

# The relationship between anxiety levels and anger expression styles of nurses during COVID-19 pandemic

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## Abstract

**Objective:** This study was carried out in a cross-sectional and correlational design to explore the relationship between anxiety levels and anger expression styles of nurses during the COVID-19 pandemic.

**Methods:** The sample of this cross-sectional and correlational type of study consisted of 618 nurses calculated with the snowball sampling method. The data were collected using a questionnaire developed by the researchers, the state anxiety inventory, and the trait anger and anger expression scale and was conducted between May 10 and 20, 2020 using an online questionnaire form. Percentage, mean, standard deviation, the Mann-Whitney *U* test, Kruskal-Wallis test, Spearman correlation analysis, and multiple linear regression analysis were used to evaluate the data.

**Results:** The mean age of nurses was  $34.98 \pm 8.36$  years (min: 20; max: 53), 87.4% were women, and 81.7% experienced a high level of anxiety. The anger scores of the participants were found to be  $20.04 \pm 4.43$ , the anger-in score was  $15.55 \pm 3.34$ , the anger-out score was  $14.01 \pm 2.87$ , and the anger control score was  $22.93 \pm 3.6$ . Being married, the presence of chronic disease, living in the Marmara region, working shifts, presence of an individual over 65 years of age at home, and having a COVID-19 test were found to be risk factors that significantly increase nurses' anxieties. A significant positive relationship was found between the anxiety scores, trait anger ( $r = 0.249, p = 0.000$ ), anger-in ( $r = 0.174, p = 0.000$ ) and anger-out ( $r = 0.205, p = 0.000$ ) scores of nurses, and a significant negative relationship was found between the anxiety scores and anger control ( $r = 0.249, p = 0.000$ ) score.

**Conclusion:** The study revealed that in the COVID-19 pandemic the anxiety levels of the nurses were high and that the high anxiety level negatively affected the style of anger expression, but the nurses were successful in maintaining anger control. In line with these results, it is important that nurses develop effective coping strategies to reduce their anxiety levels and that they receive increased levels of support in managing anger expression.

## KEYWORDS

anger, anxiety, COVID-19, nurse

## 1 | INTRODUCTION

Coronavirus disease 2019 (COVID-19), which belongs to the same group of viruses that cause severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome, emerged in Wuhan, the capital of China's Hubei province on December 19, 2019. It was first called novel coronavirus 2019-nCoV and then SARS-CoV-2.<sup>1,2</sup>

The novel COVID-19 virus is an RNA virus from the coronavirus family infecting animals and humans, causing respiratory, gastrointestinal, hepatic, and neurological diseases.<sup>3</sup> The disease spread rapidly to other parts of China and countries all around the world. The World Health Organization (WHO) declared it a pandemic on January 30, 2020.<sup>2</sup> In the declaration by the WHO on March 21, 2020, it was reported that there were more than 283,000 cases and that more than 11,561 people died.<sup>4,5</sup>

Following the first case of COVID-19 disease was seen in Wuhan's Huanan seafood wholesale market, the main source of transmission was thought to be from animals to humans. However, subsequent cases showed that there was no exposure to this market. Therefore, it was concluded that the virus is transmitted from one person to another, and symptomatic individuals are the main source of COVID-19 transmission.<sup>6</sup>

The COVID-19 clinical picture can range from unspecified clinical symptoms to severe respiratory failure and death. Among the common symptoms are fever, cough, muscle pain, fatigue, headache, diarrhea, and hemoptysis.<sup>7</sup>

Current epidemiological research indicates that the incubation period of the disease lasts 1–14 days (mostly 3–7 days) and is contagious during this period.<sup>8</sup>

In the publication by Huang et al. ( $n = 41$ ), one of the first reports about the disease, fever, weakness, dry cough, and shortness of breath were indicated as the symptoms of COVID-19. Chest computed tomography scans were performed in all cases, and pneumonia and abnormal findings were diagnosed. The intensive care unit clinical picture of COVID-19 (intensive care unit) ranges from sepsis, septic shock, and multiorgan failure to systemic symptoms, characterized by respiratory failure requiring mechanical ventilation and support. Approximately one-third of the cases (32%) needed intensive care, and 15% of them died.<sup>1</sup>

During pandemics, health institutions are among the institutions working under the most challenging conditions. In pandemics that affect society socioeconomically and spiritually, the mental health of healthcare workers with a large social and work responsibility are affected by this situation. In the first study on health workers in Wuhan, where the COVID-19 epidemic first appeared, immediately after the epidemic, 71.3%, 22.4%, and 6.2% of healthcare workers were reported to have sub-threshold/mild, moderate, and severe mental disturbances, respectively.<sup>9</sup>

While providing care for individuals with COVID-19, nurses which make up the majority of healthcare workers, have been found to have symptoms such as anxiety, anger, irritability, insomnia, and headaches.<sup>10</sup>

Hazaleus and Deffenbacher examined the relationship between anger and anxiety disorders (1986), and they suggested that as the

level of anger decreases, anxiety symptoms decrease, and in this case, anxiety may be one of the consequences of anger.<sup>11</sup> Fava et al.<sup>12</sup> also emphasized that most people who had tantrums also had higher levels of anxiety.<sup>13</sup>

There are studies in the literature exploring the relationship between anger and anxiety with various variables. For example, one study examined the relationship between anger and anxiety in children of divorced and non-divorced families and revealed that children whose parents divorced displayed more anger and aggression reactions.<sup>14</sup> In another study, the relationship between perfectionism, depression, anxiety, stress for success in adolescents and social stress and anger were evaluated and perfectionism towards self was found to be largely related to depression and anxiety, while perfectionism towards social order was found to be largely associated with depression, anxiety, social stress, suppressed anger, and anger-out.<sup>15</sup>

Dealing with anxiety and anger is not the suppression or hiding of these feeling, but the recognition of them. Biological and physiological structure, logical and irrational beliefs, the environment in which they live, their relationship with environmental factors such as culture and family structure play an important role in the individuals' recognition of their anxiety and anger. When individuals recognize situations that they perceive as problematic, such as anxiety and anger, they can use these emotions for themselves in a constructive way.<sup>16,17</sup>

In short, the concepts of anxiety and anger can trigger each other and may appear from time to time in the literature. However, no studies have evaluated the relationship between anxiety and anger expression in nurses.

This study aimed to explore the relationship between nurses' anxiety levels and anger expression styles during the COVID-19 pandemic. Through the data obtained, which variables nurses were affected during the pandemic and how their anxiety levels were reflected in their anger expression styles were evaluated. The results of the study will contribute to taking protective, preventive, and maintaining measures necessary for nurses to cope with anxiety and anger and to the literature.

Based on this knowledge, our study was conducted to explore the relationship between nurses' anxiety levels and anger expression styles during the COVID-19 pandemic.

## 2 | METHODS

### 2.1 | Type of the study

This study was carried out in a cross-sectional and correlational design.

### 2.2 | Population-sample

The data of the study were collected between May 10 and 20, 2020. The population of the study consists of nurses working in health

institutions in Turkey. The sample includes 618 nurses who voluntarily agreed to participate in the study and worked in health institutions determined by the snowball sampling method.

### 2.3 | Inclusion and exclusion criteria

Nurses who volunteered to participate in the study and worked actively in health institutions during the pandemic process were included, and healthcare workers other than nurses and nurses and who did not work in health institutions actively during the pandemic were excluded from the study.

### 2.4 | Data collection tools and data collection

The data were collected using the state anxiety inventory (SAI), and the trait anger and anger expression scale (TAAES), and nurse descriptive information form created by the researchers. After obtaining the necessary consent for the study, an online survey form was created electronically using the Google Forms web application. The forms were sent through the WhatsApp messenger program to the nurses' smartphones in Turkey. The study was completed with 618 nurses who agreed to participate in the research.

**Nurse descriptive information form:** Prepared by the researchers, the form includes 16 questions covering the descriptive features of nurses and their experience of caring for patients during the COVID-19 pandemic in Turkey.

**The SAI:** It consists of 20 items and identifies the state anxieties including the anxiety the individual is currently experiencing. The Turkish reliability and validity study was performed by Nesrin Öner.<sup>18</sup> The state anxiety Chronbach alpha coefficient was found between 0.94 and 0.96. The scores obtained on the state anxiety scale vary between 20 and 80 points. In the evaluation of the scale, scores under 36 indicate no anxiety, scores between 37 and 42 indicate mild anxiety, and scores 43 and above indicate high anxiety level.<sup>19</sup> In our study, Cronbach's alpha was found as 0.84. Cronbach's alpha reliability coefficient is widely used to determine the reliability of scales. Cronbach's alpha coefficient in the range of  $0.8 \leq \alpha < 1.00$  is considered as high reliability.<sup>20</sup> In our study, the SAI scale appears to be of high reliability.

**The TAAES:** Developed by Spielberger in 1983, it is a self-rating scale measuring the sense of anger and expression. Its Turkish adaptation was made by Ozer.<sup>21</sup> The first 10 items measure the level of trait anger, and 24 items determine the anger styles (anger-in, anger-out, and anger-control sub-dimensions) of individuals. High scores obtained from trait anger indicate that anger level is high, high scores on the anger-in scale mean that anger is suppressed and held inside. High scores on the anger-out scale indicate that anger is easily expressed, and high scores on the anger-control scale indicate that anger can be controlled. The Cronbach alpha coefficients were found to be 0.79 for the "trait anger" dimension, 0.78 for the "anger-out dimension," 0.62 for the "anger-in" dimension, and 0.84 for the "anger

control" dimension.<sup>21</sup> The Cronbach alpha coefficients of the scale for this study were 0.81 for the "trait anger" dimension, 0.72 for the "anger-out" dimension, 0.70 for the "anger in" dimension, and 0.82 for the "anger control" dimension. The TAAES scale was found to be highly reliable in our study.

### 2.5 | Evaluation of the data

The data were analyzed using the Statistical Package for Social Sciences (SPSS) 22.0 package program. In the evaluation of the data, the Kolmogorov–Smirnov distribution test was used to examine the normal distribution as well as descriptive statistical methods such as frequency, percentage, mean, median (25–75 percentile), and standard deviation. Mann–Whitney *U* test and Kruskal–Wallis test were used to compare variables that did not show normal distribution between the groups. The Spearman correlation analysis was used to look at the relationship between numerical variables. Multiple regression analysis was used to determine the effect of independent variables on scale scores.

### 2.6 | Ethical aspect of the research

For this study, permission numbered 2020/5 was obtained by the Gümüşhane University Scientific Research and Publication Ethics Committee of the relevant university, and informed consent was received from the nurses in line with the principle of volunteering. This study was carried out in accordance with the Declaration of Helsinki Principles.

### 2.7 | Limitations of the research

The findings obtained in the study are limited to the nurses working in Turkey, so it cannot be generalized to the nurses in all countries due to administrative and cultural differences.

## 3 | RESULTS

The study showed that the mean age of the nurses was  $34.98 \pm 8.36$  years (min: 20; max: 53), and 87.4% were women. 63.8% of the nurses were married, 61.7% had children, 70.6% were university graduates, 80.1% had no chronic diseases, 93.5% worked in a public hospital, 71.7% had night shifts, and 80.6% were working in a region outside the Marmara Region. Besides, the average working experience of nurses was  $13.95 \pm 9.00$  years (min: 0; max: 45), and they worked on average  $44.03 \pm 9.97$  h (min: 20; max: 96 h) weekly. 65.2% of the nurses lived with their family during the pandemic, 87.2% did not live with an individual over the age of 65 at home, 54.4% did not have somebody diagnosed with COVID-19 around them, 64.6% provided care to the patient with COVID-19, and 72.2% did not have a COVID-19 test.

**TABLE 1** Nurses' state anxiety inventory and TAAES sub-dimensions mean scores ( $n = 618$ )

Inventory	<i>n</i> (%)	Mean $\pm$ SD	Median (min-max)
State anxiety inventory		50.52 $\pm$ 9.52	49.00 (33-80)
Normal	17(2.8)	35.00 $\pm$ 0.86	35.00 (33-36)
Mild	102(16.5)	40.15 $\pm$ 1.66	40.00 (37-42)
High	499(80.7)	53.17 $\pm$ 8.63	51.00 (43-80)
TAAES sub-dimensions			
Trait anger		20.04 $\pm$ 4.43	20.00 (10-40)
Anger- in		15.55 $\pm$ 3.34	16.00 (8-32)
Anger- out		14.01 $\pm$ 2.87	14.00 (8-32)
Anger control		22.93 $\pm$ 3.61	23.00 (12-32)

Abbreviation: TAAES, trait anger and anger expression scale.

The anxiety scores of the nurses were found to be  $50.52 \pm 9.52$ , and the vast majority (80.7%) had high anxiety levels. The trait anger score of the nurses was  $20.04 \pm 4.43$ , the anger-in score was  $15.55 \pm 3.34$ , the anger-out score was  $14.01 \pm 2.87$ , and the anger control score was  $22.93 \pm 3.6$  (Table 1).

Table 2 shows the mean scores of the nurses on the SAI and the TAAES sub-dimensions according to some descriptive characteristics. The mean scores of nurses were compared by gender, and anxiety scores of female nurses were found to be significantly higher than males ( $p < 0.001$ ), and there was no significant difference between the SPSS sub-scores ( $p > 0.05$ ). No significant relationship was detected between marital status and anger-in, and anger control

sub-dimensions. Married nurses' anxiety score ( $p = 0.002$ ), trait anger ( $p = 0.010$ ), anger-out ( $p = 0.009$ ) scores were significantly higher than singles. The anxiety ( $p = 0.011$ ) and anger-out scores ( $p = 0.042$ ) of the nurses with children were significantly higher than the other nurses, and there was no significant difference between trait anger, anger-in, and anger control scores. The trait anger ( $p = 0.021$ ) and anger out ( $p = 0.014$ ) scores of nurses with chronic disease were found to be significantly high (Table 2). There was not a significant difference between the education, work styles, the region they lived, their working experience, the weekly working hours, age, and anxiety levels, and anger scores ( $p > 0.05$ ).

In our study, the anger control scores ( $p = 0.018$ ) of the nurses who had night shifts and the anxiety scores ( $p = 0.002$ ) of the nurses who lived separately from their families during the pandemic were found to be significantly higher than other nurses. The anxiety score, trait anger, and anger-out scores of the nurses who had the COVID-9 test and who had somebody diagnosed with COVID-19 around them were found to be significantly higher than the others ( $p < 0.05$ ). Besides, it was found that the anxiety levels of nurses increased with the increase in weekly working hours and the relationship between them was statistically significant ( $r = 0.124$ ;  $p = 0.002$ ) (Table 3).

There was a statistically significant positive difference between the nurses' SAI and trait anger ( $r = 0.249$ ,  $p < 0.001$ ), anger-in ( $r = .174$ ,  $p < 0.001$ ), and anger-out ( $r = 0.205$ ,  $p < 0.001$ ) scores. A negative significant correlation was found between the SAI and anger control ( $r = 0.249$ ,  $p < 0.001$ ) (Table 4).

According to the results of multiple linear regression analysis, factors that significantly affected nurses' anxiety scores were found to be being married, having a chronic disease, living in the Marmara

**TABLE 2** Distribution of SAI and TAAES sub-dimensions scores according to some descriptive characteristics of nurses ( $n = 618$ )

Characteristics	<i>N</i> (%)	SAI median (25-75) percentile	Trait anger median (25-75) percentile	Anger-in median (25-75) percentile	Anger-out median (25-75) percentile	Anger control median (25-75) percentile
Gender						
Female	540 (87.4)	49.5 (44-56)	20.0 (17-22)	16.0 (13-18)	14.0 (12-16)	23.0 (21-25)
Male	78 (12.6)	45.0 (41-51)	19.0 (16-22)	15.5 (13-17)	14.0 (12-16)	24.0 (20-26)
		$p < 0.001^a$	$p = 0.189$	$p = 0.790$	$p = 0.637$	$p = 0.459$
Marital status						
Single	224 (36.2)	47.0 (43-54)	19.0 (16-22)	15.0 (13-17)	13.5 (11-15)	23.0 (20-25)
Married	394 (63.8)	50.0 (44-56)	20.0 (17-23)	16.0 (14-18)	14.0 (12-16)	23.0 (21-25)
		$p = 0.002^a$	$p = 0.010^a$	$p = 0.106$	$p = 0.009^a$	$p = 0.718$
Having children						
Yes	381 (61.7)	50.0 (44-56)	20.0 (17-22)	15.0 (13-18)	14.0 (12-16)	23.0 (21-25)
No	237 (38.3)	48.0 (43-54)	19.0 (17-22)	16.0 (13-18)	14.0 (12-15)	23.0 (20-25)
		$p = 0.011^a$	$p = 0.291$	$p = 0.871$	$p = 0.042^a$	$p = 0.161$
Chronic disease <sup>b</sup>						
Yes	123 (19.9)	49.0 (44-58)	20.0 (18-23)	16.0 (13-18)	15.0 (13-16)	23.0 (20-24)
No	495 (80.1)	49.0 (44-55)	19.0 (17-22)	15.0 (13-18)	14.0 (12-16)	23.0 (21-25)
		$p = 0.338$	$p = 0.021^a$	$p = 0.676$	$p = 0.014^a$	$p = 0.147$

Abbreviations: SAI, state anxiety inventory; TAAES, trait anger and anger expression scale.

<sup>a</sup>Mann-Whitney *U* test.

<sup>b</sup>Chronic disease: diabetes, hypertension, cardiac diseases, respiratory tract diseases.

**TABLE 3** Distribution of SAI and TAAES sub-dimensions scores according to the characteristics of the nurses regarding the COVID-19 process (n = 618)

Characteristic	n (%)	SAI median (25-75) percentile	Trait anger median (25-75) percentile	Anger-in median (25-75) percentile	Anger-out median (25-75) percentile	Anger-control median (25-75) percentile
<b>Working style</b>						
Night shift	443 (71.7)	49.0 (44-56)	20.0 (17-23)	14.0 (16-18)	14.0 (12-16)	23.0 (20-05)
Day shift	175 (28.3)	48.0 (43-54)	19.0 (17-22)	15.0 (13-17)	14.0 (12-16)	24.0 (22-26)
		<i>p</i> = 0.107	<i>p</i> = 0.146	<i>p</i> = 0.209	<i>p</i> = 0.493	<i>p</i> = 0.018 <sup>a</sup>
<b>People they live with</b>						
Family	403 (65.2)	49.0 (44-55)	20.0 (17-22)	16.0 (13-18)	14.0 (12-16)	23.0 (21-25)
Separated from the family due to the pandemic	99 (16.0)	51.0 (45-60)	20.0 (17-23)	15.0 (14-18)	14.0 (12-16)	23.0 (0-26)
Alone	116 (18.8)	47.0 (42-52)	19.0 (17-22)	15.0 (13-17)	14.0 (11-15)	23.0 (20-25)
		<i>p</i> = 0.002 <sup>b</sup>	<i>p</i> = 0.142	<i>p</i> = 0.457	<i>p</i> = 0.223	<i>p</i> = 0.644
<b>Presence a person diagnosed with COVID-19 around you</b>						
Yes	282(48.6)	51.0 (45-57)	20.0 (17-23)	16.0 (14-18)	14.5 (12-16)	23.0 (21-25)
No	336(54.4)	48.0 (43-54)	19.0 (17-22)	15.0 (13-18)	14.0 (12-15)	23.5 (21-25)
		<i>p</i> < 0.001 <sup>a</sup>	<i>p</i> = 0.045 <sup>a</sup>	<i>p</i> = 0.137	<i>p</i> = 0.002 <sup>a</sup>	<i>p</i> = 0.239
<b>Having COVID-19 test</b>						
Yes	153 (24.8)	51.0 (46-58)	20.0 (18-23)	15.0 (13-17)	14.0 (12-16)	22.0 (20-25)
No	465 (75.2)	48.0 (43-55)	19.0 (17-22)	16.0 (13-18)	14.0 (12-16)	24.0 (21-25)
		<i>p</i> < 0.001 <sup>a</sup>	<i>p</i> = 0.040 <sup>a</sup>	<i>p</i> = 0.474	<i>p</i> = 0.035 <sup>a</sup>	<i>p</i> = 0.117
<b>Weekly working hours</b>						
		<i>r</i> = 0.124	<i>r</i> = 0.058	<i>r</i> = 0.008	<i>r</i> = 0.023	<i>r</i> = -0.020
	<i>p</i> = 0.002 <sup>c</sup>	<i>p</i> = 0.150	<i>p</i> = 0.839	<i>p</i> = 0.571	<i>p</i> = 0.615	

Abbreviations: COVID-19; coronavirus disease 2019; SAI, state anxiety inventory; TAAES, trait anger and anger expression scale.

<sup>a</sup>Mann-Whitney U test.

<sup>b</sup>Kruskal-Wallis test.

<sup>c</sup>Spearman correlation analysis.

Scale	Trait anger <i>r</i> value	Anger-in <i>r</i> value	Anger-out <i>r</i> value	Anger control <i>r</i> value
State anxiety inventory	0.249*	0.174*	0.205*	-0.102*
TAAES sub-dimensions				
Anger-trait	1	0.382*	0.590*	-0.446*
Anger-in		1	0.257*	-0.196*
Anger-out			1	-0.414*
Anger-control				1

Note: *r* = Spearman correlation coefficient.

Abbreviation: TAAES, trait anger and anger expression scale.

\**p* < 0.001.

region, having night shifts, having someone over 65 years old at home, and having COVID-19 test (Table 5).

## 4 | DISCUSSION

This study explored the relationship between nurses' anxiety levels and anger expression styles during the COVID-19 pandemic. Results showed that 87.4% of the nurses in the study were women, 63.8% were married, 61.7% had children, 71.7% worked shifts, 19.9% had a chronic illness, and 70.6% were university graduates. In addition, the mean age of the nurses was  $34.98 \pm 8.36$ , the average working experience was  $13.95 \pm 9.0$ , and the weekly working hours were  $44.03 \pm 9.97$ .

The state anxiety score of the nurses was determined as  $50.52 \pm 9.52$ . Because a scale score of 43 and above indicates a high anxiety level, the state anxiety levels of the nurses were considered as high. According to the TAAES, the trait anger score of the nurses

was  $20.04 \pm 4.43$ , the anger-in score was  $15.55 \pm 3.34$ , the anger-out score was  $14.01 \pm 2.87$ , and the anger control score was  $22.93 \pm 3.6$ .

In terms of gender, it was determined that the state anxiety scores of female nurses were significantly higher than male nurses ( $p < 0.001$ ), but there was no significant difference in terms of the TAAES and sub-dimensions ( $p > 0.05$ ). In a study with healthcare workers exposed to COVID-19, Lai et al.<sup>22</sup> highlighted that being a woman was associated with high anxiety and depression. Of service providers in the health sector in Turkey, women constitute about 70%. In addition to the increased workload of women working in the field of health during the epidemic, the prolongation of the time spent by the household at home due to reasons like economic restrictions and lockdown has also increased the burden of women. The fact that our country mostly has a patriarchal social structure and the effort of women to fulfill many roles both at home and in the workplace during the day can be associated with the high level of anxiety of women. To prevent the negative effects of the social crisis on women, it is recommended to collect gender-based data and to make planning in this way.

It was determined that there was no significant relationship between marital status and anger-in, and anger control sub-dimensions, state anxiety score, trait anger, and anger-out scores of married nurses were significantly higher than those of single nurses. A study reported that married nurses experienced more burnout than single nurses,<sup>23</sup> while in another study, married nurses who worked night shifts had impaired sleep, and they could not sleep enough after shifts.<sup>24</sup> The fact that married nurses have more roles and responsibilities than single ones and that they do not allocate enough time for themselves due to their efforts to fulfill the requirements of their spouse and motherhood roles may be associated with their high anger expressions. In addition, married nurses are required to stay in a different location apart from their home during the pandemic so as not to be in close contact with their family members, which may in turn lead to increased anxiety and difficulty in controlling anger. Therefore, that married nurses' anger-out scores were higher than single nurses was an expected outcome.

In our study, the state anxiety score and anger-out scores of the nurses with children were significantly higher than the others, but no significant difference was found between trait anger, anger-in, and

**TABLE 5** Results of multiple linear regression analysis of variables that affect the state anxiety scores of nurses

Model	<i>B</i>	<i>SE</i>	<i>B</i>	<i>t</i>	<i>P</i>
Constant	41.53	1.85		22.42	<0.000
Marital status	2.82	1.00	0.15	2.81	0.005
Presence of a chronic disease	3.38	1.28	0.14	2.62	0.009
The region nurses live in	2.41	1.00	0.12	2.41	0.016
Working style	2.30	1.05	0.12	2.17	0.031
Presence of an individual over 65 at home	3.00	1.52	0.10	1.97	0.049
Having COVID-19 test	4.01	1.14	0.18	3.50	0.001

Note: Model *R* = 0.332; *R*<sup>2</sup> = 0.110; Adjusted *R*<sup>2</sup> = 0.094; *F* = 6.74; *p* < 0.01. Dependent variable: state anxiety inventory. Dependent variables: marital status (0: Single 1: married), presence of a chronic disease (0: no; 1: yes), the region nurses live in (1: other regions; 2: Marmara region), working style (0: dayshift; 1: night shift), presence of an individual over 65 at home (0: no; 1: yes), having COVID-19 test (0: no; 1: yes). Abbreviation: COVID-19, coronavirus disease 2019.

anger control scores. The uncertainty caused by the COVID-19 pandemic in the country and the world, the closure of schools, the lockdown of children, the fear of infecting their children, not being able to allocate enough time for their children are thought to be the reasons for the nurses to be unable to provide anger control and to express their anger.

Chronic diseases are one of the main stressors that change the adaptation capacity of individuals and can cause changes in body image, lifestyle, role changes, developing new habits, the inclusion of the disease in the life, and changes in the quality of life.<sup>25,26</sup> In this study, trait anger and anger-out scores of nurses with chronic disease were found significantly higher. The trait anger and anger-out rates of nurses were expected to be high because the COVID-19 pandemic disrupts lifestyle and leads to role changes in individuals with chronic disease, and the pandemic poses risks and stressors associated with it.

Anger control refers to situations and individual reactions that determine the extent to which a person controls his/her anger in relationships with others or to what extent s/he can calm down.<sup>27</sup> The anger control scores of the night shift nurses in our study were found to be significantly higher. Unlike our study, relevant research noted that the anger control sub-dimension mean scores of the nurses working continuously at night were significantly lower.<sup>28</sup> The nursing profession is the only health discipline that provides uninterrupted service to individuals in need of healthcare. Despite the busy work schedule, their professional philosophies and values, a holistic and humanistic perspective, and the meticulous teaching of communication and anger concepts in undergraduate education are believed to help nurses achieve better anger control.

In our study, the anxiety levels of nurses with higher weekly working hours were found to be significantly higher. In the literature, it is reported that the workload of nurses is generally high, based on their long working hours. During the COVID-19 pandemic, nurses' anxiety levels are expected to be high, especially in hospitals that are treating COVID-19 patients and where the patient census is higher than usual. Considering that nurses provide long hours of care to patients with a high risk of infection, have difficulties in eating, drinking, and going to the toilet with protective equipment, it is expected that they have high anxiety levels.

The state anxiety scores of the nurses who were required to live separately from their families during the pandemic were found to be significantly high. These nurses experienced high levels of anxiety due to not being able to fulfill their roles in the family, longing for family members, not being able to spend time with them, and being at risk of infection while performing their professional duties. In a study, it was reported that the social support levels of healthcare workers were positively correlated with self-efficacy and sleep quality and negatively correlated with anxiety and stress levels.<sup>29</sup> Accordingly, it can be thought that the anxiety and stress levels of health professionals are related to social support systems.

It was seen that the state anxiety score, trait anger, and anger out of scores the nurses who had a COVID-19 test and who had

someone diagnosed with COVID-19 around them were significantly higher than the other nurses. During the COVID-19 pandemic, the nurses with the highest risk of transmission of infection were thought to have increased anxiety levels due to uncertainties about the process, and they also had increased anxiety levels due to the fear of infecting their loved ones and losing them as a result of infection transmission.

In our study, the factors that significantly influenced nurses' anxiety scores were found to be being married, having a chronic disease, living in the Marmara region, having night shifts continuously, having a relative over 65 years old at home, and having a COVID-19 test. Unlike our study, Zengin and Gümüş found that anxiety and depressive symptoms were influenced by the level of education, smoking, work experience, professional satisfaction, and economic situation. Gender, marital status, having children, and the unit where the nurses worked had no impact on anxiety and depression.<sup>30</sup> Nurses who cared for the patient with COVID-19 were reported to have symptoms of anxiety (27.9%) and depression (43%).<sup>31</sup> In another study investigating the psychological effects of COVID-19 on health workers in Wuhan, being female, work experience of more than ten years, chronic illness, and/or mental disorder were indicated as causes of stress. Anxiety, depression, and acute stress tendencies also increased as the work experience increased, which was associated with lower professional burnout and family responsibilities of health workers who were single and had less than 2 years of work experience.<sup>32</sup>

## 5 | CONCLUSION

This study revealed that the anxiety levels of the nurses were high during the COVID-19 pandemic, and the high anxiety level negatively influenced the anger expression, but they were successful in managing anger control. Being female, being married, having children, living apart from the family due to the pandemic, having someone diagnosed with COVID-19 in the immediate environment, having the COVID-19 test, having more weekly working hours were the factors that caused nurses to experience a higher level of anxiety. Nurses who had a chronic disease, who were married, who had children, and had someone diagnosed with COVID-19 in their immediate environment experienced anger more. A positive significant relationship was seen between the anxiety level of the nurses and their trait anger, anger-in, and anger-out scores, and a negative relationship was seen between the anxiety level and anger control score. Factors that significantly increased nurses' anxiety were determined as being married, having a chronic disease, living in the Marmara region, having night shifts, having someone over 65 living at home, and having the COVID-19 test.

In line with these results, during a pandemic, it is recommended that;

- nurses should be considered as a high-risk group in terms of psychiatric symptoms such as anxiety and anger,

- nurses who are married, who have chronic diseases, who live in the Marmara region, who have night shifts, who live with individuals over 65 years of age at home, and who have taken a COVID-19 test should be considered in a risk group in terms of both coping with anxiety inefficiently and psychiatric symptoms,
- risk groups should be defined and evaluated in terms of psychiatric symptoms during a pandemic and training including self-knowledge, communication, crisis management, problem-solving skills and relaxation techniques should be planned and implemented,
- healthcare managers should create working environments that will assess, identify, and reduce nurses' anxiety levels,
- further research in which interventions are made in a wider group to reveal cultural, regional, and administrative differences with more concrete data should be planned in helping nurses working with patients during a pandemic.

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## CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

## AUTHOR CONTRIBUTIONS

Design: Nurten Gülsüm Bayrak and Sevda Uzun. Data collection and/or data processing, Source researching, article writing: Nurten Gülsüm Bayrak, Sevda Uzun, and Nurşen Kulakaç. Analysis and/or interpretation: Nurşen Kulakaç. All authors have contributed significantly to the writing of the manuscript and all authors are in agreement with its content.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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