Acta Scientiarum

http://periodicos.uem.br/ojs
ISSN on-line: 1807-8648
Doi: 10.4025/actascihealthsci.v45i1.58513

Resilience and anxiety in nurses in a hospital in Iran during the COVID-19 pandemic: a cross-sectional study

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ABSTRACT. The lack of any definitive treatment or prevention of COVID-19 disease has created a lot of stress and anxiety in societies. This study aimed to evaluate the resilience and anxiety of COVID-19 in nurses of Imam Khomeini Hospital in Jiroft and their relationship with demographic variables from April to August 2020. The present study is descriptive-analytical and cross-sectional. To select the statistical sample, the census method was used so that 80 nurses working in different wards of the hospital were selected and included in the study. The resilience measurement tool is the Connor-Davidson Resilience Questionnaire (CD-RIS). COVID-19 anxiety was assessed using a comprehensive national questionnaire. Data were analyzed using descriptive and analytical statistics Chi-square, Independent two-sample parametric t-test, and ANOVA through SPSS 20. The level of COVID-19 anxiety in nurses was moderate (19.3±11.64) and the rate of resilience was low (36.7±16.65). There is a statistically significant difference between resilience in nurses and age ($p = 0.003$). There was no statistically significant relationship between the rate of resilience in nurses and gender ($p = 0.13$), the unit of service ($p = 0.87$), marital status ($p = 0.98$), work experience ($p = 0.06$), and the level of education ($p = 0.63$). There was no statistically significant relationship between anxiety in nurses and age ($p = 0.53$), gender ($p = 0.59$), the unit of work ($p = 0.48$), marital status ($p = 0.90$), work experience ($p = 0.40$), and level of education ($p = 0.60$). The results of multivariate analysis showed that, work experience, and place of work have a statistically significant relationship with resilience and anxiety of COVID-19 in nurses, respectively ($p < 0.05$).The level of COVID-19 anxiety in nurses is moderate and the rate of resilience is high. Given the current high-risk situation, it is important to identify nurses prone to psychological disorders to maintain and improve their mental health with appropriate strategies and techniques.

Keywords: resilience; anxiety; COVID-19; nurses; demographic variables.

Received on April 5, 2021.
Accepted on May 2, 2022.

Introduction

In December 2019, a viral outbreak was reported in Wuhan, China. The cause of this disease was a new and genetically modified virus of the coronavirus family called SARS-COV-2, which was named COVID-19 disease (Jo et al., 2021). Unfortunately, due to its very high infectivity, the virus spread rapidly throughout the world and infected almost all countries in a short time (less than four months) (Jose, Dhandapani, & Cyriac, 2020).

Given the pandemic status of COVID-19 disease, which affects almost all important economic, political, social, and even military aspects of all countries in the world, it is important to discuss the psychological effects of this viral disease on the mental health of people at different levels of society (Yusefi et al., 2021a). Due to the pathogenicity of the virus, the rate of spread as well as the resulting mortality rate, the disease may affect the mental health status of people at different levels of society, including patients, health care workers, families, children, students, mentally ill patients and even staff to different occupations in different ways (Ou et al., 2021). Therefore, in the current high-risk situation, identifying people prone to psychological disorders at different levels of society whose mental health may be endangered is necessary to maintain the mental health of these people with appropriate psychological strategies and techniques.

Given that health care workers are at the forefront of the combat against infectious diseases and COVID-19 disease, they are the first to be exposed to the virus. On the other hand, health care workers should wear

heavy protective clothing and an N95 mask, which restricts movement and makes it difficult to perform medical procedures and procedures compared to normal conditions. All of these factors, as well as the risk of becoming infected and infecting others, increase the risk of psychological disorders among medical staff (Afshari, Nourollahi-Darabad, & Chinisaz, 2021).

A cross-sectional study of medical staff in China during the release of COVID-19 from February 10 to February 20, 2020, shows that out of 512 staff, about 164 (32.03%) had direct contact with an infected patient with COVID-19. Among these, the prevalence of anxiety was about 12.5%, of which 10.35% experienced mild anxiety, 1.36% moderate anxiety, and about 0.78% severe anxiety (Afshari et al., 2021). Also, studies have shown that personnel who are in direct contact with patients infected with COVID-19 have a higher anxiety index than those who are not in direct contact with these patients. Also, the rate of anxiety in medical personnel of infected cities (such as Wuhan) is higher than medical personnel in other cities. Another study of physicians and nurses in Wuhan, China, during the onset of COVID-19 showed that medical staff experience a high degree of depressive symptoms (50.4%), anxiety (44.6%), insomnia (34%), and pain (71.5%) (Roberts et al., 2021).

Another factor affecting mental health is resilience, which is the capacity to recover from persistent difficulty and the ability to repair oneself. Resilience means that one can maintain the consistency and health of one's psychology in the face of adversity. In addition to resilience to the harms of threatening events, it is the active and effective participation of the individual in the environment resilience includes the ability of the individual to establish bio-psychological balance in the face of threatening events (Amini, 2013). Secondary stress has been reported in many important occupations, including nursing, and may cause nurses to leave their jobs (Jafar Jalal, Mohammadi, Seyyed Fatemi, & Haghani, 2019). Prolonged stress exposure has been reported to be associated with decreased production of the brain neurotrophic factor. This condition causes sensitivity to the symptoms of anxiety and depression (Kim, Quiban, Sloan, & Montejano, 2021). Despite all these challenges, resilience enables nurses to cope with their work environment as well as maintain healthy and sustained mental function. High resilience among health professionals leads to reduced burnout. In nursing research, the term often refers specifically to the professional challenges that nurses experience and is seen as a personal capacity that enables nurses to manage the demands of the workplace (Ang et al., 2018). Nurses need to skillfully develop resilience to cope with professional problems and ensure their mental health because resilience and resilient behaviors potentially help people overcome negative experiences, and these experiences turn into positive experiences. Given the stressful nature of nursing, resilience is an important factor as a nurse characteristic for success in the profession (Alameddine, Clinton, Bou-Karroum, Richa, & Doumit, 2021).

Due to high incidence and mortality rate, COVID-19 can lead to many psychological problems such as health worker anxiety. Following staff anxiety, the quality of service can also be affected and disrupt the process of providing services to patients. Human resources are a key element of the health system in providing services and their problems and mental disorders and difficult conditions of service in these critical and stressful conditions can cause them to leave the service and leave the job, which Imposes a lot of costs to the health system. Numerous studies have been conducted in different parts of the world to determine the level of mental disorders and resilience of health workers during the COVID-19 pandemic, which in itself indicates the importance of addressing this fundamental issue. Because nurses' levels of anxiety can vary from place to place, it is important to understand the current health status of COVID-19 care front-line staff for possible remedial action.

Therefore, this study aimed to evaluate the resilience and anxiety of COVID-19 in nurses of Imam Khomeini Hospital in Jiroft and their relationship with demographic variables from April to August 2020.

Material and methods

The present study is descriptive-analytical and cross-sectional. The statistical population of this study includes nurses of a hospital in Jiroft (Southeast Iran) in the first five months of 2020 (from April to August). To select a statistical sample, the census sampling method was used, so that by referring to different wards of the hospital, resilience and anxiety questionnaires were given to nurses. To collect data, the objectives of the research were first explained to the individuals, and if they wished to participate in the study and obtain informed consent, the demographic information form and related questionnaires were filled out. When filling out the questionnaire, the researcher monitored how it was completed and answered people's questions. Then

the forms and questionnaires were collected and subjected to statistical analysis. Inclusion criteria include all nurses working in the hospital and exclusion criteria include nurses who have a history of mental illness and the use of psychiatric drugs. The resilience measurement tool is the Connor-Davidson Resilience Questionnaire (CD-RIS), which has 25 items on a Likert scale between zero (completely false) and five (always true). The score range is between 0-100 and the higher the score, the higher the resilience. The validity and reliability of the questionnaire were measured according to the study of Mohammadi et al. (2003). Cronbach's alpha coefficient of the questionnaire was 0.97. COVID-19 anxiety was assessed using a comprehensive national questionnaire which has 18 items that are between zero (never) and three (always) on the Likert scale. The highest and lowest scores that the respondents get in this questionnaire are between 0-54. High scores in this questionnaire indicate a higher level of anxiety in individuals. Cronbach's alpha coefficient of the questionnaire was 0.919. This questionnaire has also been approved in terms of validity and reliability. Based on this questionnaire, the mean score of the anxiety of psychological symptoms (5-0, 19-6, 27-20); physical symptoms (1-0, 9-2, 27-10), and the whole questionnaire (16-0, 29-17, 54-30) show mild, moderate, and severe anxiety, respectively (Luceño-Moreno, Talavera-Velasco, García-Albuerne, & Martín-García, 2020). Finally, the obtained data were analyzed using SPSS software version 20. First, statistical indicators related to descriptive statistics such as mean, standard deviation, frequency, and frequency percentage were calculated, then the Kolmogorov-Smirnov statistical test was used to check the normality of the data. Independent two-sample parametric t-test, analysis of variance, and Chi-square test were used. Finally, the independent variables obtained from univariate analysis with a value of less than 0.2 were entered into multivariate linear regression analysis. Multivariate analysis was performed using the Enter method and $p<0.05$ was considered statistically significant.

The hospital where the research was conducted is the largest hospital in the south of Kerman province. It has more staff than other hospitals and is equipped with more wards. Due to the more facilities of this hospital, patients from 6 other cities will be sent to this hospital to receive more specialized and sub-specialized services in that area.

Results

The mean age of participating nurses was 36.7±13.6 (range 22-59) years. The highest frequency of nurses was in the age group of 20-30 years (65%) and the lowest frequency of nurses was in the age group over 50 years (6.2%). Most of the nurses participating in the study were male (53.8%), married (56.3%), and worked in the emergency department (45%). The highest frequency of work experience was 1 to 10 years (65%) and most of them had a bachelor's degree (95%). Table 1 shows the relationship between demographic variables and the mean score of resilience and anxiety based on univariate analysis.

Table 1. Mean resilience score and anxiety due to COVID-19 in terms of demographic variables in nurses in a hospital in Southeast Iran from April to August 2020.

Variable	Group	Frequency		Resilience score		P-value	Anxiety score		P-value
		Number	Percent	Mean	Standard deviation		Mean	Standard deviation	
Age (years)	20-30	52	65	38.6	13.2	0.003	32.1	14.2	0.53
	30-40	13	16.2	30	11.4		25.3	17.2	
	40-50	10	12.5	28.5	8.5		30.6	15.1	
	>50	5	6.2	50.8	16.7		29	17.8	
Gender	Man	43	53.8	35.4	15.1	0.13	28.4	14.9	0.59
	Woman	37	46.2	38.3	11.7		33.2	14.8	
Serving ward	Emergency unit	36	45	35.1	15	0.87	26.9	18	0.48
	Internal medicine	3	3.7	28.3	0.57		23.6	7.7	
	Pediatric	5	6.2	42.6	9.9		38.4	7.8	
	Orthopedics	12	15	37.4	14		31.9	11.5	
	Surgery	3	3.7	37.6	15		33	10.1	
	ICU	6	7.5	38.6	16.7		35.3	15.3	
	CCU	9	11.2	37.5	13		32.7	14.2	
	COVID	6	7.5	40.8	9.3		38.1	2.2	
Marital status	Single	35	43.7	38.4	13.5	0.98	33.7	15.6	0.91
	Married	45	56.3	35.5	13.7		28.2	14.2	
Work experience	<1	11	13.7	29.3	17.3	0.06	28.8	21.2	0.40
	1-10	52	65	38.3	12.3		32.6	13.8	

	10-20	11	13.7	32.2	8.7		25.7	12.6	
	20-30	6	7.5	44.8	19.5		25.6	15.2	
Level of education	Under high school diploma	1	1.2	42	-	0.63	20	-	0.60
	High school diploma	1	1.2	44	-		33	-	
	Bachelor	76	95	36.3	13.8		31	15.1	
	Master	2	2.5	51	5.6		18.5	12	

p<0.5 indicates statistically significant results.

Table 2 shows the results of multivariate analysis of the relationship between resilience and anxiety of COVID-19 in nurses with demographic variables.

Table 2. Multivariate linear regression analysis to determine the relationship between resilience and anxiety caused by COVID-19 with demographic variables in nursesin a hospital in Southeast Iran from April to August 2020.

Variable	Resilience P-value	Anxiety P-value
Age	0.065	0.784
Gender	0.218	0.089
Serving ward	0.072	0.008
Marital status	0.154	0.078
Work experience	0.009	0.893
Level of education	0.403	0.529

p <0.5 indicates statistically significant results.

Table 3 shows the mean score of anxiety in nurses. The severity of anxiety due to COVID-19 in nurses was seen in the moderate range.

Table 3. Mean score of anxiety due to COVID-19 in nurses based on anxiety questionnaire factors in a hospital in Southeast Iran from April to August 2020.

Agent	Mean	Standard deviation	Skewness	Kurtosis	P-value
Mental symptoms	11.33	5.06	0.16	0.65	
Physical symptoms	7.97	6.58	0.5	-0.43	
Total	19.3	11.64	0.3	0.1	0.001

p<0.5 indicates statistically significant results.

Among the factors of the resilience questionnaire, the highest mean was related to the factor of perception of individual competence, and the lowest mean was related to the subscale of spiritual effects. The results show that the average resilience score was high in nurses (Table 4).

Table 4. Mean score of resilience in nurses based on resilience questionnaire factors in a hospital in Southeast Iran from April to August 2020.

Agent	Mean	Standard deviation	Skewness	Kurtosis	P-value
Image of personal competence	12.3	5.22	0.02	-0.22	
Resilience to negative emotion	10.41	4.45	0.045	-0.16	
Accepting positive change and safe interactions	6.85	3.04	-0.15	-0.5	0.001
Control	4.5	2.32	0.53	0.89	
Spiritual effects	2.71	1.62	0.39	0.53	
Total	36.7	16.65	0.41	0.27	

p<0.5 indicates statistically significant results.

Discussion

The results showed that the rate of resilience among nurses was low.In a study of nurses in Japan, South Korea, the United States, and Turkey during the Covid-19 pandemic, the mean resilience for all samples was moderate. Nurses in the United States reported more resilience than nurses in other countries (Jo et al., 2021). The findings of some other studies showed moderate levels of resilience during the Covid-19 epidemic among nurses (Jose et al., 2020; Yusefi et al., 2021a; Ou et al., 2021; Afshari et al., 2021; Roberts et al., 2021), which contradicts the results of this study. Resilience is a complex and dynamic process that is not only influenced by the profession but also by various factors such as personal characteristics and environmental and social factors (Roberts et al., 2021). Also, public and organizational support and appreciation, and job satisfaction

can enhance nurses' resilience. In studies conducted before the Covid-19 pandemic in Iran, high nurses' resilience was reported (Amini, 2013; Jafar Jalal, Mohammadi, Seyyed Fatemi, & Haghani, 2019). The specific conditions of the Covid-19 pandemic may have contributed to conditions that reduce nurses' resilience. Studies have shown that with increasing resilience, mental disorders in employees decrease (Yusefi et al., 2021a; Jafar Jalal, Mohammadi, Seyyed Fatemi, & Haghani, 2019; Kim et al., 2021).

High resilience in nurses enables them to use positive adaptive skills to cope with stress and helps them stay successful in a stressful hospital environment.The highest mean resilience score is observed in the age group over 50 years. The highest mean resilience was seen in the work experience of 20-30 years and the lowest mean resilience was seen in less than 1 year of work experience.

Findings of other studies conducted during the Covid-19 pandemic, including the study of Yusefi et al. (2021a), Afshari et al. (2021), Kim et al. (2021) and Robert et al. (2021) indicate a higher resilience score in the elderly nurses and more experienced work that is consistent with the results of this study. In the study of Ang et al. (2018), older nurses with years of experience were more resilient.

Older nurses and those with more work experience appear to be more resilient and less anxious due to more experience in difficult situations and participation in multiple epidemics during service.The mean resilience of female nurses was higher than male nurses.

In the present study, although the difference between the reported resilience scores between male and female nurses was not significant, however, the reported resilience level was higher in female nurses than men.Contrary to the results of this study, in Afshari et al. (2021) study, on average, women had significantly less resilience than men during the COVID-19 epidemic. Also in the study of Alameddine et al. (2021) In Lebanon, male nurses were more resilient. Differences in study results can be attributed to different life experiences as well as cultural, personality, and psychological characteristics of the samples.

The average resilience of nurses based on the place of work is from the highest to the lowest average equal to the pediatric ward, COVID-19, ICU, surgery, CCU, orthopedics, emergency, and internal medicine.Because the pediatric, Covid-19, and ECU wards are stressful environments, high resilience can help nurses in these wards cope with their anxiety and job stress. Due to the sensitivity of the work in these wards, nurses may be hired in these wards who are more resilient. Perhaps the special conditions of these wards have not been ineffective in increasing the resilience of nurses.

Although the difference between the reported resilience scores between single and married nurses was not significant, the level of resilience reported was higher in single nurses. In Afshari et al.'s study, childless nurses had higher resilience during the Covid-19 pandemic (Afshari et al., 2021).

Living with a family and worrying about transmitting the disease to other family members may have been factors in reducing resilience in the medical staff who are married and have children. Contrary to the results of the present study, married nurses were more resilient in the study of Stig et al. Conducted in Singapore prior to Pond May Covid-19 (Ang et al., 2018). Married nurses, who are afraid ofinfecting family members, maybe more vigilant and therefore feel more resilient despite the risk of spreading the disease. Receiving more support from spouses and friends may contribute to higher resilience.

Although the difference between resilience and anxiety scores among nurses or different levels of education was not significant, however, the level of resilience reported in nurses with master's degrees was higher than that of bachelor and the level of anxiety in nurses with bachelor's degree was higher than master's degree.

In a study conducted during the Covid-19 pandemic in Spain, mental disorders were lower in higher education groups than in other educational groups (Luceño-Moreno et al., 2020). In the study of Yousefi et al. (2021b) mental disorders were more common among the staff of Covid-19 treatment hospital who were less educated. In Afshari et al.'s study, which was conducted during the Covid-19 pandemic, nurses' resilience scores increased with increasing education level (Afshari et al., 2021). In their study, Ang et al., (2018) showed that having a higher education degree has an effect on increasing resilience (Ang et al., 2018). In the study of Alameddine et al. (2021) in Lebanon, nurses with a master's degree were more resilient.

Lack of knowledge and skills in employees with lower education may increase anxiety at work and be less resilient. It seems that higher education, job status, and appropriate social status can be effective in increasing people's resilience and reducing mental disorders. Employees with higher education and income feel more secure in life, so they may be less prone to mental disorders and have greater resilience.

Although nurses are often psychologically trained, experienced, and experienced in dealing with illness and death (Billings, Ching, Gkofa, Greene, & Bloomfield, 2021), various studies around the during the Covid-19 pandemic have reported mental disorders including the prevalence of stress and anxiety that has increased

among health workers, especially nurses (Al Maqbali, Al Sinani, & Al-Lenjawi, 2021; Lai, 2020; Xiang, 2020; Zhang et al., 2020). In the study by Roberts et al. (2021), Nearly 21% of nurses experienced moderate to severe anxiety symptoms during the Covid-19 pandemic. It seems that the stressful and exhausting nature of the job, the risk of infection, insufficient understanding of this emerging patient, lack of sufficient knowledge of prevention and control, and high and long-term workload are some of the reasons for nurses' mental disorders during the Covid-19 crisis.

In the present study, although the difference between the reported anxiety scores among nurses with different age groups was not significant, however, the reported anxiety levels were higher in nurses aged 20 to 30 years. In a study by Zheng et al. (2021) in China, young Covid-19 frontline nurses reported more mental disorders. In a study by Sim et al. in Singapore (Sim, Chong, Chan, & Soon, 2004) and Su et al. (2007) in Taiwan, the incidence of mental disorders and PTSD was higher during the SARS epidemic in younger health care workers. Younger nurses are likely to show more anxiety due to less experience and skills during epidemics. Experienced and older nurses are better able to cope with harsh working conditions and stress and are more adaptable to change.

Contrary to the results of the present study in the study of Li et al. (2020), Conducted in Wuhan, China, in the early Covid-19 pandemic, older nurses had higher levels of anxiety than younger nurses. Older nurses, most of whom are married, or who may have underlying illnesses, may be more stressed because of fear of contracting the coronavirus or transmitting the disease to other spouses and children.

In the present study, although the difference between the reported anxiety scores between male and female nurses was not significant, however, the level of anxiety reported was higher in female nurses.The results of a study by Dai, Hu, Xiong, Qiu, and Yuan (2020) during the Covid-19 epidemic in China showed that female employees had higher levels of anxiety. In the study by Zheng et al. (2021) in China, female frontline nurses were more anxious and more concerned about their own health or that of their families. In the study of Pouralizadeh et al. (2020) in Gilan during the Covid-19 pandemic, female nurses were more anxious and depressed than male nurses. According to the results of Simonetti et al. (2021) sleep disorders and anxiety. In the study by Li et al. (2020), conducted in Wuhan, China, anxiety scores were significantly higher in women than in men. Women may be more likely to be anxious because of responsibilities other than job responsibilities and managing multiple roles simultaneously.

In a study conducted in Wuhan, China, 77.3% of front-line nurses fighting Covid-19 were anxious. The longer the clinical hours spent fighting Covid-19, the higher the level of anxiety (Li et al., 2020).The study by Kim et al. (2021),showed that nurses working in Covid-19 wards suffered more from mental health problems and disorders than other hospital staff. In the study of Pouralizadeh et al. (2020) in Gilan, nurses working in the Covid-19 reference hospital had more anxiety and depression. In a systematic review and meta-analysis, the prevalence of anxiety was higher among front-line nurses (Al Maqbali et al., 2021). Nurses may experience unpleasant feelings when caring for people who are seriously ill, especially if the patient is a child. Which causes anxiety and stress in them. Nurses also have their own concerns about viral infections and health risks to their family members that can become a psychological burden for them.

Having work stress and poor quality of family relationships due to the need to maintain social distance may be high risk factors for anxiety and other mental disorders in nurses working in infectious wards.

In the present study, although the difference between the reported anxiety scores between single and married nurses was not significant, however, the level of anxiety reported was higher in single nurses that is consistent with the study of Yousefi et al. (2021b), Mental disorders were higher in single employees. Because single nurses are often younger, less experienced, and less experienced, they may have fewer skills, so they may be more anxious when faced with an outbreak of emerging diseases. Social isolation during the Covid-19 pandemic may also have had a greater impact on single people living alone.

In contrast to the present study, married nurses in Wuhan, China, had higher levels of anxiety than single nurses (Li et al., 2020). In the study by Sim et al. the family may have been more anxious about married nurses at the beginning of the Covid-19 pandemic.

Conclusion

According to the research findings, nurses' resilience was low and their anxiety was moderate. It seems that predisposing factors in the epidemic of a new disease, such as lack of comprehensive understanding of how to prevent and control it, fear of infecting themselves and family members, are associated with an

increase in mental disorders in nurses. Therefore, planning is necessary to improve the mental health of employees at the forefront of disease treatment.

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