

An examination of the anxiety states of Turkish health care workers during the COVID-19 pandemic: a cross-sectional study

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SUMMARY

OBJECTIVE: The aim of this study was to evaluate the anxiety experienced by health care workers in different branches during the COVID-19 pandemic.

METHODS: The cross-sectional study included 373 health care workers. Data were collected using an online questionnaire consisting of the Sociodemographic Form (32 items related to the working conditions of health care professionals during the COVID-19 pandemic) and the Penn State Concern Questionnaire.

RESULTS: The anxiety levels of the female workers were significantly higher ($p < 0.001$). The total Penn State Concern Questionnaire points were determined to be statistically significantly higher in those who need to protect the family during the pandemic ($p = 0.03$), who were dissatisfied with their profession ($p < 0.001$), and those whose workload had increased during the pandemic ($p = 0.007$).

CONCLUSIONS: The study results demonstrated that the levels of anxiety of health care workers during the COVID-19 pandemic could be increased by young age, low level of experience, female gender, increased workload, and dissatisfaction with the profession.

KEYWORDS: Healthcare workers. Anxiety. COVID-19 pandemic. SARS-CoV-2.

INTRODUCTION

The field of health care is a professional arm that brings different professional groups together to provide health care services under intense and hard working conditions¹. Health care professionals have the responsibility and an important role in combatting the COVID-19 pandemic, and they are a high-risk group regarding infection². They may experience various health problems while delivering health care services. The intense stress felt by patients and their relatives because of uncertainties and unknown aspects of the disease can have a negative impact on health care personnel³. This situation experienced by health care professionals reveals the concept of anxiety, which is difficult to control⁴⁻⁶.

The emergence of potentially negative working conditions in the field of health care can lead to quantitative and qualitative deteriorations in the work conducted^{7,8}. It is thought that negative situations, such as intense work tempo, epidemics, anxiety about becoming infected and spreading disease to family, and the need to support patients and their relatives, affect work-related tension and stress⁹. These situations can

have a negative effect on work performance and lead to outcomes such as decreased job satisfaction or leaving work¹⁰. In a recent study, it was reported that health care workers who were not sure whether or not they were infected with COVID-19 were more anxious and worried, and less satisfied with their job, and that those in the private sector had better mental health than those in the public sector¹¹.

The COVID-19 pandemic has deeply affected the whole world, and to be able to better explain the effects and to determine effective treatment methods, scientific studies have been and are still being conducted^{12,13}. Studies that have evaluated the effects of COVID-19 on health care workers have generally focused on health care professionals working in certain countries. Most studies examined the anxiety status of health care professionals working in China. Considering that different countries have different health policies, the pandemic effects on health care professionals in other countries are needed to be investigated¹⁴. The aim of this study was to evaluate the anxiety experienced by Turkish health care workers who are making great efforts in the struggle against the COVID-19 pandemic.

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Conflicts of interest: the authors declare there is no conflicts of interest. Funding: none.

Received on October 23, 2021. Accepted on December 20, 2021.

METHODS

Design and study participants

This cross-sectional study included health care personnel who actively work in public or private health care institutions. The sample size was calculated using the G.Power-3.1.9.2 software. As a result of the analysis, it was determined that a sample size of 373 subjects provided an effect size of 0.3636 at $\alpha=0.05$, and the study power calculated *post hoc* after the study was 0.91. The minimum power value required for the *post hoc* analysis was found to be 0.67. Therefore, the sample size was at an acceptable level.

Inclusion criteria were as follows: health care personnel with active duties in public or private health care institutions during the COVID-19 pandemic, no communication disability, and no physical disability. Employees other than health care personnel (e.g., imam, security staff, and cleaning staff) and those who did not want to participate were excluded from the study.

Data collection tools

Data were collected with an online questionnaire created on the Internet. This online questionnaire consisted of two sections of the Sociodemographic Form (32 items related to the working conditions of the health care personnel during the COVID-19 pandemic) and the Penn State Worry Questionnaire (PSWQ). The online questionnaire was created using Google Forms and was shared on different Internet platforms (e.g., WhatsApp, Gmail, Facebook, Instagram, and Twitter). The study data were shared by the researchers at specific intervals (2 days a week) between August and October 2020, and the responses were recorded on the Internet.

Penn State Worry Questionnaire

The Turkish version of PSWQ was used to assess the participants' anxiety levels. It is a self-reported scale comprising 16 items with 5-point Likert-type responses, score ranging from 1 (this is never true for me) to 5 (this is always true for me). Higher points indicate a higher level of anxiety¹⁵.

Statistical analysis

Data obtained in the study were analyzed statistically using SPSS version 25 software (Statistical Package for Social Sciences). The conformity of the research data set to normal distribution was assessed with the Shapiro-Wilk test. When evaluating the descriptive statistics of the study participants, number (n) and percentage (%) distribution and mean \pm standard deviation (SD) values were used. The independent samples t-test was

used for the comparisons of two groups of numerical data, and for more than two groups of independent variables, one-way ANOVA was used. Multiple linear regression analysis was used to determine the change in anxiety. A dummy variable was used in the model. The reliability of the scales used in the study was examined using the Cronbach's alpha reliability coefficient. A value of $p<0.05$ was accepted as statistically significant. Permission to conduct the study was obtained from the IU-C Research Ethics Committee (Decision No: 60116787-020/41133).

RESULTS

The research was completed with the data of 373 health care professionals who met the study criteria and agreed to participate in the study. The mean age of the study subjects was 34.42 ± 10.52 years (range: 21–73 years), and the mean duration of professional experience was 11.35 ± 10.23 years (range: 1–45 years). When the PSWQ points were compared according to gender, a statistically significant difference was determined regarding females ($p<0.001$) (Table 1).

In the comparison of the PSWQ total scores according to the responses to questions, a statistically significant difference was determined in the anxiety scores of feeling the need to protect the family during the pandemic ($p=0.03$), infection of someone in their close environment ($p=0.04$), being dissatisfied with the job ($p<0.001$), worrying about becoming infected ($p<0.001$), thinking that COVID-19 precautions are insufficient ($p<0.001$), being exposed to heavy workload ($p=0.007$), and wishing to change profession ($p<0.001$) (Table 2).

According to the regression analysis results, female workers ($\beta: 0.132, p=0.009$), those with somebody infected in their close environment ($\beta: 0.104, p=0.043$), those who feared becoming infected ($\beta: 0.202, p<0.001$), and those who wished to change their profession ($\beta: 0.109, p=0.047$) were found to be more worried. The change occurring in the scale total was found to be explained by independent variables at the rate of 13% ($R^2=0.130$). As the Durbin and Watson value was between 1.5 and 2.5, this showed that there was no autocorrelation problem in the model (Durbin-Watson=2.363) (Table 3).

DISCUSSION

According to the results of this study, which examined the effect of the COVID-19 pandemic on the anxiety state of health care workers, lower age and professional experience were found to increase the level of anxiety. Female health care workers, those who felt the need to protect their family during

Table 1. Comparison of the participants' Penn State Anxiety Total Scores according to the descriptive characteristics.

Variables		n	%	\bar{X}	SD	Test value	p
Age (years)		373		34.42	10.52		
Professional experience (years)		373		11.35	10.23		
Gender	Male	132	35.4	45.54	11.51	-3.249**	0.001*
	Female	241	64.6	49.80	12.43		
Marital status	Married	206	55.2	47.50	12.17	-1.395**	0.164
	Single	167	44.8	49.28	12.36		
Number of children	None	195	52.3	48.84	12.64	1.178***	0.318
	1	82	22.0	49.13	11.64		
	2	83	22.3	46.07	12.21		
	3 and above	13	3.5	49.00	10.32		
Education	High school	8	2.1	52.25	11.46	0.444***	0.722
	Associate degree	43	11.5	47.02	11.30		
	Licence	183	49.1	48.25	12.43		
	Postgraduate	139	37.3	48.51	12.45		
Profession	Doctor	55	14.7	49.38	11.63	0.228***	0.923
	Nurse - Midwife	113	30.3	48.38	12.52		
	Physiotherapist	73	19.6	48.60	12.57		
	Dentist	88	23.6	47.56	13.33		
	Health technician	44	11.8	47.66	9.85		
Working in a pandemic hospital	Yes	176	47.2	48.98	12.36	1.019**	0.309
	No	197	52.8	47.68	12.19		
Chronic disease	None	308	82.6	48.05	12.30	1.885***	0.096
	Diabetes	7	1.9	48.71	4.39		
	Hypertension	15	4.0	43.60	13.54		
	Heart disease	10	2.7	56.60	12.42		
	Pulmonary disease	8	2.1	55.00	17.04		
	Other	25	6.7	48.56	9.34		
Use of medication	Yes	60	16.1	49.33	12.36	0.717**	0.474
	No	313	83.9	48.09	12.26		

*p<0.05, **Independent t-test, ***one-way ANOVA. Bold indicates statistically significant values.

the pandemic, and those who were worried about becoming infected and having infected people around them were also found to have higher levels of anxiety. In addition, the health care workers whose workload increased during the pandemic, those who were dissatisfied with their profession, those who wished to change their profession, and those who thought the COVID-19 precautions in their workplace were insufficient were also determined to have higher levels of anxiety.

In parallel with the results of our study, the vast majority of studies conducted during the COVID-19 pandemic have

reported that female health care workers had higher levels of anxiety than their male counterparts^{16,17}. This result was thought to be due to females taking on primary roles in the home (wife, parent) and internalizing the fear of contagion more^{18,19}. In addition, when it is considered that more than 64% of this study sample was female, this result should be considered in this context. In a study by Santamaria et al, it was noted that together with the female gender, those of older age also had higher levels of anxiety²⁰. In contrast, the results of this study found older age to be in negative proportion

Table 2. Comparison of the participants' Penn State Anxiety Total Scores according to the answers given to the questions about pandemic conditions.

Variables		n	%	\bar{X}	SD	Test Value	p	Post-hoc
Need to be isolated from the family during the epidemic	Yes	322	86.3	48.81	12.24	2.071	0.03*	
	No	51	13.7	45.00	12.01			
Working night shift at hospital	Yes	187	50.1	48.65	12.71	0.568	0.57	
	No	186	49.9	47.93	11.82			
Taking part in risky units when needed	Yes	200	53.6	49.29	12.14	1.701	0.09	
	No	173	46.4	47.13	12.35			
Any infected person in the environment	Yes	132	35.4	50.00	11.98	1.997**	0.04*	
	No	241	64.6	47.35	12.35			
Lost a loved one during the COVID-19	Yes	24	6.4	46.33	17.09	-0.808	0.42	
	No	349	93.6	48.42	11.88			
Been infected during the pandemic	Yes	15	4.0	42.46	13.17	-1.883	0.06	
	No	358	96.0	48.53	12.19			
Job satisfaction	Very satisfied ¹	132	35.4	45.29	12.65	7.095***	<0.001*	1<3, 2<3
	Somewhat satisfied ²	159	42.6	48.54	11.38			
	Not satisfied ³	57	15.3	53.92	13.32			
	Not sure ⁴	25	6.7	49.68	8.10			
Worry about being infected	Yes	290	77.7	49.49	11.65	4.794	<0.001*	
	No	56	15.0	41.48	13.48			
Thinking that Covid-19 precautions are sufficient	Yes ¹	109	29.2	44.62	11.72	7.608***	0.001*	1<2
	No ²	165	44.2	49.24	12.28			
	Not sure ³	99	26.5	50.74	12.04			
Increase in the workload after the pandemic	Yes	224	60.1	49.67	12.26	2.698**	0.007*	
	No	149	39.9	46.20	12.01			
Request to change profession	Yes	180	48.3	50.77	12.23	10.24***	<0.001*	
	No	143	38.3	44.77	11.70			
	Not sure	50	13.4	49.42	11.82			
Difficulties in accessing personal protective equipment	Yes	182	48.8	49.51	12.46	1.887**	0.06	
	No	191	51.2	47.12	11.99			

*p<0.05, **Independent t-test ***One-way ANOVA. Bold indicates statistically significant values. ^{1,2,3,4} Multiple comparisons: Bonferroni (see Post-hoc).

Table 3. Results of multiple regression analysis: the effect of participants' answers to questions on Penn State Anxiety Total Scores.

Dependent variable	Independent variable	β	SE	t	p	F	Model (p)	R ²	Durbin-Watson
PSWQ score	Constant	38.176	1.976	19.315	<0.001	6.769	0.000*	0.130	2.363
	Gender=Female	0.132	1.291	2.623	0.009				
	The need to be isolated from the family during the epidemic=Yes	0.014	1.851	0.262	0.794				
	Any infected person in the immediate environment=Yes	0.104	1.313	2.030	0.043				
	Job satisfaction = Not satisfied	0.123	1.839	2.281	0.023				
	Worry about being infected=Yes	0.202	1.502	3.955	<0.001				
	Thinking that COVID-19 precautions are sufficient=No	-0.050	1.295	-0.948	0.344				
	Increase in the workload after the pandemic=Yes	0.041	1.245	0.820	0.413				
	Request to change profession=Yes	0.109	1.348	1.990	0.047				

PSWQ: The Penn State Worry Questionnaire, *p<0.05. Bold indicates statistically significant values.

to anxiety. The reason for this difference could be, as stated by Laranjeira et al, that younger health care workers are assigned to active work in COVID-19 wards that require a heavy workload²¹.

In parallel with our results, several previous studies have reported that health care workers experience fear of becoming infected because of their work and are worried about the risk of infecting family and friends. In a study conducted in Africa, Chersich et al. reported that health care workers caring for COVID-19 patients were faced with the anxiety of separation from their families and the loss of patients or colleagues. Limited intensive care units and lack of personal protective equipment, in particular, have also been reported to create anxiety between health care workers and their families²². The rapid spread of COVID-19 and the high morbidity and mortality rates could be another factor further increasing existing anxiety.

In a study by Mehta et al., the increased workload and lack of personal protective equipment were reported to increase the anxiety of health care workers and cause them to isolate from their families²³. In another study, lack of personal protective equipment and other medical supplies was reported to create a primary source of anxiety for health care workers, and this could have destructive effects on the health care system²⁴. In another study, it was reported that the fear of becoming infected increased anxiety in nurses and that this was associated with the wish to leave work²⁵. Similar to these findings, the predominant factors increasing anxiety in health care workers in this study were seen to be an increased workload during the pandemic and insufficient precautions against COVID-19 in the workplace. Furthermore, the health care workers in this study with high levels of anxiety were found to be dissatisfied with the profession. Unlike the findings of previous studies, access to personal protective equipment did not increase anxiety. This difference could be attributed to this study data having been collected in the period of August–October when health care workers did not experience problems in accessing protective equipment, unlike the early stages of the pandemic.

Strengths and limitations

One of the significant strengths of this study is that the anxiety states of different health care professionals were evaluated. Another strength was that health care professionals working in different health care centers across the country were included. Moreover, the effect on anxiety of several parameters related to working conditions during the COVID-19 pandemic was

evaluated. Although it seems that beneficial results have been obtained with vaccinations and the workload of health care professionals has been reduced, the COVID-19 pandemic is continuing with the effect of different variants of the virus. Taking this into consideration, the most significant limitation of this study was the limited data collection dates and that a long-term follow-up was not included.

CONCLUSIONS

The anxiety levels of health care workers, who play a key role in the struggle against the COVID-19 pandemic, can be increased by young age, low experience, female gender, fear of being infected and contagion, increased workload, insufficient precautions against COVID-19 in the workplace, and dissatisfaction with the profession. For a more effective fight against COVID-19, it is necessary to identify situations that cause anxiety in health care workers. It is very important to develop coping strategies to eliminate these situations and to provide psychological support for health care workers during the pandemic. However, further studies with larger samples are recommended to examine the long-term effects of crises and epidemics on health care workers.

ETHICS COMMITTEE APPROVAL

Permission to conduct the study was obtained from the Istanbul University-Cerrahpasa Medical Research Ethics Committee and the Ministry of Health (Ethics Committee Decision No: 60116787-020/41133). Consent to participate was obtained from the study subjects by adding a Voluntary Participation Form to the online questionnaire prepared through the interface of Google Forms, and the consent was recorded on the Internet.

ACKNOWLEDGMENT

We would like to thank all health care professionals for their participation in this study.

AUTHORS' CONTRIBUTIONS

AC, EZ, SOA, BBC: Conceptualization, Methodology, Data curation, Formal Analysis, Investigation, Writing – original draft, and Writing – review & editing. **BBC:** Conceptualization, Methodology, Project administration, Supervision, and Validation.

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