affected by COVID-19, Iran is a country where its healthcare personnel are currently dealing with the fourth wave of the infection and a fifth wave is forming in a few of its provinces. Over recent months, nurses and other members of treatment teams have been working intensively under great stress caring for COVID-19 patients. Providing safe, quality care to COVID-19 patients under the current complicated conditions entails possessing psychological capabilities, including resilience. Thus, nursing administrators must employ effective strategies, e.g. resilience training and stress management, to decrease nurses' anxiety and exposure to occupational injuries and enhance their resilience. Travers *et al.* (2020) reported that the psychological empowerment of nurses in COVID-19 hospital wards lowers their occupational anxiety and improves their resilience skills.

Limitations

One of the most important limitations of the present study was that some questionnaires were not completed and sent via e-mail, which may be due to the busy schedule of nurses during the coronavirus pandemic. Time limitation can be regarded as another limitation of the study. Since the variables were measured within 4 months, it is suggested that nurses' anxiety and resilience should be examined over a longer period; therefore, more accurate results on estimation of job stress and nurses' resilience can be achieved. Consequently, health system managers and policymakers can develop more comprehensive programs for the current crisis or similar crises based on these findings.

Conclusions

Nurses who care for COVID-19 patients and have to work long shifts suffer from higher levels of anxiety and are less resilient. Given the persistence of the COVID-19 crisis in the world and in Iran, it is essential that healthcare authorities take effective measures to lower nurses' anxiety and improve their resilience and psychological well-being. Nurse administrators can use the

findings of the present study to provide a more appropriate work environment for nurses and to develop comprehensive plans to support nurses in the current and future crises.

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Disclosure

The authors declare no conflict of interest.

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