








The initial psychological impact of the COVID-19 pandemic on healthcare professionals in a children's hospital

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ABSTRACT

Aims: The pandemic has had devastating effects across the world particularly on healthcare professionals. We assessed anxiety and depression with somatization to discover the psychological effects of the pandemic.

Methods: 250 healthcare workers in a tertiary pediatric teaching hospital were asked to respond to the questionnaire between 1 and 30 June 2020 and the responses were assessed via three scales including the Patient Health Questionnaire 9 (PHQ-9), the General Anxiety Disorder 7 (GAD-7) and the Somatosensory Amplification Scale (SSAS).

Results: A total of 242 participants responded (response rate 97%); 29% of the participants reported moderate or severe anxiety while 49% reported moderate or more severe depression. There was no significant difference between the degrees of depression and moderate to severe anxiety through different professions ($p=0.480$, $p=0.384$, respectively). Somatization was significantly lower in doctors and higher in female participants ($p=0.001$). Participants with chronic diseases and ones that had a dependent relative were at higher risk for anxiety and depression.

Conclusion: Most of the healthcare workers had depression and anxiety in the beginning of the pandemic, and it was independent of gender, profession, or workplace. Healthcare professionals with chronic diseases and dependent relatives are at risk for severe depression.

Keywords: COVID-19, pediatric, anxiety, depression, healthcare workers

INTRODUCTION

The viral infection COVID-19 quickly spread all over the world after first appearing in Wuhan, the largest metropolitan city in China's Hubei Province, in late 2019 and was declared a pandemic in March 2020.^{1,2} The cooperation of all healthcare workers is essential to fight the pandemic; consequently, healthcare workers, particularly the ones caring for COVID-19 patients, carry the biggest burdens and risks. Increased workloads, physical fatigue, insufficient personal protective equipment (PPE), nosocomial contamination risk, ethically difficult decisions needed in patient care and restrictions on work hours and leave have been reported to increase the psychological burden on the physical and mental health of healthcare professionals.³ Similarly, the fear of infecting

their families and social isolation due to long shifts have contributed to healthcare workers' mental complaints.³

Several studies have reported that the mental complaints of people and particularly healthcare workers have been altered during the pandemic period.³⁻⁵ In their meta-analysis, Papa et al.³ reported that almost 23% of healthcare workers experienced anxiety, 22% suffered from depression and 34% complained of sleep disturbance during the COVID-19 pandemic. More mental complaints, particularly for healthcare workers treating COVID-19 patients, are expected. Previous studies have reported that women and nurses were more at risk for frequent psychological symptoms than other healthcare workers.^{6,7} Furthermore, healthcare workers are anxious about

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becoming infected through COVID-19 patients while doing their work.³ Regarding this concern, individuals report experiencing a variety of COVID-19-like symptoms that affect them both mentally and physically. Feeling COVID-19-like symptoms was claimed to be related to experiencing somatic situations more than normal and to catastrophically interpreting these symptoms.⁸ It can be said that studies have found that the tendency to somatization may be important regarding the anxiety experienced in relation to COVID-19.

Somatization is the perception of bodily sensations that are normal or not clearly indicating a disease in an intense, harmful and disturbing manner.⁹ For example, a tingling sensation in the throat or a runny nose may be perceived as a COVID-19 symptom. Conversely, in cases where the tendency to somatization is low, although an individual has symptoms compatible with COVID-19, the symptoms may not be strongly felt. Therefore, it is important to understand the mental complaints and their relationship with the somatization tendencies of healthcare workers during the pandemic. Differences between healthcare workers such as profession, gender or directly working in COVID-19 departments may differently affect existing mental symptoms.

In this study, we aimed to evaluate the psychological effects of the pandemic period on healthcare workers in a pediatric hospital and to reveal the risk groups in terms of depressive symptoms and anxiety.

METHODS

The study was carried out with the permission of Keçiören Training and Research Hospital Clinical Researches Ethics Committee (Date: 10.06.2020; Decision No: 2117). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki.

We invited by email 250 healthcare professionals working in our tertiary pediatric teaching hospital to participate in the study. A total of 242 people completed the study questionnaire, for a response rate of 97%. The study data were collected from June 1 to June 30, 2020, using the snowball sampling method. Participants were included if they were over 18 years old, actively working in healthcare in the hospital whether working with COVID-19 or not and have consent to participate to the study. The participants without consent and the illiterate ones were excluded from the study. Online consent was obtained from all the participants.

Participants were first asked to provide their demographic information, such as age, gender, occupation, marital and educational status, having children, having a dependent relative at home, having a chronic disease and whether they worked in COVID-19-related services. The participants were questioned about COVID-19-related symptoms,

such as fever, sore throat, cough, weakness, runny nose, nasal congestion, nausea, vomiting, diarrhea, or other symptoms. Respondents with these symptoms were asked if they thought their symptoms were related to COVID-19 and to rate their concerns between 1 and 10. Participants with symptoms were also asked how they responded when the symptoms occurred and whether they thought the symptoms could be psychological.

Participants were then asked to complete three different scales: the Patient Health Questionnaire 9 (PHQ-9) to evaluate their level of depression, the General Anxiety Disorder 7 (GAD-7) for anxiety assessment, and the Somatosensory Amplification Scale (SSAS) to assess their level of exaggeration of sensations. All these scales were in Turkish, and their Turkish translations have all been validated.¹⁰⁻¹²

PHQ-9 (Patient Health Questionnaire)

This is a nine-question depression module derived from the original PHQ scale. If a participant marks “more than half of the day” for five or more of the nine depressive symptom questions or indicates a depressive mood or anhedonia (inability to enjoy doing something), it is considered severe depression. Each item is scored on a four-point Likert scale: 0, never; 1, some days; 2, more than half of the days; and 3, almost every day. Total scores for the PHQ-9 scale can be between 0 and 27; answers to each question are scored from 0 to 3 points. A total score between 1 to 4 is the minimum result, between 5 to 9 indicates mild depression, between 10 to 14 reflects moderate depression, between 15 to 19 implies partially severe depression and between 20 to 27 is considered severe depression.

GAD-7 (General Anxiety Disorder)

This test developed according to DSM-IV criteria (Diagnostic and Statistical Manual of Mental Disorders) can be easily applied to evaluate a generalized anxiety disorder. It consists of seven questions evaluating the respondent's experiences over the last two weeks and uses a four-point Likert scale (0= none, 1=many days, 2=more than half of the days and 3=almost every day) to score the answers. A total score of 0 to 4=mild, 5 to 9=moderate, 10 to 14=high and 15 to 21=severe anxiety. When a total score threshold of 10 was chosen, the test's sensitivity for the diagnosis of GAD was found to be 89% and its specificity 82%.¹³

N-SSAS (Somatosensory Amplification Scale)

N-SSAS is a self-assessment scale developed to measure the augmentation/exaggeration that people use while somatizing. This 10-item scale with proven validity and reliability was developed by Barsky et al.¹⁴ Patients score each item between 1 and 5. A total amplification score is obtained by summing the scores from the items.

Statistical Analysis

A statistical analysis was performed with SPSS 20.0 for Windows (IBM SPSS Inc., NY USA). According to the analysis of 95% confidence (1-α), 95% test strength (1-β) and d=0.5 effect size, the number of samples to be taken was determined as minimum of 150 samples in power analysis. We used a Shapiro-Wilk test to assess the normal distribution of the data. Continuous variables were expressed as the mean and standard derivations, and categorical variables such as gender were summarized as frequencies and percentages. The depression and anxiety scores were categorized according to cut-off scores, and groups for sociodemographic and other categorical parameters associated with COVID-19 were compared with a chi-squared test. Any p-values less than 0.05 were considered significant.

RESULTS

General Characteristics of the Study Population

Of the 242 participants, 147 were women and 95 were men. The mean age of the participants was 31.6±8.1; 193 were younger than 40 years old, and 49 were 40 years or older. Regarding marital status, 126 were married, 109 were single and 7 were divorced. Almost half of the participants (105 of 242) had one or more children, and 62 had a dependent relative at home. While 34 participants suffered from a chronic disease, 208 stated that they were completely healthy. The education levels of the participants were as follows: 103 (42.6%) participants had a master’s degree, 129 (53.3%) had a bachelor’s degree and 10 (4.1%) were high school or below graduates. Of the 242 participants 108 were doctors, 82 were nurses and 52 were other medical staff. There were 117 participants working

in a service related to COVID-19 and 122 working in non-COVID-19 services (Table 1).

During the study period, 76 (31.9%) participants experienced no symptoms, 60 (25.2%) had one symptom, and 102 (42.9%) had more than one symptom. The most common symptoms were fever and sore throat. The symptoms were considered psychological by 122 participants, while 49 believed them to be real. Of the participants, 119 (49%) were worried about having COVID-19; their mean anxiety score was 2.65±2.6. Of those who exhibited symptoms, 19 (8%) ignored the symptoms, 78 (32%) waited to see if their symptoms would continue, 8 (4%) called a doctor friend and 6 (2.4%) were admitted to a hospital.

Comparison of neuropsychological features

Approximately 29% of the participants had moderate or severe anxiety and 49% had moderate or more severe depression during the pandemic period. Moderate to severe anxiety was detected in 32% of the doctors, 31% of the nurses and 22% of the other medical staff (p=0.384). Approximately 16% of the doctors had no depression, 61% had mild to moderate depression and 23% had severe depression. On the other hand, 31% of the nurses and 20% of the other healthcare personnel had severe depression. There was no significant difference between the degrees of depression in different professions (p=0.480). While 31.5% of the women who participated in the survey had moderate to severe anxiety, only 25% of the men did (p=0.765). Severe depression rates were 28% and 18% in men and women, respectively. Of the severely depressed woman participants, 51% were nurses, 40% were doctors and 9% were assistant health personnel (Figure 1).

	Doctors (n=108)	Nurses (n=82)	Other Medical Staff (n=52)	p	COVID workers (n=117)	None COVID workers (n=122)	p	Total (n=242)
	n (%)	n (%)	n (%)		n (%)	n (%)		n (%)
Age								
<40 years	96(89)	69(84)	28(54)	<0.001	93(80)	99(81)	0,747	193 (80)
≥40 years	12(11)	13(16)	24(46)		24(20)	23(19)		49 (20)
Gender								
Female	64(59)	66(81)	17(33)	<0.001	69(59)	78(64)	0,431	95 (39)
Male	44(41)	16(19)	35(67)		48(41)	44(36)		147 (61)
Education								
Master	103(95)	0	0	<0.001	54(46)	49(40)	0,363	103 (43)
Bachelors	5(5)	82(100)	42(81)		60(51)	66(54)		129 (53)
High School or below	0	0	10(19)		3(3)	7(6)		10 (4)
Marital Status								
Single	52(48)	48(59)	9(17)	<0.001	52(44)	57(47)	0,871	109 (45)
Married	56(52)	31(38)	39(75)		62(53)	61(50)		126 (52)
Other	0	3(4)	4(8)		(3)	4(3)		7 (3)
Fertility								
One or more children	37(34)	29(35)	39(75)	<0.001	50(43)	52(43)	0,986	105 (43)
No children	71(66)	53(65)	13(25)		67(57)	70(57)		137 (57)

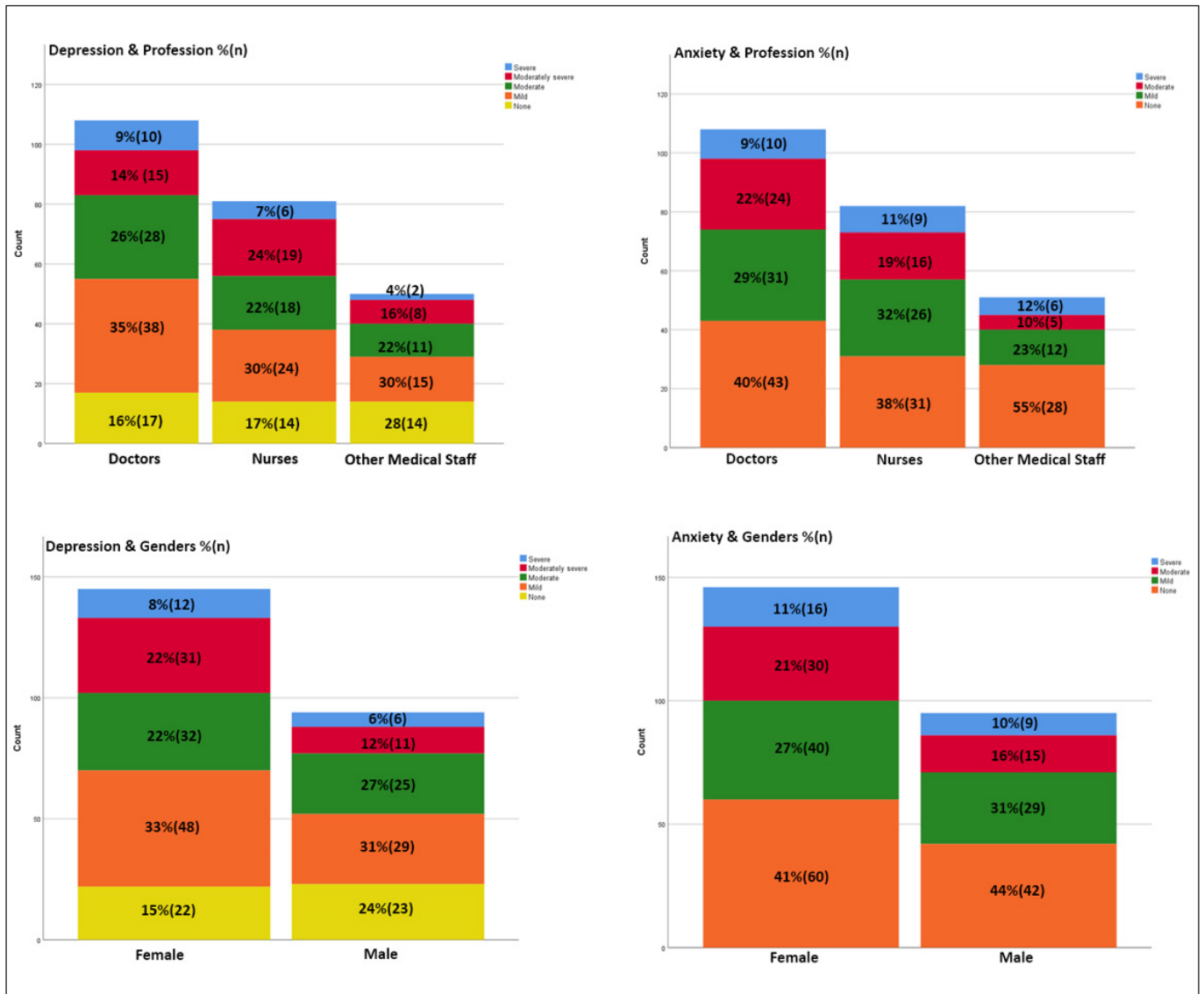


Figure 1. Proportions of the severity of depression and anxiety through the profession and gender of the participants

In total, 62 of the participants (26%) had a chronic illness, and 34 (14%) of them had a relative in need of home care. The depression, anxiety and somatization scores of the participants who had dependent relatives at home were significantly higher than those who did not (Table 2). In addition, while the depression levels of the participants with a chronic illness were significantly higher than those without a chronic illness, their anxiety and somatization evaluations were similar (Table 3).

Table 2. Comparison of PHQ-9, GAD-7, and N-SSAS Scores between participants with or without dependent relative

	Participants with dependent relative		Participants without dependent relative		Statistics	
	Mean	SD	Mean	SD	t	p
PHQ-9	11.98	6.50	9.41	5.81	-2.738	0.007
GAD-7	8.84	5.71	6.90	5.29	-2.345	0.021
N-SSAS	29.66	6.75	27.04	6.95	-2.591	0.011

PHQ-9: Patient Health Questionnaire-9, GAD-7: General Anxiety Disorder-7, N-SSAS: Somatosensory Amplification Scale

Table 3. Comparison of PHQ-9, GAD-7, and N-SSAS Scores between participants with or without chronic disease

	Participants with chronic disease		Participants without chronic disease		Statistics	
	Mean	SD	Mean	SD	t	p
PHQ-9	12.62	6.56	9.64	5.91	-2.672	0.008
GAD-7	8.91	5.61	7.15	5.40	-1.752	0.081
N-SSAS	20.09	6.56	27.48	7.03	-1.247	0.214

PHQ-9: Patient Health Questionnaire-9, GAD-7: General Anxiety Disorder-7, N-SSAS: Somatosensory Amplification Scale

Somatization was significantly lower in doctors than in other healthcare workers (nurses and staff) (p= 0.04). The participants with high somatization had significantly higher depression (p<0.001) and anxiety (p<0.001) rates. In addition, somatization was significantly higher in female participants (p=0.001).

DISCUSSION

The anxiety and depression levels of healthcare professionals of a tertiary pediatric hospital that provides diagnosis and treatment services to COVID-19 patients were assessed in this study. The most important findings in the study were that approximately half of the healthcare workers had depressive symptoms and that 30% had anxiety during this period. Moreover, depressive symptoms and anxiety did not differ by profession (doctors, nurses, or medical staff), age, gender, marital status, having children and education level. Anxiety and depressive symptoms were significantly higher in healthcare workers who had a chronic disease or a dependent relative at home. Another important finding of our study was that the medical staff and nurses had higher somatization compared to doctors.

Studies investigating the effects of the pandemic period on healthcare workers have shown that gender, occupation, workplace, and several social factors increase their stress, anxiety, and depressive symptoms. It has also been reported that the pandemic period is an independent risk factor for stress in healthcare workers.⁴ Unsurprisingly, a significant portion of the healthcare professionals participating in our study reported depressive symptoms and anxiety. In particular, healthcare workers with chronic disorders and those with a dependent relative at home had significantly higher anxiety and depressive symptoms. COVID-19 is reported to be more severe in patients of advanced age and with comorbid diseases.¹⁵ In addition, healthcare workers reported having serious concerns about infecting their families or colleagues during the pandemic.^{16,17} This concern may explain the higher anxiety and depressive symptoms of the participants with chronic diseases or a dependent relative in this study.

It is known that women have more anxiety than men.¹⁸ In addition, studies have shown that female healthcare workers are experiencing higher anxiety and depressive symptoms during the pandemic period.³ In this study, although higher anxiety and depressive symptoms were found in females, no significant increase in these symptoms was found compared to their male colleagues. It has also been reported that, during the pandemic, anxiety and depressive symptoms were higher in doctors and those with a high level of education.¹⁹ This has been attributed to their workload and their need for more frequent travel. However, we observed no significant relationship between education level and profession with anxiety and depressive symptoms in this study. Most healthcare workers have had to stay at home like any other citizen, as well as having had to be more engaged in other aspects of life, such as the health of family members or family income. In addition, in Turkey, nurses and

medical staff have had to work under similar stresses and conditions during the pandemic period. It was an important finding of our study that this situation created a similar anxiety in all healthcare providers, regardless of their profession.

A recent study reported the anxiety and depressive symptoms of healthcare workers in a children's hospital in China, where the pandemic started. The authors reported that self-reported depression and anxiety were significantly higher in employees compared to the ordinary population.²⁰ They concluded that pediatricians working in departments related to COVID-19 should be given more psychological support during the pandemic period. Similarly, the anxiety and the depressive symptoms of the doctors, nurses and healthcare staff working in the tertiary children's hospital in our study were all markedly high. That there are similar results between the two countries may indicate that this situation affects all healthcare workers globally during the pandemic period.

Another important finding in our study was that the nurses and healthcare staff had more somatization than doctors. It is known that somatization decreases with the increase of cognitive skills,²¹ which may explain the doctors' lower somatization. Contrary to our study, Lung et al.²² reported more somatic symptoms in physicians than in other healthcare professionals. They attributed the difference to the different stress levels of jobs and gender, as well as to cultural and behavioral patterns. Due to differences in cultural and working conditions, physicians may have reported less somatic symptoms in our study, but it could also indicate that doctors may have been demonstrating less concern about symptoms related to COVID-19. Hence, this study suggests that doctors should be more careful concerning their personal symptoms.

Limitations

The major limitation of our study was that the participants did not record the number of hours they worked and that the participants were grouped according to their occupations. There are differences in the weekly working hours of different professions, which may affect the psychological status of the participants. In addition, other limitations of the study can be the relatively small sample size, the use of single item ratings, potential choice bias and the lack of knowledge about workload.

CONCLUSION

Depression and anxiety are common among healthcare providers working under severe conditions due to the COVID-19 pandemic, independent of their gender and profession. In particular, healthcare workers who have chronic illnesses or have dependent relatives at home are

at risk of severe depression and anxiety. These workers should thus be closely monitored as a high-risk group for depression and anxiety. Working conditions for treating COVID-19 patients should be regulated or appropriate psychological support should be provided for those who are at risk for severe depression and anxiety.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of Keçiören Training and Research Hospital Clinical Researches Ethics Committee (Date: 10.06.2020; Decision No: 2117).

Informed Consent: All patients signed the free and informed consent form.

Referee Evaluation Process: Externally peer reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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