

Comparison of anxiety levels of hospitalized COVID-19 patients, individuals under quarantine, and individuals in society

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Abstract

Purpose: This study aims to compare the anxiety levels of COVID-19 patients, individuals under quarantine, and healthy individuals in society.

Design and Methods: This cross-sectional study was conducted from May 25, 2020 to June 25, 2020 in a city located in the northwest of Turkey. The data were collected using a personal information form, the Beck Anxiety Scale, administered in face-to-face interviews, and online questionnaires. The data were analyzed using descriptive statistics, Kruskal–Wallis, Mann–Whitney *U*, and logistic regression analyses.

Findings: The anxiety level of individuals under quarantine (Median: min–max = 1: 0–55) was significantly lower statistically compared to that of the rest of the society (Median: min–max = 6: 0–63) and hospitalized COVID-19 patients (Median: min–max = 5: 0–42) ($p = 0.0001$). Female gender, being 61 years of age and older, having psychiatric and chronic illnesses, and experiencing disrupted sleep patterns were determined to be the factors associated with high levels of anxiety.

Practice Implications: This study found that society in general and hospitalized COVID-19 patients had high anxiety levels. The study results can be useful for creating training and population-based screening programs to control the anxiety of individuals under quarantine, hospitalized COVID-19 patients, and the rest of the society during the pandemic. Additionally, the finding from this study on groups at risk for anxiety will provide important data for future research on this subject and for the planning of health services offered to these groups.

KEYWORDS

anxiety, community, COVID-19, pandemic, quarantine

1 | INTRODUCTION

The coronavirus disease (COVID-19) was first identified by the Chinese health authority while it was rapidly spreading around the world.¹ Since then, the total number of cases has steadily increased throughout Turkey and the rest of the world² (Ministry of Health, 2020). Numerous governments around the world imposed different types of curfews to reduce the

rapid spread of the disease and lessen the burden of healthcare facilities. Measures were also taken to encourage individuals to remain at home and limit public contact.³ Other measures were also implemented, use of face mask, increasing social distance, prohibition of outdoor recreation,^{4,5} including 14-day mandatory quarantine for those who received treatment in the hospital and those suspected of the virus with travel history, curfews for various age groups, and special quarantine for certain cities and provinces

at high risk. Quarantine is one of the most important measures at the disposal of governments for reducing the rapid spread of the disease during epidemics.⁶

Although these measures have been proven to be effective in preventing the spread of the disease, they can have deleterious effects on the mental health of society. Prolonged time indoors, change in lifestyle, fear of infection and death, uncertainties about the end of the pandemic, and treatment methods can lead to problems in the mental health of a society.^{3,6,7} When strong emotional reactions to the pandemic are added to current risk factors of individuals (those who have a mental illness history), significant psychological problems (e.g., depressive symptoms, anxiety, anger, and loneliness) can emerge.^{3,5,6,8}

In previous pandemics and the present COVID-19 pandemic, anxiety has been observed to be a common consequent psychosocial condition.^{6,9,10} Anxiety is a chronic health issue that is expressed as constant fear and worry. Individuals with anxiety may experience physical symptoms, such as chest tightness, tachycardia, sweating, headache, feeling of emptiness in the stomach, uneasiness, disrupted sleep pattern, increased use of cigarettes, alcohol, and other substances, and weight gain or loss.¹¹

During the COVID-19 pandemic, various studies on the causes and levels of anxiety due to COVID-19 have been conducted.^{5,8}

There is a significant relationship between the physical symptoms and psychological consequences that healthcare professionals have experienced during the pandemic. In addition, the physical symptoms of healthcare professionals are similar to the symptoms of COVID-19.¹² The psychological impacts of the Covid-19 pandemic on healthcare professionals can have different levels of intensity. For example, surgeons who specialize in head and neck are more likely to have psychological problems than other surgeons.¹³ People in society experience anxiety because of the lack of knowledge, risk of infection,¹⁴ lockdown, and restrictions,¹⁵ whereas patients feel anxious because of the worsening of their health status, restrictions on their freedom, and fears of premature death.³ Patients infected with COVID-19 are negatively affected and feel anxious over numerous health-related matters. Hao et al.¹⁶ found that patients were dealing with a number of feelings, such as shock, fear, and boredom during their Covid-19 treatment. They also felt different levels of anxiety about discrimination, medical expenses, healthcare, and self-care. The same study found that patients with COVID-19 reported having "at least one physical symptom, impulsivity, and anxiety and insomnia at the moderate level" compared to psychiatric patients and healthy volunteers. The patients with COVID-19 reported higher levels of impulsivity than other study groups because they stayed in the isolation rooms for a long period, had limited social interaction, and were in a low-stimulus environment. Moreover, isolation, uncertainty in the results of physical symptoms, and infection experienced by the patients with COVID-19 might be among the reasons for having so many sleep problems.¹⁶

It has been shown that those who are most likely to experience fear, depression, and anxiety about their health are females, those living in the city, those who are friends or relatives of a COVID-19 patient, health professionals, those who have at least one chronic illness, and those who have received or are receiving psychiatric treatment.^{16,17}

The terrifying aspect of anxiety is that if it is not cured, it can become a chronic condition that affects the quality of life of the individual and lowers

their productivity.¹¹ Moreover, it can negatively affect individuals' work, family, and social life, and even lead to suicide.⁷ The anxiety levels experienced during the pandemic can vary according to the conditions in which individuals are living. For example, individuals who are hospital-bound, under quarantine, or active in society can experience different levels of anxiety.¹⁸ However, it is not known which groups experience the highest levels of anxiety. Therefore, it is important to determine the primary risk groups to understand which individuals in a society are most in need of preventive mental health services. Before addressing the negative effects of anxiety, it is necessary to determine the anxiety levels of certain groups so that the interventions aimed at treating mental health problems during the pandemic can be properly planned. This will ensure that the planning of preventive healthcare services, the development of programs aimed at improving psychological wellness and mental health, and the determination of priorities for interventions are directed at the groups experiencing the highest level of anxiety. This study aimed to compare the anxiety levels of COVID-19 patients, individuals under quarantine, and society in general.

2 | MATERIALS AND METHODS

2.1 | Study design

This study applied a descriptive and cross-sectional design.

2.2 | Study sample

This study was carried out from March 25 to June 25, 2020. The sufficiency of the sample size was evaluated based on the prepared tables recommended by the World Health Organization.¹⁹ The anxiety level of the society was accepted to be 30% by taking the average calculated from the data obtained from previous studies.²⁰ The sample size required to estimate this rate within 0.02 absolute percentage points and at a 90% confidence interval was determined to be 1421. The study was conducted with three groups. The first group included individuals with a COVID-19 diagnosis who were staying in a hospital located in a northwest province of Turkey; the second group included individuals who came to Turkey from abroad and were under a 14-day mandatory quarantine; the third group included healthy individuals who were under social isolation (individuals of society who, save for meeting essential needs, were expected to stay at home). Healthcare workers were evaluated within this group. All responses to the data collection tools were analyzed, except for those from 17 questionnaires determined to have errors, which were excluded from the study. The study was completed with 1404 participants (98.8%).

2.3 | Procedure and data collection

For the data collection process, the face-to-face interview method was used for the individuals in the first group. Patients who were being treated in the intensive care unit and did not want to participate in the study were not included. Individuals in the second group under quarantine, whose contact information was provided, were reached through social media (WhatsApp,

Facebook) within the period the study was conducted. The data for the third group, which was composed of healthy individuals of the society, were collected through online questionnaires (Google Forms). At the time of the survey, curfew rules were applied across the country. For this reason, healthy members of the society were under lockdown at the time of the survey. Those who filled out the questionnaires through social media were reached using the snowball sampling method, which involved encouraging the participants to forward the questionnaire to others.

The pilot study was carried out with 10 individuals who were randomly selected from society. The pilot study took approximately 15–20 min for each individual to complete. As there were no questions found to be incomprehensible, no changes were made to the form. The results of the pilot study were not included in the study.

2.4 | Measures

2.4.1 | Data collection tools

This study used two questionnaires, a personal information form, and the Beck Anxiety Scale (BAS).

2.4.2 | Descriptive information form

This form, developed in line with the literature, was composed of 20 questions to determine the age, gender, marital status, substance use, such as smoking and alcohol, sleep patterns, and television (TV) watching habits of the individuals.^{14,21–24} The content validity of the form was confirmed based on a 90% level of item agreement in the opinions of five specialists. The literature states that agreement levels of 80% or higher are sufficient for content validity.²⁵

2.4.3 | The Beck Anxiety Scale

This scale is a self-assessment scale that was developed by Beck et al.²⁶ to determine the frequency of anxiety symptoms. The responses given to the questions were evaluated as follows: none—0 points, mild—1 point, moderate—2 points, and serious—3 points. Higher scores obtained from the scale indicate higher anxiety levels. Scores from 0 to 7 indicate minimal level anxiety symptoms; scores from 8 to 15 indicate mild level anxiety symptoms; scores from 16 to 25 indicate moderate level anxiety symptoms; and scores from 26 to 63 indicate severe level anxiety symptoms.²⁶ The validity and reliability study of the scale was carried out by Ulusoy et al.,²⁷ who determined its internal consistency to be 0.92 and its test–retest reliability to be 0.75.²⁷ In the current study, the internal consistency coefficient of the BAS was 0.92.

2.5 | Ethical considerations

Before the study, approvals were obtained from the Ministry of Health (2020-05-07T01_31_48) from the institutions where the study was carried out, and from

the clinical research ethics committee (2020/124). Participants were informed about the study and written consent was obtained from those who agreed to participate in the face-to-face questionnaire. Individuals who participated in the social media and online questionnaires were informed with an informed consent form, and those who confirmed the “I agree to participate in the study” statement were able to access the questionnaire.

2.6 | Data analysis

Data were analyzed using the Statistical Package for the Social Sciences 23.0 software. Descriptive data, such as gender, education, and experience of violence, were evaluated according to percentage and frequency. Age, mean, and standard deviation, and scale scores were analyzed according to number, percentage, median, maximum–minimum, mean, and standard deviation. Normal distribution was evaluated based on skewness–kurtosis (values ranging from +2.5 to –2.5).²⁸ As the data were not normally distributed, the comparison analysis was carried out using Kruskal–Wallis and Mann–Whitney *U* test. Logistic regression analysis was used to determine the effect of independent variables on dependent variables. Anxiety scores were categorized in the range of low to high. A logistic regression model was developed by considering the variables determined to be significant in the univariate analysis, the literature, and the correlated variables to identify the factors affecting the anxiety scores. The sample group, gender, age, psychiatric illness, chronic illness, and sleep disorder were included in the model. To determine the differences between the groups, the Bonferroni-adjusted posthoc test was used. The results were evaluated at the 95% confidence interval and at the $p < 0.05$ significance level.

3 | RESULTS

The mean total anxiety score of the participants was 7.88 ± 0.3 . According to the groups, the mean anxiety score of the hospital patients was 8.45 ± 1.3 , that of the individuals under quarantine was 3.73 ± 0.4 , and that of the healthy individuals of society was 9.00 ± 0.3 (Table 1). The mean anxiety score of the participants under quarantine (3.73 ± 0.4) was significantly lower than that of the hospitalized COVID-19 patients (8.45 ± 1.3) and the healthy society (9.00 ± 0.3) ($H = 127.015$, $df = 2$, $p = 0.001$) (Table 1).

The mean age of the study group was 34.0 ± 11.6 years, 52.5% were male, 47.4% were married, and 48.9% were living with their partners and children. Furthermore, 43.2% of the participants had an undergraduate degree and 65.7% were employed (Table 2). Table 2 shows the participants' anxiety scores in terms of demographic characteristics. The anxiety levels were statistically significantly higher in females (8 [0–63]; $U = 136,533.000$; $Z_i = -13.944$, $p < 0.01$) and in those who were in the 18–30 years age group (6 [0–55], $H = 40.889$, $df = 2$, $p < 0.01$), who were married (5 [0–63], $U = 224,103.000$, $Z = -2.132$, $p < 0.05$), who were unemployed (5 [0–63], $U = 224,103.000$, $Z = -2.132$, $p < 0.05$), who did not smoke and use alcohol (5 [0–63], $U = 198,946.000$, $Z = -2.623$,

TABLE 1 Comparison of participants' anxiety scores ($n = 1404$)

Participants	Anxiety scores		
	n (%)	Median (min-max)	$\bar{X} \pm SD$
(1) Hospital	43 (3.1)	5 (0-42)	8.45 \pm 1.3
(2) Quarantine	283 (20.2)	1 (0-55)	3.73 \pm 0.4
(3) Society	1078 (76.8)	6 (0-63)	9.00 \pm 0.3
Total	1404	5 (0-63)	7.88 \pm 0.3
Statistics ^a	$H = 127.015$; $df = 2$, $p < 0.01$		
Post-hoc ^b	2 < 3, 2 < 1		

^aKruskal-Wallis test.

^bAdjusted Bonferroni.

$p < 0.001$), who had disturbed sleep patterns (12 [0-63], $U = 84,971.500$, $Z = -16.620$, $p < 0.01$), whose sleep duration was 0-5 h (6 [0-63], $H = 13.489$, $df = 2$, $p < 0.01$), who had a psychiatric issue (15 [0-59], $U = 24,781.000$, $Z = -7.944$, $p < 0.01$), and who had a chronic illness (7.5 [0-59], $U = 126,188.500$, $Z = -6.367$, $p < 0.01$). While the anxiety level of those who were living in a nursing home (4.5 [0-42]) was higher than those who were living alone (3 [0-37]), with their parents (6 [0-63]), or with their partner and children (4 [0-55]), the anxiety level of those living with their parents (6 [0-63]) was significantly higher statistically than those living alone ($H = 55.925$, $df = 4$, $p < 0.01$). The anxiety level of the participants who had completed primary school (2 [0-55]) was significantly lower statistically than that of the participants who had a high school (4 [0-63]), undergraduate (5 [0-59]), or postgraduate degree (6 [0-54]) ($H = 30.354$, $df = 4$, $p < 0.01$). The anxiety levels of healthcare workers (8 [0-59]) and unemployed (7 [0-63]) individuals were significantly higher statistically than those who worked as laborers (2 [0-55]) or who worked as public servants (4 [0-51]) ($H = 106.456$, $df = 3$, $p < 0.01$). The anxiety level of the participants who watched 10.1-15 h of TV per day was significantly higher statistically than that of those who watched 0-5 (5 [0-63]) and 5.1-10 (4 [0-59]) h of TV per day ($H = 10.283$, $df = 2$, $p < 0.01$). Finally, the anxiety level of the participants whose test result was negative (2 [0-21]) was lower than that of those whose test result was positive (4.5 [0-42]) or unknown (5 [0-63]) ($H = 13.011$, $df = 2$, $p < 0.01$) (Table 2).

The logistic regression analysis presented in Table 3 shows that there is a relationship between risk of anxiety and sample group, gender, age group, psychiatric and chronic illness, and disturbed sleep ($p < 0.05$). In analyzing the factors related to anxiety, it was found that the healthy society was 1.762 times more at risk of experiencing anxiety ($p < 0.01$, 95% CI = 1.179-2.633), the hospitalized COVID-19 patients, 2.334 times ($p < 0.05$, 95% CI = 1.078-5.053), females, 2.978 times ($p < 0.01$, 95% CI = 2.250-3.943), and 61 and older participants, 0.361 times ($p < 0.05$, 95% CI = 0.139-0.935). It was further observed that the participants who had a psychiatric illness were 4.168 times ($p < 0.01$, 95% CI = 2.335-7.441), those who had a chronic illness, 1.663 times ($p < 0.01$, 95% CI = 1.222-2.261), and those who had disturbed sleep, 4.397 times ($p < 0.01$, 95% CI = 3.346-5.777) more at risk of experiencing anxiety (Table 3).

TABLE 2 Participants' anxiety scores according to demographic characteristics ($n = 1404$)

Demographic	n (%)	Anxiety scores, median (min-max)
Gender		
Male	737 (52.5)	2 (0-55)
Female	667 (47.5)	8 (0-63)
Statistics, p^a	$U = 136,533.000$, $Z = -13.944$, $p < 0.01$	
Age group (34.0 \pm 11.6)		
18-30 (1)	632 (45.0)	6 (0-55)
31-60 (2)	717 (51.1)	4 (0-63)
61 and above (3)	55 (3.9)	1 (0-12)
Statistics, p^b	$H = 40.889$, $df = 2$, $p < 0.01$	
Post-hoc ^a	1 > 2 > 3	
Marital status		
Married	666 (47.4)	5 (0-63)
Single	738 (52.6)	4 (0-55)
Statistics, p^a	$U = 224103.000$, $Z = -2.132$, $p < 0.05$	
Living situation		
Alone (1)	173 (12.3)	3 (0-37)
With parents (2)	447 (31.8)	6 (0-63)
With partner-children (3)	686 (48.9)	4 (0-55)
In institution (nursing home) (4)	34 (2.4)	4.5 (0-42)
Other (5)	64 (4.6)	5 (0-59)
Statistics, p^b	$H = 55.925$, $df = 4$, $p < 0.01$	
Post-hoc ^a	4 > 1, 4 > 2, 4 > 3, 2 > 1	
Education		
Primary school (1)	133 (9.5)	2 (0-55)
High school (2)	308 (22.0)	4 (0-63)
Associate degree (3)	26 (1.9)	2.5 (0-30)
Undergraduate degree (4)	604 (43.2)	5 (0-59)
Postgraduate degree (5)	328 (23.4)	6 (0-54)
Statistics, p^b	$H = 30.354$, $df = 4$, $p < 0.01$	
Post-hoc ^a	2 > 1, 4 > 1, 5 > 1	
Employment status		
Employed	878 (65.7)	4 (0-59)
Unemployed	522 (37.2)	6 (0-63)
Statistics, p^a	$U = 199,614.000$, $Z = -3.436$, $p < 0.01$	
Occupation		
Worker (1)	270 (19.2)	2 (0-55)
Civil servant (2)	613 (43.7)	4 (0-51)
Health personnel (3)	231 (16.5)	8 (0-59)
Unemployed (4) ^c	290 (20.7)	7 (0-63)

TABLE 2 (Continued)

Demographic	n (%)	Anxiety scores, median (min–max)
Statistics, p^b	$H = 106.456$, $df = 3$, $p < 0.01$	
Post-hoc ^a	3 > 1, 4 > 1, 3 > 2, 4 > 2	
Smoking–alcohol consumption		
Yes	374 (36.6)	4 (0–59)
No	1030 (73.3)	5 (0–63)
Statistics, p^a	$U = 198,946.000$, $Z = -2.623$, $p < 0.01$	
Disruption of sleep patterns (poor sleep hygiene, waking up frequently, nightmares, difficulty falling asleep)		
Yes	400 (25.5)	12 (0–63)
No	1004 (71.5)	3 (0–55)
Statistics, p^a	$U = 84,971.500$, $Z = -16.620$, $p < 0.01$	
Sleep duration (h)		
0–5 (1)	110 (7.8)	6 (0–63)
6–8 (2)	975 (69.4)	4 (0–55)
9–13 (3)	319 (22.7)	5 (0–54)
Statistics, p^b	$H = 13.489$, $df = 2$, $p < 0.01$	
Post-hoc ^a	1 > 2	
Duration of TV watching (h)		
0–5 (1)	1256 (91.5)	5 (0–63)
5.1–10 (2)	110 (8.0)	4 (0–59)
10.1–15 (3)	6 (0.4)	26 (5–45)
Statistics, p^b	$H = 10.283$, $df = 2$, $p < 0.01$	
Post-hoc ^a	3 > 1, 3 > 2	
Psychiatric illness		
Yes	80 (5.7)	15 (0–59)
No	1324 (94.3)	4 (0–63)
Statistics, p^a	$U = 24781.000$, $Z = -7.944$, $p < 0.01$	
Chronic illness		
Yes	309 (22.0)	7.5 (0–59)
No	1095 (98.9)	4 (0–63)
Statistics, p^a	$U = 126,188.500$, $Z = -6.367$, $p < 0.01$	
COVID-19 test result		
Not known (1)	1305 (92.9)	5 (0–63)
Positive (2)	46 (3.3)	4.5 (0–42)
Negative (3)	52 (3.7)	2 (0–21)
Statistics, p^b	$H = 13.011$, $df = 2$, $p < 0.01$	
Post-hoc ^a	1 > 2, 3 > 2	

^aMann–Whitney U .^bKruskal–Wallis test.^cIncludes those who took paid and unpaid leave and who were unemployed.

4 | DISCUSSION

This study was carried out to compare the anxiety levels of individuals hospitalized with a COVID-19 diagnosis, individuals who were under quarantine because they came from abroad, and healthy individuals living in the society. It was found that the healthy individuals and hospitalized COVID-19 patients had mild levels of anxiety. However, this level was higher than that of the individuals who were under quarantine. Being female, being 61 years of age and older, having a psychiatric or chronic illness, and having a disrupted regular sleep pattern were determined to be the factors associated with high levels of anxiety.

In similar previously experienced epidemics (SARS, H1N1, etc.), it was determined that societies experienced high levels of anxiety,^{9,10} and the fear of being affected by the COVID-19 pandemic was shown to increase levels of depression, anxiety, and stress in societies.^{3,5,8,14,29} During these previous epidemics, societies faced psychological vulnerability related to uncertainty, concerns and anxiety about health.³⁰ Studies have reported that hospitalized COVID-19 patients experienced anxiety (37.72%) and depression (28.47%) symptoms and that patients who had lower social support had more anxiety ($r = -0.196$, $p < 0.05$) and depression ($r = -0.360$, $p < 0.05$) symptoms.³ Ozdin and Bayrak Ozdin¹⁷ found in their study on the Covid-19 pandemic in Turkish society that the society had a relatively high anxiety level (45.1%).¹⁷ Unlike other relevant studies, this study determined that hospitalized Covid-19 patients (Odds = 2.334, $p < 0.05$, 95% CI = 1.078–5.053) and the healthy individuals of society (Odds = 1.762, $p < 0.001$, 95% CI = 1.179–2.633) had mild levels of anxiety, whereas individuals under quarantine had low anxiety about the COVID-19 pandemic. The mild and low levels of anxiety in this study might be attributed to the measures taken during the COVID-19 pandemic, the daily evaluations carried out by the Ministry of Health, the relatively lower number of intensive care patients and deaths compared to that of other countries, and the relative success of intensive care/inpatient treatment. It is believed that monitoring and providing information to individuals who came from abroad and were placed under quarantine might have helped them to feel safer.

This study found that the anxiety levels of the hospitalized COVID-19 patients and of healthy individuals of society were higher than those of individuals under quarantine, whereas the anxiety level of the participants whose test results were unknown or negative was higher than that of the participants whose test results were positive. The epidemic that emerged earlier this year continues to be a nightmare for countries and their people as the end of 2020 approaches. Concerns over when life will return to normal and uncertainties about vaccines and treatments have an emotional effect on society. In this study, fear of being infected with COVID-19, uncertainties about the disease process, social isolation, and concerns over an unpredictable future were shown to cause the anxiety levels of individuals in society to increase.^{30,31} The fact that society was under lockdown during the data collection process can explain their higher levels of anxiety than those in quarantine. The low anxiety levels seen in the individuals under quarantine could be attributed to the hope they have of returning back to their homes and jobs. In the case of the healthy individuals of society and those who were hospitalized, the pandemic process has produced a sense of uncertainty, which likely was responsible for increasing their anxiety level. For the participants, whose test results were

TABLE 3 Logistic regression model showing factors associated with anxiety ($n = 1387$)

Variable	β	SE	Wald	df	p^* Value	Odds	95% CI for Exp(B)	
							Lower	Upper
Sample group								
Quarantine (ref)			8.776	2	<0.05			
Society	0.567	0.205	7.640	1	<0.01	1.762	1.179	2.633
Hospital	0.848	0.394	4.627	1	<0.05	2.334	1.078	5.053
Gender								
Male (ref)								
Female	1.091	0.143	58.153	1	<0.01	2.978	2.250	3.943
Age (years)								
18–30 (ref)			4.895	2	>0.05			
31–60	−0.140	0.132	1.112	1	>0.05	0.870	0.617	1.27
61 and older	−1.019	0.486	4.401	1	<0.05	0.361	0.139	0.935
Psychiatric illness								
Yes	1.427	0.296	23.302	1	<0.01	4.168	2.335	7.441
No (ref)								
Chronic illness								
Yes	0.508	0.157	10.492	1	<0.01	1.663	1.222	2.261
No (ref)								
Disturbed sleep								
Yes	1.481	0.139	112.977	1	<0.01	4.397	3.346	5.777
No (ref)								
Constant	−1.070	0.224	22.828	1	<0.01	0.343		

Note: Binary logistic regression analysis. $\chi^2 = 370.975$, $df = 8$, $*p = 0.05, 0.01$, Nagelkerke $R^2 = 0.321$.

Abbreviations: Ref, reference; SE, standard error; β , beta coefficient.

unknown or negative, the fear of being infected with COVID-19 and the apprehension about the period afterward might have been responsible for increasing their anxiety levels. On the other hand, the lower anxiety levels seen in the individuals whose test results were positive could be attributed to their loss of fear of infection.

This study found that those who had both chronic (Odds = 1.663, $p < 0.001$, 95% CI = 1.222–2.261) and psychiatric (Odds = 4.168, $p < 0.01$, 95% CI = 2.335–7.441) illnesses were in the high-risk group for anxiety. Other studies have shown that individuals who have a chronic illness, who use alcohol and tobacco, and the elderly are at higher risk of infection and death than other individuals.^{17,32} The warnings issued stating that those who have chronic illnesses have a higher risk of severe illness and death due to COVID-19 and the various study results on this subject³³ have caused individuals with chronic illnesses to experience anxiety.¹⁷ A number of factors may have contributed to increasing the anxiety levels of these individuals, including the additional concerns over COVID-19 that individuals with mental illnesses have to manage, social isolation, difficulties in accessing mental health support due to the changing workload of health services, and the constant attention the media gives to the disease.

The group most affected by the COVID-19 pandemic is the elderly.³² Therefore, although the anxiety levels of this group were expected to be higher, the result reported in the literature vary, showing low¹⁷ and high³⁴ anxiety levels related to COVID-19 in individuals older than 61. This study found that as age increased the anxiety level decreased accordingly, and that those in the 18–30 age group had higher anxiety levels than those of others. The reason for the low anxiety levels of the elderly individuals was believed to be due to their greater life experience and the protective role of crystallized intelligence, or ability to use acquired information, against adverse events.³⁵ Additionally, it can be suggested that individuals over 61 years of age (Odds = 0.361, $p < 0.05$, 95% CI = 0.139–0.935) have far more experience in life and therefore are able to come to terms with the disease and death more than that of younger individuals. Moreover, it could be that young and middle-aged individuals believe their risk of infection to be higher than that of the elderly because of their responsibilities in working and social life, which, in turn, would explain their greater anxiety. It could also be argued that their anxiety level increased on account of the fact that they are the most affected group in terms of the physical, psychological, economic, and social effects of this pandemic. Higher levels of anxiety lead to a higher risk of anxiety disorders.¹¹

The social and psychological effects of the pandemic have outpaced its physiological effects.⁵ It has been reported that women are more likely to experience anxiety because of their roles and that they are at greater risk of experiencing anxiety during the COVID-19 pandemic.^{5,17,31} Similarly, this study also found that females (Odds = 2.978, $p < 0.001$, 95% CI = 2.250–3.943) were at higher risk of experiencing anxiety. Moreover, females were more careful than males about following the preventive measures against COVID-19.³² When individuals experience strong concerns about their health, they are more likely to misinterpret their emotions and experience anxiety. The biggest factor responsible for the anxiety experienced by women is their gender roles. Women's domestic roles have increased significantly during the pandemic and thereby have contributed to the increase of their anxiety levels.³⁶ The concept of gender affects women and men differently in terms of health, social, cultural, and economic aspects. The risk of experiencing various diseases differs between men and women.³⁷ Additionally, gender roles dictate that women are more fragile than men, who symbolize power and fearlessness; therefore, women are able to express their illness more easily.³⁸ The meta-analysis study by Lim et al. also showed that depression is more common among women. The prevalence of depression was determined to be significantly higher in women (14.4%) compared to men (11.5%) ($p < 0.001$). The findings revealed that the proportion of women in the study population was one of the moderators explaining the heterogeneity of 1-year depression prevalence.³⁹ In this study, it is possible that the women were more willing than men to express their anxiety.

Alcohol and tobacco use is an important risk factor for lung diseases and viral and bacterial diseases.²⁴ It has been reported that there is a relationship between smoking and death rates from MERS (mers-Cov) and COVID-19, which have similar clinical characteristics.⁴⁰ However, misguided rumors about the benefits of smoking and high-volume alcohol drinks in killing the COVID-19 virus²⁴ have led to the excessive consumption of these products.⁴¹ Additionally, this can lead to people who consume these products having unwarranted confidence about being protected from COVID-19.⁴² This study also found that the anxiety levels of those who smoked and used alcohol were lower than those of the participants who did not smoke or use alcohol.

During the Covid-19 pandemic, some of the TV and internet news outlets have conveyed wrong/misleading information about COVID-19, causing the anxiety level of the society to rise.⁴³ This study determined that individuals who watched between 10 and 15 h of TV were at greater risk of anxiety. On the one hand, excessive exposure to information about COVID-19 can cause confusion, whereas on the other hand, choosing to ignore the news about COVID-19 can be seen as a method to cope with anxiety.¹⁷ On the contrary, reaching exact and relevant information can increase people's capacity to quickly respond to the Covid-19 pandemic. Therefore, it is important to know the most common sources of information used by people during the pandemic, which can help effectively decide how educational programs and communication activities can be maintained.⁴⁴ Governments and healthcare professionals should provide information the society about the precautions (using face masks, hygiene practices, recovered cases, infected regions, treatment opportunities, etc.) to be taken against COVID-19.⁴⁵ Tran et al.⁴⁴ conducted a study with medical specialists, medical students, and social workers and found that the most common sources of

information about the Covid-19 pandemic were mass media and peer educators. The least common sources of information were regulations and policies regarding COVID-19.⁴⁴

During the pandemic, individuals with a high level of knowledge have been shown to have lower anxiety levels.⁴⁶ Furthermore, it has been found that individuals with higher educational backgrounds have higher levels of knowledge and more informed attitudes about COVID-19.³² This study found that individuals with a lower educational background had lower anxiety levels and that those with a higher educational background had higher anxiety levels. This ironically supports the familiar adage, ignorance is bliss.⁴⁷ Even though having knowledge about Covid-19 symptoms can increase individuals' anxiety levels, it is important to note that having a lower knowledge level can have negative effects in terms of following protective measures and complying with isolation measures.

It has been well-established that healthcare professionals experience the highest anxiety.¹⁴ This study determined that healthcare professionals were at high risk for experiencing anxiety compared to that of other groups (laborers and public servants). A few factors are responsible for the increase in anxiety levels seen in healthcare professionals, including their proximity to risk groups, their changing shifts/working hours, and the worsening conditions or death of patients under their care. Moreover, the amount of time healthcare professionals must spend away from their families during this period has been shown to increase their anxiety levels.⁵

During the pandemic, various industries have experienced economic difficulties, which have negatively affected employers and have caused many people to lose their jobs.⁴⁸ The Turkish government has issued various legal regulations to help prevent workers from experiencing economic difficulties such as the "short-time working allowance"⁴⁹ and the "dismissal ban".⁵⁰ The uncertainty that will be experienced once the short-time working allowance and dismissal ban regulations are over could be one of the key factors responsible for increasing the anxiety level of those who are unemployed. Considering that individuals who are unemployed do not have a regular income and face fears about the future, they experience anxiety. This study did in fact find that unemployment caused by the Covid-19 pandemic increased individuals' anxiety levels.

The pandemic has led to many changes in daily life habits, including sleep patterns.¹⁷ The importance of digital devices has greatly increased during the pandemic, as they serve to replace face-to-face contact and allow people to socialize and communicate. Being exposed to the light from digital devices during sleep hours can affect sleep patterns.⁵¹ Anxiety caused by the news about COVID-19 may also be a factor that alters sleep patterns. Experiencing long periods of disturbed sleep can eventually lead to anxiety and develop into a vicious circle for individuals.²³ It has been shown that quality of sleep is negatively affected when anxiety increases.²² It has been reported that the Covid-19 pandemic has negatively affected the quality of sleep of society.²³ This is supported by the results from the present study, which showed that there were increased anxiety levels in the individuals (Odds = 4.397, $p < 0.01$, 95% CI = 3.346–5.777) who slept 0 to 5 h a day and reported that their sleep patterns were disturbed.

This study found that the participants who were living in an institution (nursing home) and those who were living with their parents had high anxiety levels. For those living in institutions, their anxiety levels may have

been impacted by concerns over whether or not they would get the expected support when they had a health issue because they were away from their families. Moreover, those living in institutions might experience a stronger sense of loneliness considering that institutions follow the isolation rules more strictly than that of families at home. The social isolation imposed during the pandemic has resulted in individuals being away from their family/friends, which indirectly leads to an increase in their anxiety levels.²¹ This finding is also believed to be due to the anxiety individuals experience about their parents being affected by COVID-19.

One of the causes behind the high anxiety levels of individuals living with their parents could be that parents reflect their worry on to their children. Moreover, worried parents might display overly protective behaviors toward their children.⁵² An interesting result from this study was that the anxiety levels of the individuals who lived alone were low; this is important because it suggests that people who live alone have not been as affected by pandemic-related restrictions and social isolation as one would expect and that they do not experience pandemic-related anxiety because they have maintained their existing routine along with the rest of the society. Lastly, this study found that singles experience higher anxiety than married individuals. This result could be explained by reasons similar to those of living alone.

Fast-growing technology has led to the replacement of face-to-face psychotherapy with Internet-based psychotherapy.⁵³ Effective psychological intervention programs should be developed to prevent the spread of anxiety in society during the pandemic. The levels of anxiety may increase more when the psychological interventions are staged through face-to-face therapies due to the risk of virus infection. Cognitive-behavioral therapy (CBT) is considered an effective method for people with anxiety and fear of death because of COVID-19 and for patients with mental disorders and other medical problems (insomnia, rheumatoid arthritis, chronic pain, etc.).^{45,53,54} It can be useful to plan Internet-based CBT practices during the pandemic for high-risk groups, such as inpatients, people in quarantine, women, children, and healthcare professionals.⁴⁵ Therefore, some of the hospitals have started to administer psychotherapy practices like online CBT and mindfulness-based cognitive therapy (MBCT). The CBT is provided through the Internet and its cost-efficiency is higher than antidepressants and traditional face-to-face psychotherapy. Moreover, it was proven that maladaptive coping behaviors can be reduced by managing stress, amending routine activity programs, and using relaxation techniques through online CBT.^{45,53} This study found that the Covid-19 pandemic caused sleep problems and that there was a significant relationship between insomnia and anxiety. Insomnia can be treated using the online CBT that has strong evidence of its efficiency.⁵⁴ It is also important to develop community-based practices through online CBT as a community-based intervention.

4.1 | Research limitations

One of the potential limitations of this study that should not be overlooked is that precautions, such as lockdown, social distancing, and use of face masks might also affect the mental health of healthy people. This study used the snowball sampling method to include participants in the study

regarding the data collected online just as Le et al.¹⁵ and Wang et al.⁷ did. This method provides significant information about the subject matter even though it does not represent the whole society. On the contrary, the participants' tendency to share the survey with their friends and relatives who had similar characteristics can cause sampling bias.^{7,15} Additionally, the psychological impacts reported by the participants may not be as objective as the assessments of mental health professionals.⁷ Besides, this study did not assess COVID-19 symptoms that could be associated with mental symptoms during the pandemic.

According to the results from the study of Wang et al.,⁵⁵ physical symptoms similar to COVID-19 infection are a risk factor for negative mental health outcomes (higher anxiety, depression, and stress). Low health literacy and the perceived impact of the pandemic have negative effects on mental health. The study of Wang et al.⁵⁵ also revealed reflections of these results during the pandemic. The study that used the Depression, Anxiety, and Stress Scale (DASS-21) scores (excluding Vietnam) found that the scores of these scales were higher than they were in the prepandemic period.⁵⁵ It seems like a mental health disease epidemic possibly breaks out after the pandemic.

The other limitation of this study were that the questionnaires were completely based on the participants' own statements and that online questionnaires were only filled out by people who had internet access and knew how to use smart phones, computers, or tablets.

This study also has strengths despite these limitations. This is an important study that provided the latest evidence regarding the status of the anxiety of patients, people in quarantine, and the whole society during the period in which the rules of national lockdown, social distancing, and use of face mask were enforced in Turkey. Moreover, using a standard measurement tool (BAS), performing the content validity of the Descriptive Information Form, and conducting a pilot study increased the validity of this study.

Physical symptoms need medical knowledge and the perceived effect of the pandemic is believed to have negative effects on mental health.

5 | CONCLUSION

This study determined that the anxiety levels of the hospitalized COVID-19 patients and the healthy individuals were high and that these two groups were at the risk of experiencing anxiety. The female gender, being 61 years of age and older, having psychiatric and chronic illnesses, and disturbed sleep patterns were determined to be the factors associated with high levels of anxiety. It is important to closely follow and plan prevention practices for the groups determined in this study to have high anxiety scores to best maintain the mental health of the society.

6 | IMPLICATIONS FOR NURSING PRACTICE

The study results showed that healthy individuals are especially at the risk of experiencing anxiety. Therefore, proper preventive mental health services need to be planned for society. In the planning of preventive mental health services,

women and individuals with chronic and mental illnesses should be prioritized, as these groups were determined to be the most at-risk groups. For these risk groups, online-sharing groups can be determined where they can express themselves, share their concerns and fears regarding the Covid-19 process, and produce solutions together. These sharing groups can be repeated intermittently throughout the Covid-19 pandemic and their effectiveness can be evaluated. Results of these practices and these data from the study contribute valuable information to healthcare practices.

CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

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How to cite this article: Tokur Kesgin M, Hançer Tok H, Uzun LN, Pehlivan Ş. Comparison of anxiety levels of hospitalized COVID-19 patients, individuals under quarantine, and individuals in society. *Perspect Psychiatr Care.* 2022;58:149-158. <https://doi.org/10.1111/ppc.12857>