Received: 24 Sep 2022 | **Accepted:** 20 Dec 2022
DOI: 10.54005/geneltip.1179740

ORIGINAL ARTICLE

Determination of Anxiety and Resilience in Nurses During COVID-19: A Correlational Study

COVID-19 Sürecinde Hemşirelerin Anksiyete ve Psikolojik Sağlamlık Durumlarının Belirlenmesi: Korelasyonel Bir Çalışma

[1]Tuba Özaydın, [1]Raziye Çelen, [2]Pınar Zorba Bahçeli

[1]Selçuk Üniversitesi, Hemşirelik Fakültesi
[2]Bakırçay Üniversitesi, Sağlık Bilimleri Fakültesi

Correspondence

Tuba Özaydın, Selçuk Üniversitesi, Hemşirelik Fakültesi, Konya, Türkiye, 42250

E-Mail: tuba_demirel_70@hotmail.com

How to cite ?

Özaydın T. , Çelen R. , Zorba Bahçeli P. Determination of Anxiety and Resilience in Nurses During COVID-19: A Correlational Study. Genel Tıp Dergisi. 2022; 32(6): 761-767.

ABSTRACT

Objective: The study aimed to determine the levels of anxiety and resilience of nurses working during the COVID-19 pandemic.
Materials and Methods: This study was descriptive and cross-sectional design. The study sample consisted of 401 nurses. Study data was collected by researchers through an online survey form. A personal information form, the Beck Anxiety Inventory, and the Brief Resilience Scale were used to collect data.
Results: The anxiety mean scores were 19.08±13.23 and the resilience mean scores were 8.87±4.46 for the nurses. It was determined that the nurses being female, lack of protective equipment for COVID-19, caring for COVID-19 patients and low psychological resilience were the factors that predicted the level of anxiety (p<0.05).
Conclusions: The study proves that the levels of anxiety and resilience in nurses working during the pandemic are negatively affected.

Keywords: Anxiety, COVID-19, Nurse, Resilience

ÖZ

Amaç: Çalışma, COVID-19 pandemisi sürecinde çalışan hemşirelerin anksiyete ve psikolojik sağlamlık durumlarının belirlenmesini amaçlamıştır.
Gereç ve Yöntem: Bu çalışma tanımlayıcı ve kesitsel tasarımdadır. Çalışma örneklemini 401 hemşire oluşturdu. Çalışma verileri, araştırmacılar tarafından Surveey form aracılığıyla ile online anket ile toplandı. Verilerin toplanmasında Kişisel Bilgi Formu, Beck Anksiyete Ölçeği ve Kısa Psikolojik Sağlamlık Ölçeği kullanıldı.
Bulgular: Hemşirelerin anksiyete puan ortalamaları 19.08±13.23 ve psikolojik sağlamlık puan ortalamaları 8.87±4.46'dir. Hemşirelerin kadın olması, COVID-19 için koruyucu ekipman eksikliği olması, COVID-19 hastalarına bakım verme ve psikolojik sağlamlığın düşük olması anksiyete düzeyini yordayan faktörler olduğu belirlendi (p<0.05).
Sonuç: Bu çalışma pandemi sürecinde çalışan hemşirelerin anksiyete ve psikolojik sağlamlık düzeylerinin olumsuz yönde etkilendiğini göstermektedir.

Anahtar Kelimeler: Anksiyete, COVID-19, Hemşire, Psikolojik Sağlamlık

Introduction

An epidemic impacting a continent or the whole world is defined as a pandemic. According to the World Health Organization (WHO), for an outbreak to be defined as a pandemic, it must be a new communicable disease that can be transmitted easily and continuously from human to human (1). We still encounter new viruses and diseases associated with them in this century. One of the most important such diseases is the novel coronavirus disease 2019 (COVID-19) (2).

In the world, COVID-19 cases reached over 496 million, while deaths reached almost 6 million by April 2022. In Turkey, over 15 million people were diagnosed with this disease and 98 thousand of them have died (3). Elderly people, people with chronic diseases, pregnant

women, and healthcare workers are at a higher risk of contracting this disease (2).

After the pandemic was identified, the number of patients increased rapidly, and the disease was also observed among healthcare workers (4). Special attention and effort to protect against this disease are especially emphasized in the group of healthcare workers (5). Preparing for outbreaks and producing fast solutions in emergency situations are important for controlling the outbreak, protecting the healthcare workers working on the frontline, and improving patient outcomes (6).

Pandemic diseases that kill many people have negatively affected the psychology of individuals in society (7). Faced with such a large-scale infectious public health event, healthcare workers feel both physical and psychological pressure. It is noted that nurses working during the COVID-19 pandemic in China experienced irritability, reluctance to rest, and some psychological symptoms, but denied these symptoms and rejected offers for help. The nurses did not initially feel anxious about fighting against this pandemic; however, the fear of infecting their families, lack of knowledge regarding the approach and care of patients who need to be quarantined, shortage of protective equipment, and the feeling of inability to care for critical patients have become sources of anxiety. It is emphasized that providing the necessary mental support would be effective in reducing these symptoms. Maintaining the mental health of healthcare workers is imperative and necessary to better control infectious diseases (8, 9). The fact that nurses care for patients diagnosed with COVID-19 they are in constant physical contact with the patient in intensive care units; moreover, hospital environments are risky, the spread of the disease is extremely rapid across continents, and the fear of encountering undiagnosed cases, poor progression of prognosis, and being in the potential risk group because they are healthcare workers. With this study, it is thought to reveal the effects of the difficult working conditions on the anxiety and psychological resilience of nurses in Türkiye who had to cope with COVID-19. Nurses are mostly at the forefront and have to cope with the crisis period such as the pandemic. For this reason, nurses' resilience and anxiety levels are important in order to overcome this difficult process.Therefore, the study aims to determine the levels of anxiety and resilience of nurses working during the COVID-19 pandemic.

Questions of the research

What is the level of anxiety of nurses working during the COVID-19 pandemic?

What is the level of resilience of nurses working during the COVID-19 pandemic?

What are the factors that determine the levels of anxiety and resilience of nurses?

Materials and Methods

Study design

This was a descriptive and cross-sectional study to determine the levels of anxiety and resilience of the nurses working during the COVID-19 pandemic.

Participants

The population of the study consisted of nurses actively working in family healthcare centers and hospitals during the COVID-19 pandemic in Türkiye. There are estimated 150.000 nurses currently on active duty across Türkiye (10). The samples of the study was calculated to be 384 nurses, assuming a 0.5 variability with a margin error of 5% at a confidence level of 95% according to the formula to calculate the sample size for a finite population (Z = 1.96) (11). Within the scope of the research, 401 people were reached. Data were collected online on a voluntary basis. Since those who wanted to continue the survey participated, there was no data loss.

The inclusion criteria were as follows: (i) 18 years and older (ii) active during the COVID-19 pandemic, and (iii) volunteered to participate in the study. The exclusion criteria were as follows: (i) having any diagnosis of psychiatric illness and (ii) refusing to participate in the research.

Data collection

The data of the study were collected during May 22–29, 2020, using the online survey link created by the researchers on the "surveey.com" URL and sent to nurses and nurses' groups via social media accounts (WhatsApp). To collect data, a personal information form was used together with Beck Anxiety Inventory and Brief Resilience Scale.

The Personal Information Form was created by the researchers in line with the literature. The form consists of 15 questions regarding the socio-demographic characteristics of the nurses and their knowledge about COVID-19.

Beck Anxiety Inventory was developed by Beck (1988) to distinguish anxiety from depression. The inventory consists of 21 items that question the severity of anxiety symptoms as well as subjective anxiety and bodily symptoms. The inventory using the self-evaluation method is a zero-to-three point Likert-type scale, and the score range is 0–63. A higher total score indicates a high severity of the anxiety experienced (12). The study of validity-reliability of the scale for Türkiye was conducted by Ulusoy (1998) and Cronbach's alpha coefficient was calculated as 0.93. In this study, Cronbach's alpha coefficient was found as 0.94.

Brief Resilience Scale was developed by Smith (2008) and is a five-point Likert-type self-reporting measuring instrument consisting of six items. Items 2, 4, and 6

on the scale are encoded backward. A high score after reverse-coded items are calculated indicates a high level of resilience (14). The validity-reliability study for Türkiye was conducted by Doğan (2015) and Cronbach's alpha coefficient was determined as 0.83. In this study, Cronbach's alpha coefficient was 0.81.

Data analysis

Statistical analyses were performed using the Statistical Package for the Social Sciences, Version 22.0, for Windows (IBM Corp., Armonk, NY, USA). Descriptive statistics were used for including frequency, percentage, mean, and standard deviation. The Kolmogorov-Smirnov normality test was applied to the scale scores for further analyses. One-way analysis of variance (ANOVA) and independent-sample t-test were used to evaluate the difference between the characteristics of the nurses and scale scores. Multiple linear regression analysis (backward method) was performed to determine the impact of variables. All dichotomous variables were recoded as dummy variables (exp. 0 or 1). $p < 0.05$ was considered to be significant.

Ethical considerations

The study was approved by the Clinical Research Ethics Committee of the Bakırcay University in Turkey (decision no: 2020/24) and performed by the Helsinki Declaration. The participants first read the voluntary informed consent text in the link sent online. After getting acquainted with the study, they answered the question "Would you like to participate voluntarily in the study?" with a Yes or No. After that, the volunteers filled out the questionnaire. They were informed that they could withdraw from the study at any time without stating a reason.

Results

Sample Characteristics

Demographics and study characteristics of the nurses are shown in Table 1. In terms of demographic characteristics, the mean age of the nurses is 30 years (SD = 6.07). Most nurses (89%) are female, more than half (54.9%) are married and do not have children (55.4%), most (72.6%) are university graduates, and most (71.1%) of their incomes are equal to their expenses. As regards study characteristics, their mean duration of experience in nursing is 7.66 years (SD = 6.21), average weekly working hours are 48.91 hours (SD = 21.62), and 48.6% of them work in a university hospital. Nurses comprising 35.7% stated that they have protective equipment in the unit where they work, 29.7% of them stated that they had provided care for a patient who was diagnosed with COVID-19, while 5.7% of them said that they had a relative who is diagnosed with COVID-19, 22.2% of them specified that they did not receive any training regarding protection against COVID-19, and 15% of them indicated that they did not know the precautions to take when caring for COVID-19 patients (Table1).

The anxiety and resilience mean scores of nurses are 19.08 (SD = 13.23) and 18.87 (SD = 4.46), respectively. There is a statistically significant difference between the anxiety mean scores of nurses according to the variables of gender, marital status, number of children, economic status, possession of protective equipment, providing care for a patient diagnosed with COVID-19, and knowing the precautions for be taken when providing care for these patients ($p<0.05$). There is a statistically significant difference between the resilience mean scores of nurses according to the variables of gender, marital status, number of children, possession of protective equipment, providing care for a patient diagnosed with COVID-19, and knowing the precautions to be taken when providing care for these patients ($p<0.05$; Table 2).

Multiple Regression Analysis of Predictors for Anxiety and Resilience in Nurses

The multiple regression analysis was performed to examine the factors affecting the levels of anxiety and resilience in nurses (Table 3, Table 4). When the determining factors affecting the levels of anxiety in nurses were examined, being female ($\beta = 0.09$), the lack of protective equipment ($\beta = 0.10$), and caring for patients with COVID-19 ($\beta = 0.20$) had a positive impact on improving the levels of anxiety; resilience ($\beta = -0.37$) was seen to have a negative impact on the level of anxiety. Nurses' age, years of experience, weekly working hours, marital status, economic status, and knowing the precautions to be taken while caring for COVID-19 patients were not found meaningful in this model. The determining factors were found effective in explaining 24% of the change in the level of anxiety ($R^2 = 0.24$) (Table 3).

Among the determining factors affecting resilience, caring for patients with COVID-19 ($\beta = 0.16$) had a positive impact on improving the resilience of nurses. The level of anxiety ($\beta = -0.38$) had a negative impact on the resilience of nurses. The determining factors were found effective in explaining 21% of the change in the level of resilience (R2 = 0.21). Other factors shown in the table were not found meaningful in this model (Table 4).

Table 1. Demographics and study characteristics of the nurses (n= 401).

Variables	N (%) or mean (SD)
Mean age, years	30 (6.07)
20-29	224 (55.9)
30-39	133 (33.1)
40-48	44 (11.0)
Sex	
Female	357 (89.0)
Male	44 (11.0)
Marital status	
Married	220 (54.9)
Single, widowed or divorced	181 (45.1)
Number of children	
No	222 (55.4)
1	86 (21.4)
2	75 (18.7)
3 and over	18 (4.5)
Education status	
High school	29 (7.2)
Associate's degree	33 (8.2)
University	291 (72.6)
Postgraduate	48 (12.0)
Economic status	
Income is less than their expenses	63 (15.7)
Income is equal to their expenses	285 (71.1)
Income is more than their expenses	53 (13.2)
Study unit	
Family Health Center	30 (7.5)
State Hospital	158 (39.4)
Private Hospital	18 (4.5)
University Hospital	195 (48.6)
Years of experience	7.66 (6.21)
Weekly working, hours	48.91 (21.62)
Possession of protective equipment	
Yes	143 (35.7)
No	258 (64.3)
Providing care for a patient diagnosed with COVID-19	
Yes	119 (29.7)
No	282 (70.3)
Possession of relatives diagnosed with COVID-19	
Yes	23 (5.7)
No	378 (94.3)
Having received training about protection against COVID-19	
Yes	312 (77.8)
No	89 (22.2)
Knowing the precautions to be taken when providing care for a patient diagnosed with COVID-19	
Yes	341 (85.0)
No	60 (15.0)

Data are shown as mean (SD) for continuous data or n (%) for categorical data.

Table 2. Beck Anxiety Inventory and Brief Resilience Scale mean scores according to nurses' demographic and Covid-19 characteristics (n= 401).

Characteristics	Beck anxiety Inventory Mean (SD)	Test	p	Brief Resilience Scale Mean (SD)	Test	p
Age						
20-29	18.06 (11.94)			18.98 (4.51)		
30-39	19.57 (13.69)	F=2.559	0.079	18.73 (4.45)	F=0.175	0.839
40-48	22.84 (17.10)			18.68 (4.32)		
Sex						
Female	19.69 (13.28)	t=2.613	***0.009***	18.67 (4.38)	t=-2.486	***0.013***
Male	14.20 (11.85)			20.43 (4.84)		
Marital status						
Married	20.61 (13.90)	t=2.562	***0.011***	18.44 (4.52)	t=-2.111	***0.035***
Single, widowed or divorced	17.23 (12.14)			19.38 (4.34)		
Number of children						
No	17.65 (12.17)			19.23 (4.37)		
1	23.59 (14.48)*	F=4.509	***0.004***	17.45 (4.70)*	F=3.801	***0.010***
2	18.69 (13.56)			19.39 (4.34)		
3 and over	16.83 (14.32)			18.89 (3.79)		
Education status						
High school	17.52 (10.26)			17.24 (4.70)		
Associate's degree	20.52 (15.94)	F=0.310	0.818	18.64 (5.52)	F=1.467	0.223
University	19.19 (13.23)			19.02 (4.23)		
Master Degree	18.42 (13.04)			19.08 (4.83)		
Economic status						
Income is less than their expenses	23.60 (15.40)*			18.08 (4.89)		
Income is equal to their expenses	18.87 (12.62)	F=6.611	***0.001***	18.99 (4.23)	F=1.185	0.307
Income is more than their expenses	14.85 (12.22)			19.13 (5.10)		
Study unit						
Family Health Center	17.30 (16.09)			19.33 (4.25)		
State Hospital	18.35 (12.40)			18.95 (4.61)		
Private Hospital	15.00 (10.28)	F=1.495	0.215	19.89 (5.77)	F=0.623	0.600
University Hospital	20.33 (13.58)			18.63 (4.24)		
Possession of protective equipment						
Yes	16.38 (11.93)	t=-3.076	***0.002***	19.48 (4.54)	t=2.048	***0.041***
No	20.58 (13.69)			18.53 (4.38)		
Providing care for a patient diagnosed with COVID-19						
Yes	21.71 (13.23)	t=2.605	***0.010***	19.81 (4.58)	t=2.769	***0.006***
No	17.98 (13.09)			18.47 (4.35)		
Possession of relatives diagnosed with COVID-19						
Yes	21.87 (13.87)	t=1.040	0.299	20.35 (4.21)	t=1.646	0.101
No	18.92 (13.19)			18.76 (4.46)		
Having received training about protection against COVID-19						
Yes	18.62 (12.54)	t=-1.182	0.239	19.06 (4.58)	t=1.675	0.095
No	20.72 (15. 37)			18.17 (3.96)		
Knowing the precautions to be taken when providing care for a patient diagnosed with COVID-19						
Yes	18.52 (12.69)	t=-1.750	***0.043***	19.16 (4.42)	t=3.205	***0.001***
No	22.27 (15.69)			17.18 (4.34)		

*Post hoc test (Tukey HSD)

Table 3. Multiple regression analysis of predictors for nurses' anxiety (n=401).

	B	SE	β	t	p
Constant	27.85	6.98		3.989	0.001**
Age	0.02	0.23	0.01	0.08	0.93
Years of experience	0.17	0.23	0.08	0.73	0.46
Weekly working hours	0.04	0.03	0.06	1.28	0.20
Sex (Female)	3.76	1.90	0.09	1.98	**0.04***
Marital status (Married)	1.44	1.33	0.05	1.08	0.28
Economic status (Income is less than their expenses)	2.83	1.64	0.08	1.72	0.08
The lack of protective equipment	2.83	1.24	0.10	2.27	**0.02***
Caring for patients with COVID-19	5.65	1.33	0.20	4.25	**0.001****
Not knowing the precautions to be taken while caring for COVID-19	2.34	1.69	0.06	1.38	0.17
Brief Resilience Scale	-1.102	0.14	-0.37	-8.07	**0.001**a**
R= .49 R^2 = .24 F=12.29 p <.001					

*p< .05, **p< .001

Table 4. Multiple regression analysis of predictors for the resilience of nurses (n= 401).

	B	SE	β	t	p
Constant	18.75	1.35		14.924	**0.001***
Single, widowed or divorced	0.19	0.48	0.02	0.39	0.69
Having protective equipment	0.39	0.43	0.04	0.91	0.36
Caring for patients with COVID-19	1.59	0.46	0.16	3.49	**0.001***
Trained for protection against COVID-19	0.20	0.53	0.02	0.38	0.70
Knowing the precautions to be taken while caring for COVID-19	0.97	0.63	0.08	1.55	0.12
Beck Anxiety Inventory	-0.13	0.02	-0.38	-7.96	**0.001***

*p< .001

Discussion

This study was conducted to determine the anxiety and resilience of nurses working during the pandemic; It is seen that being a woman, not having protective equipment, and caring for a patient with COVID-19 are factors that increase the anxiety of nurses. The level of resilience also has a negative effect. Moreover; while caring for patients with covid-19 affects the resilience levels of nurses positively, high anxiety scores affect them negatively.

The level of anxiety was significantly higher in female, married nurses with a child, whose income is less than their expenses, while the level of resilience was lower. Other studies determined that there were significant increases in psychological problems such as anxiety in male healthcare workers during the epidemic (16, 17). However, in some studies, there was no significant difference between mental issues and levels of resilience based on gender (9, 18). Other studies demonstrated that outbreaks affect the anxiety and resilience of males and females at different levels (9, 16,17, 18). The lower resilience and higher anxiety levels of women in this study may be due to the higher number of female nurses working in clinics. In addition, it can be attributed to the fact that women have a more fragile structure by nature, there are obscurity about the treatment process of the pandemic and they have not taken part in this type of epidemic before.

In this study, single nurses had high resilience, while married nurses with a child had higher levels of anxiety. In the outbreaks of influenza A (H1N1) and the Middle East respiratory syndrome coronavirus, nurses stated that they carried risks both for themselves and their families, and that they were mostly concerned about infecting their families (19-21). There was no significant correlation between the psychological states and the marital status of the nurses and healthcare workers in China during the COVID-19 outbreak (9). Studies show that the levels of anxiety, concern, and stress in married individuals are more adversely affected during such pandemics (9, 19, 20, 21). It is believed that this is caused by health workers' fear of infecting their spouses and children.

This study determined that the levels of anxiety in nurses increased with age. In a study that examined the levels of anxiety and depression in healthcare workers working during the COVID-19 pandemic unit and other units in China, the depression scores of the healthcare workers under 30 years of age were found higher than the others (22). However, according to another study, it was determined that age did not affect the resilience of healthcare workers during the pandemic (9). Other studies in the literature indicated that age affects the levels of anxiety and psychological state at different levels. It is believed that age-related anxiety increases due to reasons such as the long years of professional experience and the number of patients per nurse in Türkiye.

It was determined the levels of anxiety were high and the levels of resilience were low in nurses who did not have protective equipment, who provided care for patients with COVID-19, and who did not know the precautions to be taken when providing care to these patients during the pandemic. In nurses who did not receive any training about protection against COVID-19, the level of resilience was found to decrease. In other disease outbreaks in the literature, nurses who were informed about the disease and provided with sufficient personal protective equipment were able to protect themselves from the disease whereas they stated that they were physically and mentally

impacted otherwise (19, 23). Compared to some psychosocial characteristics of the healthcare workers who did not have direct contact with Ebola patients, it was determined that those in close contact with patients experienced more social isolation (17). During the H1N1 influenza pandemic, there was a correlation between the perceived adequacy of information of healthcare workers about the pandemic and their levels of anxiety about the pandemic (21). In a systematic review, factors such as receiving training about the pandemic disease, working in a high-risk environment, being in quarantine, and perceived risk negatively impacted the psychological state of healthcare workers (24). Other studies also show that the lack of protective equipment during disease outbreaks, working in risky areas where diagnosed patients are treated, and the lack of information about the disease adversely affect the psychological state of healthcare workers.

This study determined that the nurses' levels of anxiety increased with their years of experience and weekly working hours. In studies with nurses involved in H1N1 influenza and Ebola epidemics, nurses stated that working hours should be reduced during such outbreaks. It is emphasized that long working hours negatively affect the mental states of nurses (17, 25, 26). Increased anxiety levels of nurses are believed to be caused by longer working hours and the difficulty of working with protective equipment along with the new tasks and responsibilities expected from them during such outbreaks.

In this study, the anxiety and resilience levels of nurses affected each other negatively. The literature reported that disease outbreaks could cause several psychiatric morbidities, including persistent depression, anxiety, panic attacks, and even suicide in healthcare workers (27-29). Healthcare workers who did not work in the pandemic units were also reported to have high levels of anxiety and depression (22). The levels of depression, anxiety, insomnia, and stress significantly increased in parallel with the severity of mental disorders in nurses and healthcare workers during the COVID-19 outbreak in China (9). During outbreaks, healthcare workers working in hospitals or in the field to provide clinical treatment or prevent the transmission of the disease carry a risk of infecting themselves; this can cause stress, anxiety, and psychological problems in healthcare workers (30). These issues can persist post the pandemic; therefore, it is recommended to carry out efforts to strengthen the psychological defense systems of healthcare workers (9, 31). Studies support that levels of stress, anxiety, and psychological issues increase during pandemics, and this negatively affects healthcare workers.

Study limitations

There are some limitations to be considered for the present study. First, only nurses working in Türkiye during the pandemic participated in this study. Therefore, the results from the present study cannot be generalized to other nurses. Second, data collection forms were completed online, and we did not have the chance to control the data collection process. Finally, the long-term psychological effects of a pandemic on nurses have not been studied.

Conclusion

In conclusion, in the present study, the anxiety and resilience levels of nurses affect each other negatively. In line with these results, it is recommended that nurses should be provided with adequate protective equipment during pandemics and with detailed in-service training about providing healthcare to patients with COVID-19, their working hours in the clinic should be shortened, and nurses in risk groups should be directed to psychological support units for the development of coping strategies, anxiety and resilience and experimental studies aimed at strengthening effective coping strategies for nurses should be conducted.

Funding:

There is no financial support.

Conflict of interest:

The authors do not have any conflict of interest

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