

Anxiety Status and Associated Factors of Health Personnel Working in a Tertiary Hospital in Turkey in the COVID-19 Pandemic

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ABSTRACT

Aim: This research was conducted to evaluate the anxiety status and related factors of tertiary hospital personnel working in a densely populated area of Turkey during the COVID-19 pandemic.

Methods: A total of 555 participants were included in this cross-sectional, prospective study. A socio-demographic data form was created and the Beck Anxiety Scale was applied to participants for evaluating anxiety status.

Results: The rate of men 64.86% (n=360) and women 35.14% (n=195). The distribution of anxiety scores was in the range of 8.39±9.16. 58.2% of them (n=323) had low, 41.8% (n=232) had high anxiety scores. Factors like age, gender, marital status, working status in areas where treatment/care is provided to suspected/positive patients with COVID-19, and fear of carrying infection from work to home are found to be statistically significantly related to anxiety.

Conclusion: High anxiety scores were measured in almost half of the participants. Taking measures to improve risk factors can reduce the damaging effects of the challenging working conditions due to the ongoing COVID-19 pandemic on hospital personnel.

Keywords: anxiety, COVID-19, health, health personnel, pandemics

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Introduction

The Coronavirus Disease-2019 (COVID-19) pandemic has made subversive global effects and changes on many areas such as social norms, education system, socioeconomic structure, and people's physical and mental health (1). COVID-19, caused by SARS-CoV-2 (Severe Acute Respiratory Syndrome-Coronavirus-2), is transmitted by droplets and can be fatal with its severe pneumonia and accompanying complications (2). The first case of COVID-19 from Turkey was reported on March 11, 2020, on the same day with the declaration of the pandemic by the World Health Organization (WHO) (3,4). Despite all the precautions taken, there has been an increase in the need for hospitalization and intensive care in secondary and tertiary healthcare institutions in Turkey as well as in the world due to the rapid spread of the infection (5). The state of panic, uncertainty, unending intense and heavy working conditions, and constant close contact with deadly COVID-19 infected cases create a great burden on health workers both physically and mentally. Mortality rates are observed to increase among healthcare providers and fear of infecting their relatives as well as possibility of contracting the COVID-19 infection increases the anxiety state of hospital workers (6,7).

Anxiety disorders progress with symptoms such as excessive and constant anxiety, nervousness, unable to concentrate, muscle tension, sleep disturbance, and a constant feeling of tiredness in challenging conditions and are reported to occur at rates as high as 12% in children, 32% in adolescents and adults. Increased anxiety risk in health personnel working in pandemics can lead to a decrease in their motivation, quality of life, and work efficiency (8-12). To be able to protect their important position in the fight against the COVID-19 pandemic, the health personnel, who provide comprehensive services to the severely ill patients in hospitals need to be supported (6).

This research is conducted to reveal the anxiety status and related factors of the tertiary hospital personnel working in Harran University Medical Faculty which is a densely populated region in Turkey

during the COVID-19 pandemic process. We aim to contribute to further studies and the development of remedial policies in this regard.

Methods

This study was planned 1 month after the declaration of the COVID-19 pandemic on 11 March 2020 and it was designed as cross-sectional and prospective study. The dependent variable of the study was the anxiety status of the hospital personnel in the COVID-19 pandemic and the independent variables were age, gender, marital status, having children, living with someone over 60 years old at home, occupation, education level, having a chronic disease and actively working during the pandemic process. An online self-administered survey form, made available by Google, was used for data collection between 25th April and 25th May 2020.

The universe of this research consists of all hospital personnel working at Harran University Medical Faculty Hospital. Sample selection was not made and it was aimed to reach the entire population (162 specialist doctors, 255 vocational trainees, 300 nurses, 6 midwives, 90 data processing personnel, 120 patient caregivers /cleaning staff, 30 security guards). The inclusion criteria of the study were to have agreed to give consent to participate in the study, to be over the age of 18 and to be working at the Harran University Medical Faculty Hospital. The exclusion criterion was having any diagnosis of psychiatric disease.

A 13-question socio-demographic data form created by the researchers and the Beck anxiety inventory (BAI) were administered to all hospital personnel who gave consent to participate voluntarily. BAI is a self-assessment scale developed by Beck et al. used to determine the severity of anxiety experienced by individuals. It is a Likert-type scale consisting of 21 items and scored between 0-3. Participants were asked how much their feeling of distress in the previous week bothered them. 8-15 points are considered as mild, 16-25 points as moderate, and 26-63 points as severe anxiety. The validity and reliability study of BAI in Turkey was

carried out by Ulusoy et al. (13).

The data were analyzed using the IBM Statistical Package for the Social Sciences version 23 (SPSS Inc., Chicago, IL, USA), and were checked for normality using the Kolmogorov-Smirnov test, histogram, and skewness and kurtosis values. Mean, standard deviation (SD), minimum and maximum values were used to show descriptive statistics. Categorical variables were summarized with frequency (n) and percentage (%). To assess the relationship between categorical variables, Chi-square or Fisher's exact test was used, and in the event of a significant difference, follow-up tests with Bonferroni correction were conducted. The results were evaluated at a 95% confidence interval, and the significance level was $p < 0.05$.

This study was initiated after the approval of the Harran University Faculty of Medicine Non-Invasive Clinical Research Ethics Committee, dated 07/04/2020-E.15250 and numbered 66063783-622.99.

Results

Although 617 people were reached, the study was conducted with 555 people who answered the questions completely and met the inclusion criteria. The distribution of the age of the participants was 33.60 ± 8.60 (min:19, max:59). The education level of most of the participants was at the university level with the rate of 47.57% (n=264). The assistant doctors had the majority as 44.86% (n=249). Detailed data are given in Table 1.

Table 1. Sociodemographic and clinical characteristics of the participants

		n	%
Age range			
	≤ 25 yrs	101.00	18.20
	26-35 yrs	266.00	47.93
	≥ 36 yrs	188.00	33.87
Gender	Male	360.00	64.86
	Female	195.00	35.14
Marital status	Married	359.00	64.68
	Single	196.00	35.32
Education level	Literate	4.00	0.72
	Primary education	30.00	5.41
	High school	128.00	23.06
	University	264.00	47.57
	Master's and doctorate	129.00	23.24
Occupation	Doctor	156	28.11
	Assistant health personnel	249	44.86
	Caregiver, cleaning staff	52	9.37
	Others	98	17.66
Child	One or more	320.00	57.66
	No	235.00	42.34
Living with any elderly over 60 years old at the same home	Yes	82.00	14.77
	No	473.00	85.23
Chronic disease	One or more	118.00	21.26
	No	437.00	78.74
Type of chronic disease	Diabetes	11.00	9.32
	Hypertension	23.00	19.49
	Lung disease	23.00	19.49
	Cardiac disease	20.00	16.95
	Cancer	1.00	0.85
	Immunosuppression	3.00	2.54
	Others	37.00	31.36

** Standard deviation

During the pandemic period, 56.58% (n=314) of the participants continued full-time working and 41.80% (n=232) of them participated in the

examination of COVID-19 patients in the pandemic outpatient clinic and services. 51.53% (n=286) of the participants were afraid of being infected %37,12

(n=206) and 65.95% (n=366) of them worried that their relatives could be infected with COVID-19.

Detailed data are given in Table 2.

Table 2. Working conditions and COVID-19 related stressors

		n	%
Working hours	Full-time	314	56.58
	Flexible	205	36.94
	Administrative leave	36	6.49
Working status in areas where treatment/care is provided to COVID-19 suspected/positive patient	Yes	232	41.80
	No	323	58.20
Concern about contracting COVID-19	Yes	286	51.53
	No	63	11.35
	Partially	206	37.12
Concern about the contagion of COVID-19 to relatives	Yes	366	65.95
	No	40	7.21
	Partially	149	26.85
Concern about carrying the COVID-19 virus from work to home	Yes	398	71.71
	No	35	6.31
	Partially	122	21.98
COVID-19 Test	Yes	36	6.49
	No	519	93.51
COVID-19 Treatment	Yes	5	8.20
	No	56	91.80
Quarantine isolation status	Yes	5	8.20
	No	56	91.80
Has anyone in the family who has been infected with COVID-19?	Yes	67	12.07
	No	488	87.93
Anyone in the family who has been died due to COVID-19	Yes	23	4.14
	No	532	95.86
Education on COVID-19	Yes	341	61.44
	No	214	38.56
Use of personal protective equipment	Yes	292	52.61
	No	59	10.63
	Partially	204	36.76

Anxiety scores of 58.2% (n=323) of the participants were low, and 41.8% (n=232) were high. A significant relationship was found between age and anxiety risk groups ($\chi^2(2)=17.636$, $p<0.001$) (Table 3). In multiple comparisons, it was found that the participants aged ≤ 25 (56.44%) had higher anxiety scores, and the scores in this group were significantly higher than the participants aged ≥ 36 (31.38%). The women (57.95%) had higher anxiety scores ($\chi^2(1)=32.218$, $p<0.001$) than men (33.06%). Singles (48.98%) had higher anxiety scores than married (37.88%) ($\chi^2(1)=6.417$, $p=0.011$). Those who had no children (49.36%) had higher anxiety scores ($\chi^2(1)=9.575$, $p=0.002$) (Table 3).

Chi-square analysis found a significant relationship between occupation and anxiety risk groups ($\chi^2(3)=26.962$, $p<0.001$). Multiple

comparisons made with post-hoc analysis found that vocational trainees (50.60%) had a significantly higher anxiety score than the caregivers or cleaning personnel (17.31%). Participants with one or more chronic diseases had higher anxiety scores than those without a chronic disease ($\chi^2(1)=7.106$, $p=0.008$). There was a significant relationship between working status and anxiety, in areas where treatment/care services were provided to COVID-19 suspected/positive patients, and those working in these areas (50.9%) had higher scores ($\chi^2(1)=13.451$, $p<0.001$) (Table 3).

Higher anxiety scores ($\chi^2(1)=11.779$, $p=0.001$) were found in those whose relatives were infected with COVID-19 (61.19%). Also, those who lost their relatives due to infection (65.22%) had higher scores than those who did not (40.79%) ($\chi^2(1)=5.408$, $p=0.020$) (Table 3).

Table 3. Anxiety level associated with risk factors

	Low risk (BAI score ≤ 7) n (%)	High risk (BAI score ≥ 8) n (%)	χ^2	df	p
Age			17.636	2	<0.001
≤ 25	44 (43.56)	57 (56.44)			
26 - 35	150 (56.39)	116 (43.61)			
≥ 36	129 (68.62)	59 (31.38)			
Gender			32.218	1	<0.001
Male	241 (66.94)	119 (33.06)			
Female	82 (42.05)	113 (57.95)			
Marital status			6.417	1	0.011
Single	100 (51.02)	96 (48.98)			
Married	223 (62.12)	136 (37.88)			
Child			9.575	1	0.002
One or more	204 (63.75)	116 (36.25)			
Non	119 (50.64)	116 (49.36)			
Elderly at the same home			1.312	1	0.252
Yes	43 (52.44)	39 (47.56)			
No	280 (59.20)	193 (40.80)			
Occupation			26.962	3	<0.001
Doctor	88 (56.41)	68 (43.59)			
Assitant health personel	123 (49.40)	126 (50.60)			
Caregiver, cleaning personnel	43 (82.69)	9 (17.31)			
Others	69 (70.41)	29 (29.59)			
Education			-	-	-
Literate	3 (75.00)	1 (25.00)			
Primary level	25 (83.33)	5 (16.67)			
Highschool	75 (58.59)	53 (41.41)			
University	144 (54.55)	120 (45.55)			
Master's and doctorate	76 (58.91)	53 (41.09)			
Chronic disease			7.106	1	0.008
One or more	56 (47.46)	62 (52.54)			
Non	267 (61.10)	170 (38.90)			
Working hours in pandemic			2.076	2	0.354
Full-time	179 (57.01)	135 (42.99)			
Flexible	126 (61.46)	79 (38.54)			
Administrative leave	18 (50.00)	18 (50.00)			
Working status in areas where treatment/care is provided to COVID-19 suspected/positive patients			13.451	1	<0.001
Yes	114 (49.1)	118 (50.9)			
No	209 (64.7)	114 (35.3)			
COVID-19 Treatment *					0.367
Yes	2 (40.00)	3 (60.00)			
No	34 (60.71)	22 (39.29)			
Quarantine isolation status *			-		0.642
Yes	2 (40.00)	3 (60.00)			
No	33 (58.93)	23 (41.07)			
Has anyone in relatives been infected with COVID-19?			11.779	1	0.001
Yes	26 (38.81)	41 (61.19)			
No	297 (60.86)	191 (39.14)			
Has any of the relatives died due to COVID-19?			5.408	1	0.020
Yes	8 (34.78)	15 (65.22)			
No	315 (59.21)	217 (40.79)			
Education on COVID-19			.202	1	0.653
Yes	201 (58.94)	140 (41.06)			
No	122 (57.01)	92 (42.99)			
Use of personal protective equipment			3.752	2	0.153
Yes	181 (61.99)	111 (38.01)			
No	33 (55.93)	26 (44.07)			
Partially	109 (53.43)	95 (46.57)			
Concern about contracting COVID-19			47.294	2	<0.001
Yes	134 (46.85)	152 (53.15)			
No	58 (92.06)	5 (7.94)			
Partially	131 (63.59)	75 (36.41)			
Concern about the contagion of COVID-19 to relatives			38.393	2	<0.001
Yes	181 (49.45)	185 (50.55)			
No	36 (90.00)	4 (10.00)			
Partially	106 (71.14)	43 (28.86)			
Concern about carrying the COVID-19 virus from work to home			31.518	2	<0.001
Yes	203 (51.01)	195 (48.99)			
No	30 (85.71)	5 (14.29)			
Partially	90 (73.77)	32 (26.23)			

*Fisher's exact test

Those with fear of getting COVID-19 infection (53.15%) had significantly higher scores ($\chi^2(2)=47.294$, $p<0.001$). In participants with concern about the contagion of COVID-19 to relatives (50.55%), significantly higher anxiety scores were found ($\chi^2(2)=38.393$, $p<0.001$). Anxiety scores were also found to be significantly higher among those who were worried about carrying infection from work to home (48.99%) ($\chi^2(2)=31.518$, $p<0.001$) (Table 3).

Discussion

During the COVID-19 pandemic, hospital health personnel provide uninterrupted service in close contact with seriously ill patients carrying the deadly virus. Under challenging conditions, hospital employees may develop mental illnesses, especially anxiety disorders, which may adversely affect their quality of life and work efficiency. The present study is based on the belief that revealing the mental problems of hospital workers is an important step for developing measures to protect and improve their physical and mental health. In this study, in which the anxiety levels of 555 tertiary hospital personnel were evaluated, it was determined that the anxiety scores were in the range of 8.39 ± 9.16 . 41.8 % showed high anxiety scores and 58.2% had low anxiety scores. Although the majority was male participants, it was observed that women had higher anxiety scores than men.

It was observed that the anxiety scores of the participants aged 25 and under were higher than those aged 36 and over. Huang and Ning also reported that anxiety symptoms were more common in participants younger than 35 years of age. The high risk of anxiety in young participants can be explained by the fact that those in this group have less professional experience and have difficulty in managing the conditions (12).

Lai et al. (14) reported the anxiety rate was 44.6% in China. In their study, the ages of the participants were in the young age range, similar to our study, and anxiety scores were found to be higher in women than in men (14). In a meta-analysis on this subject in the literature, it was reported that the risk of anxiety was high in women, which was similar with our study (15).

In the present study, more than half of the women (57.9%) had high anxiety scores, which is quite higher than the rate found by Lai et al. (14) (5.8%). Although the anxiety scores of men were lower than of women in both studies, the anxiety scores of men (33.06%) in this study were significantly higher than in the Lai et al. (14) study (3.4%). Regional, sociocultural factors and working conditions can have influenced the scores. In addition, the fact that the crude death rate due to COVID-19 infection in men (4.7%) was declared to be higher than in women (2.8%), may have increased the risk of anxiety in men (16). Regulations to improve working conditions and motivation-enhancing individual interviews can contribute positively to alleviating and improving the anxiety of employees (15).

Gupta et al. (17) reported the rate of anxiety disorder at 37.3% in Nepal, the majority of which was mild. Besirli et al. (18) in their study with 200 participants, anxiety scores were found to be 8.2 ± 9.2 , similar to this study, and it was reported that 25.5% of the participants had low and 5.5% had high BAI scores. Another study from Turkey reported advanced anxiety in 22.7% of hospital workers (19). Huang et al. (20) reported that the prevalence of anxiety and stress disorder among healthcare personnel is high in the new coronavirus pandemic. In a meta-analysis in which, it was reported that mild anxiety was observed in 17.93% and moderate/severe anxiety in 6.88% (21). In the presented study, low anxiety scores were measured relatively more (58.2%) than high scores (41.8%).

Pappa et al. (21) reported anxiety rates at 23.2% for doctors and 25.80% for nurses. In the presented study, the vocational trainees had the majority (44.86%) and was followed by doctors at 28.1%. The high anxiety scores detected in the vocational trainees, most of whom were created by nurses, may be due to their long-term work in closer contact. In the literature, it has been reported that the increase in the end-of-life care duties of nurses in the COVID-19 pandemic of terminally ill patients who cannot even touch their relatives, increase the risk of anxiety (22-24) Lai et al. (14) reported that special attention should be paid to the mental health well-being of women and nurses

treating COVID-19 patients.

In this study, the rate of high anxiety scores in caregivers and cleaning personnel were found to be 17.31%. The anxiety rates are reported to be high in this group of employees in the literature similar to this study. It can be explained by the high contact with patients with the deadly COVID-19 virus and contaminated materials during their duties, and the fear of transmission of the disease to them (14). Unlike our study, Chan et al. (25) showed that in the 2003 SARS pandemic, the risk of mental problems is higher (1.6 times) for doctors than for nurses. The high anxiety scores detected in doctors in this study may be due to reasons such as increased workload and responsibilities, adapting to new protocols and new norms, and being confronted with a deadly infection. Also, the fact that; vaccine production studies have not yet been concluded in the first months of the COVID-19 pandemic should have an important role in the development of anxiety in participants.

Mo et al. (26) reported having a child and not being able to spare enough time for domestic responsibilities during the COVID-19 pandemic, as the causes of anxiety. Most of the participants in the presented study were married and had children and it is shown that those who did not have children had higher anxiety scores than those who had one or more children. Woon et al. (27) in their study showed that, participants with multiple children were reported of being with their children reduced their stress associated with COVID-19. In the presented study, higher anxiety scores were found in singles than in married people similar to the results of Polat et al.'s (19).

A study from China determined that the married or divorced participants who participated in controlling COVID-19 were affected more negatively than singles (28). In another study conducted in two university hospitals in Malaysia, it was reported that anxiety was detected in 31.6% of the participants, and the severity of anxiety was moderate to severe at a rate of 25.8%. Being single or separated and having more than three children were found to be associated with high anxiety scores similar to our study (27). The

increased risk of anxiety in single or divorced individuals can be explained by reasons such as being alone and not being financially supported in an uncertain situation like the COVID-19 period (29).

Participants with one or more chronic diseases (52.54%) were found to have higher anxiety scores than those without a chronic disease (38.90%) in the presented study. Gupta et al. (17) also reported that the presence of comorbidity was associated with high anxiety.

In this study, the participants who reported that they were living with their relatives over 60 years of age at the same home had higher anxiety scores than those who were not. The fact that the risk of death increases in advanced age and the presence of chronic diseases can increase anxiety in health workers (16,17). Restricting the contact of healthcare professionals with elderly relatives at home as long as they work and receive social support for the care of their relatives can reduce their concerns. In addition, in the presence of comorbidities, it will be important to take steps in protecting hospital personnel by reducing their workload by arranging flexible working opportunities, monitoring their health status more closely, taking necessary precautions, vaccinating themselves and especially the elderly.

In this study, 52.6% of the participants who were using personal protective equipment (PPE) had lower anxiety scores than partial users and non-users. A study from Turkey reported a relationship between the depression, anxiety, and stress scores of health workers who used PPE during the COVID-19 pandemic (19). The feeling of being protected correctly in environments with a high risk of infection is reported to reduce the negative psychological impacts on health workers. The use of PPE should be an important step in preventing the physically and mentally negative effects of anxiety in healthcare workers (19).

In this study, more than half of the participants who were worried about contracting the infection had high anxiety scores. Adams and Walls reported that 3000 health workers in China got the disease, 22 of them died, and the high risk of COVID-19 infection

transmission to health workers increased the concerns of hospital personnel (30,31). Similar to this study, it has been reported that the stress levels of hospital workers may increase due to the fear of transmitting the infection to their relatives if they are infected with the virus and if they continue to work in the hospital environment. It has been shown that the risk of anxiety is increased in healthcare workers in a correlation with stress (26,30,32). In the presented study the participants who had a concern about the contagion of COVID-19 to relatives had higher anxiety scores. In the study by Nemati et al. (33), it was reported that relatives of 1.17% of the participants were infected and the participants had high anxiety scores about infection transmission to their families (6.87 ± 2.8). In this study, the rate of having infected relatives was found to be higher (12.07%) (33). Mo et al. (26) also reported the concern of carrying the infection to home as a reason for anxiety.

Bostan et al. (7) reported that the results were positive in more than half of those who had tested for the diagnosis of COVID-19. In this study, the majority of the participants (93.51%) did not have a COVIDtest.

Losing their relatives from COVID-19 infection (65.22%) was found to be significantly associated with high anxiety scores in this study. Conducting COVID-19 tests of healthcare workers and their relatives can reduce their anxiety by providing a chance for early recognition and treatment of the infection. During active working periods, training on physical distance, mask use, and hand hygiene should be updated. If possible, immediate vaccination of themselves and their relatives can contribute positively to the prevention and improvement of the development of anxiety in employees (27).

According to the literature, being isolated can be a cause of mental trauma (34-36). In this study, the rate of quarantine due to COVID-19 was low (8.20%), and no significant relationship with anxiety could be detected. Woon et al. (27) similar to this study reported the rate of participants who were quarantined in their studies as in low (7.8%) levels, and no significant relationship was found between being quarantined and

anxiety scores. In another recent study, 40.6% of those who were quarantined due to COVID-19 were found to have moderate to severe anxiety (37).

In this study, there is a statistically significant relationship between working status and anxiety in areas where treatment/care services are provided to COVID-19 suspected/positive patients, and it has been observed that anxiety scores in these areas (50.9%) are significantly higher than those who do not work (35.3%). Yıldız et al. (38) reported that anxiety scores were found to be significantly higher in correlation with working in hospital service units during the pandemic (38). Bostan et al. (7) showed that 31.7% of the participants were in contact with cases, 27.3% of them served patients diagnosed with COVID-19, and there was a significant relationship between the occupational groups of those who contacted and serviced to COVID-19 cases.

It has been reported in the literature that anesthetists and physicians working in intensive care units, and people working in some radio-diagnostic fields are likely to encounter patients with a suspected or definitive diagnosis of COVID-19. This situation raises concerns about infecting themselves and their families. In this case, it is thought that they need to be supported to improve their mental health since they are more likely to experience anxiety and depression (39). Woon et al. (27) found a significant relationship between worrying about frequent contact with COVID-19 patients due to their tasks (48.11%).

This study was conducted in a single center. It could provide us stronger evidence if the participation of employees from different hospitals was possible. The fact that vaccine production studies were not yet completed at the time of this study, may have affected the anxiety scores of the hospital personnel. Despite the limitations, we believe that this study will contribute positively to new further studies on this subject.

Conclusion

In this study, which investigated the anxiety status and related factors in tertiary hospital personnel in Turkey during the COVID-19 Pandemic, it was found

that nearly half of the participants had high anxiety scores and the relative majority of them had mild anxiety scores. The challenging pandemic conditions will likely continue for a long time. We believe that the mental health status of hospital workers should be taken seriously within the scope of employee health

and safety issues. In addition to reducing the workload by strengthening primary health care services and controlling the number of cases; arrangements to be made for the risk factors identified in this study may reduce the negative effects of the ongoing COVID-19 pandemic on hospital personnel.

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