

EVALUATION OF DEPRESSION, ANXIETY AND STRESS LEVELS OF HEALTHCARE WORKERS DURING THE COVID-19 PANDEMIC IN TURKEY

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ABSTRACT

Objective: The novel coronavirus disease 2019 (COVID-19) pandemic has affected all over the world in many areas such as health, economy, sociology, psychology, and education. Healthcare workers (HCWs), who are at the forefront in the fight against the pandemic, are adversely affected both physically and mentally. The aim of our study was to evaluate the relationship between depression, anxiety and stress levels of HCWs during the COVID-19 pandemic.

Material and Method: In our study, which is a quantitative research, an online questionnaire was applied to collect data. An online survey was administered for data collection. Whether the average scores obtained in line with the answers given by the participants to the scale differed according to the demographic variables of the participants were analyzed.

Results: The depression, anxiety and stress levels of HCWs were found to be high. There were significant differences between the depression, anxiety and stress levels of HCWs and their demographic characteristics. The levels of depression, anxiety, and stress was higher in women than in males, higher in singles than in married individuals, more prevalent in younger individuals than in middle-aged and older ones, and more prevalent in high school and associate's degree holders than in master and doctorate holders. Nurses had higher levels of depression, anxiety and stress compared to physicians.

Conclusion: Our study results suggest that depression, anxiety and stress levels of HCWs are high.

Keywords: COVID-19, depression, anxiety, stress, healthcare workers.

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COVID-19 PANDEMİSİ DÖNEMİNDE TÜRKİYE'DEKİ SAĞLIK ÇALIŞANLARININ DEPRESYON, ANKSİYETE VE STRES DÜZEYLERİNİN DEĞERLENDİRİLMESİ

ÖZET

Amaç: Yeni koronavirüs hastalığı 2019 (COVID-19) pandemisi tüm dünyada sağlık, ekonomi, sosyoloji, psikoloji, eğitim gibi birçok alanı etkisi altına almıştır. Pandemi ile mücadelede en ön saflarda yer alan sağlık çalışanları hem fiziksel hem de ruhsal olarak olumsuz etkilenmiştir. Çalışmamızın amacı COVID-19 pandemisi sırasında sağlık çalışanlarının depresyon, anksiyete ve stres düzeyleri arasındaki ilişkilerin belirlenmesidir.

Materyal ve Metot: Nicel bir araştırma olan çalışmada, veri toplamak amacıyla online anket formu kullanılmıştır. Katılımcıların ölçeklere verdikleri

cevaplar doğrultusunda elde edilen ortalama puanların katılımcıların demografik değişkenlerine göre farklılık gösterip göstermediği incelenmiştir.

Bulgular: Sağlık çalışanlarının depresyon, anksiyete ve stres düzeyleri yüksek bulunmuştur. Ayrıca sağlık çalışanlarının depresyon, anksiyete ve stres düzeyleri ile demografik özellikleri arasında anlamlı farklılık olduğu tespit edilmiştir. Depresyon, anksiyete ve stres hemşirelerde doktorlara göre, kadınlarda erkeklere göre, bekarlarda evlilere göre, gençlerde orta ve ileri yaştakilere göre, lise ve önlisans mezunlarında lisans ve doktora mezunlarına göre daha sık görülmektedir.

Sonuç: Çalışma sonuçlarımız COVID-19 döneminde sağlık çalışanlarının depresyon, anksiyete ve stres düzeylerinin yüksek olduğunu göstermektedir.

Anahtar kelimeler: COVID-19, depresyon, anksiyete, stres, sağlık çalışanları.

INTRODUCTION

A global pandemic known as the novel coronavirus disease 2019 (COVID-19) infection first appeared in Wuhan, China in December 2019. According to the World Health Organization (WHO) report, as of August 21st, 2022, 593 million confirmed cases and 6.4 million deaths have been reported globally.¹ The COVID-19 infection, for which we still do not have a prediction as to when it would cease, continues to have an impact all over the world by adjusting to the conditions, reaching a peak or a wave at various periods and in various geographic locations, and passing through mutations.

The negative effects of the COVID-19 pandemic are seen in many areas such as economy, sociology, psychology, education, particularly the healthcare system. The extent of this adverse effect is growing daily and is worrisome. The disease burden is also unequally divided among social classes. Afro-Americans account for a disproportionately high proportion of COVID-19 deaths in the United States (US) compared to the general population. According to data from researches carried out in the US and Europe, as with many other diseases, the poor, deprived, immigrants, and asylum seekers are more likely to have this illness.^{2,3} Both the reports released by the Confederation of Progressive Trade Unions of Turkey (DİSK) and Republic of Turkey, Ministry of Health demonstrate that the burden of the disease is greater among employees and healthcare workers (HCWs).^{4,5}

The Turkish Thoracic Society have investigated the prevalence of COVID-19 infection in their survey, which is part of their on going investigation of the danger of HCWs being infected with the virus since the start of the pandemic. The rate of COVID-19 infection among HCWs grew considerably from 12.1% in the June-July 2020 period to 57.4% in the December 2020-January 2021 period, according to the survey data collected over two separate time periods.⁶ According to the report of WHO in the first months of the pandemic, 14% of COVID-19 cases worldwide were among HCWs.⁷ According to the WHO 25th-week report on the situation in Europe, 21% of reported COVID-19 cases were among HCWs.⁸ Turkish Medical Association in the 6th Month Evaluation Report of COVID-19 has been reported that the healthcare worker/general society COVID-19 case rate is 8.56 percent.⁹

Undoubtedly, one of the groups most susceptible to harmful impacts, both physically and mentally, is the healthcare work force, which is at the frontline of the fight against the pandemic. The mental health of HCWs has been negatively affected as a result of their involvement in the diagnosis, treatment, and monitoring phases of COVID-19 disease. This is because they are afraid of becoming infected, spreading the disease, contracting it, or evending during the entire process. Several studies have shown that a significant portion of HCWs experience burnout, emotional issues or stress even during normal times, while a larger portion of HCWs experience depression, anxiety, stress, insomnia, anxiety, and burnout during the pandemic.¹⁰⁻¹³ Stress of HCWs who struggle to protect both themselves

Study population	100	500	750	1,000	2,500	5,000	10,000	25,000	50,000	100,000	1,000,000	100,000,000
Sample size	80	217	254	278	333	357	370	378	381	383	384	384

	n	%
Sex		
Male	326	22.7
Female	1109	77.3
Age		
Aged 18-25	890	62.0
Aged 26-35	324	22.6
Aged 36-45	125	8.7
Aged 46-55	74	5.2
55 and above	22	1.5
Marital Status		
Married	444	30.9
Single	991	69.1
Education Level		
Highschool	160	11.1
Associate Degree	617	43.0
Bachelor Degree	477	33.2
Master Degree	87	6.1
Doctorate Degree	94	6.6
Position/ Title		
Physician	128	8.9
Nurse	544	37.9
Health technician	587	40.9
Administrative staff	127	8.9
Other Employees	49	3.4
Total	1435	100.0

and their patients following pandemic measures has adversely affected their work and private lives. They had to keep the risk of contamination to themselves, the patients they cared for, and their families under control, particularly while working. The main causes of mental problems among HCWs include difficult working conditions, such as isolation, working in high-risk regions, and coming in to touch within infectious persons.¹⁴

The health of every person is threatened by COVID-19 infection, which is still rapidly spreading around the world and in our country, it is still unclear when it will end. The infection, itself, is also associated with mental health issues. In the present study, we hypothesized that HCWs working at the frontline could be at a higher risk for physical and mental issues. We, therefore, aimed to investigate the possible relationship between the levels of depression, anxiety, and stress experienced by HCWs during the COVID-19 pandemic and to

analyze whether there were any differences between the COVID-19 infection states, demographic features, stress levels, and depression, and anxiety levels of HCWs with the purpose of providing additional information to the body of knowledge on this subject.

MATERIAL AND METHOD

Study Design and Study Population

The study scope included every healthcare facility operating in Turkey. According to the data of the Republic of Turkey, Ministry of Health, the number of HCWs working as of 2021, when the study was conducted, was 700 144.¹⁵ The targeted population was the all healthcare workers in Turkey. The data of the study, which is a cross-sectional study, were collected for a three-month period (October, November, December 2021). A total of 1435 questionnaires responded during this three-month period were considered the study sample. In accordance with the scope of the study, the simple random sampling, which is one of the probability sampling methods, was used to generalize the results to the study population on a voluntary basis. The sample size was calculated as described by Yazıcıoğlu and Erdoğan with 0.95 reliability and 0.05 sampling error according to Table 1.¹⁶ As shown in the Table 1, a sample size of 384 individuals may represent a study population of 100 million individuals. Based on these findings, a sample size of 1435 participants included in our study was adequate to represent the study population.

An online questionnaire was used for data collection via social media platforms in our study, allowing voluntary participation of each participant. Considering that contact with healthcare workers via individual and/or institutional e-mail addresses would be difficult during the pandemic and such a contact would be inconvenient and impose obligation, the questionnaire was applied via social media platforms based on voluntary basis. In addition, the questionnaire was filled out once for each participant and repeated submissions were prevented limiting the form submission via the relevant link. This study was approved by the Uskudar University Ethics Committee with the Approval No: 61351342.

Data Collection Tool

An online survey was used for data collection in the study. Data were collected from HCWs working in all regions of Turkey by convenience sampling method. The survey form consisted of two parts. The participants were questioned about their age, sex, marital status, education status, employment status,

COVID-19 status, and vaccination history in the first part of the survey. The Depression Anxiety Stress Scale (DASS-42), developed by Lovibond and Lovibond in 1995, was included in the second part.¹⁷ The original scale has 42 items and three dimensions (depression, anxiety and stress). According to Brown *et al.*, the shorter forms of this scale were valid for performing the same measurement.¹⁸ Henry and Crawford and Mahmoud *et al.* modified the scale and developed the 21-item Depression Anxiety Stress Scale (DASS-21) which was applied in our study.^{19,20} The terms utilized in the validity and reliability studies by Nazan and Bilgel and Akin and Çetin were used for the Turkish expressions of the DASS-21 scale.^{21,22} Saricam examined the psychometric characteristics of the Turkish DASS-21 scale in normal and clinical samples.²³ A four-point Likert scale was used: there responses "not suitable for me," "slightly suitable for me," "generally suitable for me," and "totally suitable for me" were classified as 0, 1, 2, and 3, respectively. Receiving 5 or more from the depression sub-dimension, 4 or more from the anxiety sub-dimension, and 8 or more from the stress sub-dimension on the scale, which comprises seven items to measure the dimensions of depression, stress, and anxiety, denotes the presence of an associated issue.

Data Collection and Analysis

Data for the study were collected through an online survey method. Statistical analysis was performed using the SPSS version 22.0 software (IBM Corp., Armonk, NY, USA). Normality analysis was carried out before to the data analysis to choose the analysis approach (parametric or non-parametric). Since the skewness coefficient (0.153) and kurtosis coefficient (-0.43) of the DASS-21 scale were between -1 and +1, the data were assumed to be normally distributed and parametric tests were employed to analyze the data.²⁴ Following a normality check, t-tests and analysis of variance (ANOVA) were used to examine whether the average scores obtained in accordance with the responses provided by the participants to the DASS-21 scale varied by the participants' age, sex, marital status, education status, employment status, COVID-19 status, and vaccination status. In addition, Post Hoc Tukey test was used to detect significant groups when comparing more than two groups. The Cronbach's alpha coefficients were also analyzed to identify the degree of reliability of the DASS-21. The total of Cronbach's alpha coefficients of the DASS-21 scale was calculated as 0.838. The Cronbach's alpha coefficients for the sub-dimensions of the scale were determined to be 0.777 for depression, 0.804 for anxiety, and 0.741 for stress. A *p* value of <0.05 was considered statistically significant.

RESULTS

The demographic characteristics of the HCWs included in the study are given in Table 2.

COVID-19-Related Issues of Healthcare Workers

Figure 1 depicts the results of statistical analysis of the COVID-19 infection and the level of immunization among healthcare workers (HCWs). Accordingly, 43% of HCWs had COVID-19 disease, only 5% of them required hospitalization, 90% of HCWs had the COVID-19 vaccine, and family members of 50% of HCWs had COVID-19 infection.

Depression, Anxiety and Stress Levels of Healthcare Workers

The distribution of depression, anxiety, and stress levels of healthcare workers (HCWs) is shown in Figure 2. The participants scores on each sub-dimension of the DASS-21 scale were used to determine the participants levels of depression, anxiety and stress. According to the scale scoring criteria, a score of 0-4 in the depression dimension indicates normal, 5-6 points mild, 7-10 points moderate, 11-13 points severe, 14 points and above very severe depression. A score of 0-3 on the anxiety dimension indicates normal, 4-5 points mild, 6-7 moderate, 8-9 severe, 10 and above very severe anxiety. A score of 0-7 on the stress dimension indicates normal, 8-9 points mild, 10-12 points moderate, 13-16 points severe, and 17 and above points very severe stress. According to Figure 2, 10.6% (n=152) of the HCWs who participated in the study had a normal

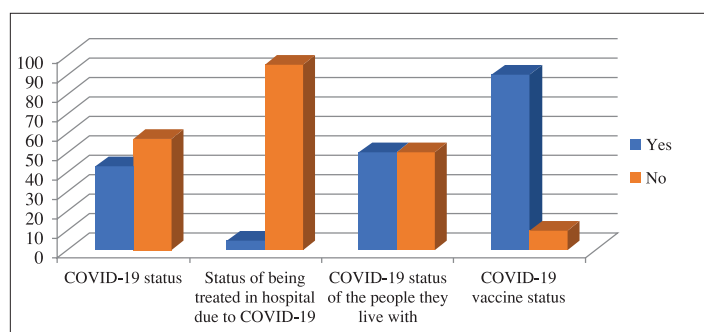


Figure 1. Distribution of HCWs' conditions related to COVID-19

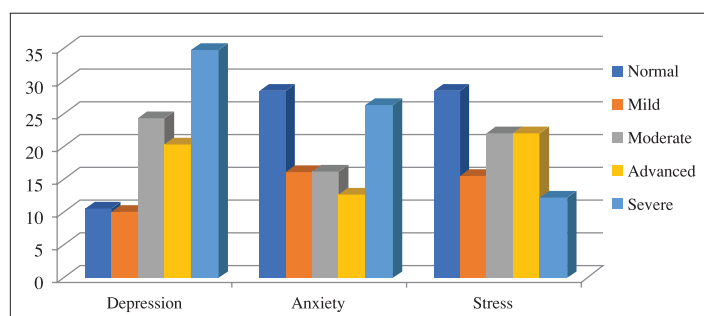


Figure 2. Depression, anxiety and stress levels of HCWs during the COVID-19 pandemic

Table 3. Demographic Characteristics of Healthcare Workers

	Sex	n	Mean	SD	t	p
Depression	Male	326	10.08	5.64	-4.276	p<0.001
	Female	1109	11.49	5.11		
Anxiety	Male	326	5.33	4.73	-6.154	p<0.001
	Female	1109	7.09	4.50		
Stress	Male	326	9.25	5.12	-5.431	p<0.001
	Female	1109	10.89	4.67		

SD: Standart deviation

Depression, Anxiety and Stress Levels According to Sex

A t-test was conducted to test whether the depression, anxiety, and stress levels of the participants differed according to their sex (Table 3). As a result, depression, anxiety, and stress levels of HCWs differed significantly according to their sex ($p<0.05$). The depression, anxiety, and stress levels were higher in females than males.

Depression, Anxiety and Stress Levels According to Marital Status

A t-test was conducted to test whether the depression, anxiety, and stress levels of the participants differed according to their marital status (Table 4). As a result depression, anxiety, and stress levels of HCWs differed significantly according to their marital status ($p<0.05$). The depression, anxiety, and stress levels of the singles were higher than married HCWs.

Table 4. Depression, Stress and Anxiety Levels of Healthcare Workers by Marital Status

	Marital Status	n	Mean	SD	t	p
Depression	Married	444	9.95	5.47	-5.901	p<0.001
	Single	991	11.7	5.08		
Anxiety	Married	444	6.24	4.56	-2.454	0.01
	Single	991	6.88	4.61		
Stress	Married	444	9.57	4.83	-4.976	p<0.001
	Single	991	10.9	4.76		

SD: Standart deviation

Depression, Anxiety and Stress Levels According to Age

The ANOVA test was carried out to determine whether the depression, anxiety, and stress levels of HCWs differed according to their age (Table 5). As a result, the depression, anxiety, and stress levels of the HCWs differed significantly according to their age ($p<0.05$). The Tukey test, which was conducted to identify the groups that created the significant difference, revealed that the significant difference was between the 18-25 age group and the 36-45 age group, the 46-55 age group, and the over 55 age group. Accordingly, the depression, anxiety and stress levels of the HCWs in the 18-25 age group were significantly higher than those of the 36-45 age group, 46-55 age group, and 56 and over age group. The depression, anxiety, and stress levels of the young HCWs were higher than the middle and older HCWs.

Table 5. Depression, stress and anxiety levels of healthcare workers by age

	Age	n	Mean	SD	F	p	Tukey
Depression	Aged 18-25(1)	890	11.99	5.07	42.922	p<0.001	1-3
	Aged 26-35(2)	324	11.63	5.02			1-4
	Aged 36-45(3)	125	7.26	4.45			1-5
	Aged 46-55(4)	74	7.46	4.86			
	Aged 55 and above(5)	22	5.68	3.94			
Anxiety	Aged 18-25(1)	890	7.12	4.55	21.823	p<0.001	1-3
	Aged 26-35(2)	324	7.26	4.74			1-4
	Aged 36-45(3)	125	4.18	3.81			1-5
	Aged 46-55(4)	74	4.16	3.70			
	Aged 55 and above(5)	22	3.50	3.20			
Stress	Aged 18-25(1)	890	11.31	4.72	33.508	p<0.001	1-3
	Aged 26-35(2)	324	10.53	4.69			1-4
	Aged 36-45(3)	125	7.59	4.25			1-5
	Aged 46-55(4)	74	7.35	3.99			
	Aged 55 and above(5)	22	5.77	3.19			

SD: Standart deviation

Depression, Anxiety and Stress Levels According to Education Status

The ANOVA test was carried out to determine whether the depression, anxiety, and stress levels of HCWs differed according to their education status (Table 6). As a result, the levels of depression, anxiety, and stress of HCWs differed significantly ($p<0.05$). Based on the Tukey test, there was a significant difference between high school and associate degree graduates and master degree and doctorate degree graduates. Accordingly, the depression levels of high school graduates HCWs were significantly higher than the depression levels of master and doctorate graduate HCWs. In addition,

level of depression, 10% (n=144) had mild depression, 24.3% (n=348) had moderate depression, 20.3% (n=292) had severe depression, and 34.8% (n=499) had very severe depression. According to anxiety levels, 28.5% (n=109) had a normal level of anxiety, 16.1% (n=231) had mild, 16.2% (n=232) moderate, 12.8% (n=184) severe, and 26.4% (n=379) verysevere anxiety. In terms of stress levels, 28.4% (n=407) had normal stress levels, 15.5% (n=222) had mild, 22% (n=316) moderate, 22% (n=315) severe, and 12.2% very severe stress levels.

the anxiety levels of the high school degree HCWs were higher than the anxiety levels of the associate degree, master degree, and doctorate degree graduates. The anxiety levels of the bachelor degree graduates were higher than the anxiety levels of the master and doctorate graduates. Additionally, the stress levels of highschool degree participants were found to be higher than the stress levels of bachelor degree, master degree, and doctorate degree graduates. The stress levels of the associate degree graduates were higher than the stress levels of the graduate and doctorate graduates. Taken together, the depression, anxiety, and stress levels of high school and associate degree graduates were higher than those of post-graduate and doctoral graduate HCWs.

Depression, Anxiety and Stress Levels According to Employment

The ANOVA test was carried out to determine whether the depression, anxiety, and stress levels of HCWs differed according to their employment status (Table 7). As a result, there was a significant difference in the levels of depression, anxiety, and stress of HCWs according to their employment status ($p < 0.05$). The Tukey test revealed a significant difference between medical workers and nurses, medical technicians, office staff, and other workers. The depression, anxiety, and stress levels of physicians were significantly lower than nurses, medical technicians, office staff, and other workers. Accordingly, nurses, medical technicians, office staff, and other workers had higher levels of depression, anxiety and stress than physicians.

Depression, Anxiety and Stress Levels According to the COVID-19 Disease Status

The t-test was conducted to determine whether the depression, anxiety, and stress levels of HCWs differed according to their COVID-19 disease status (Table 8). As a result, the levels of stress of HCWs were not statistically significantly different from one other according to the COVID-19 disease status, while the levels of depression and anxiety were significantly different ($p < 0.05$). Accordingly, HCWs infected with COVID-19 had higher levels of depression and anxiety than those without COVID-19.

Depression, Anxiety and Stress Levels According to Vaccination Status

The t-test was conducted to determine whether the depression, anxiety, and stress levels of HCWs differed according to their vaccination status (Table 9). As a result, there was a statistically significant relationship

Table 6. Depression, stress and anxiety levels of healthcare workers by education status

	Education Status	n	Mean	SD	F	p	Tukey
Depression	High School(1)	160	12.51	5.41	32.160	$p < 0.001$	1-4
	Associate Degree(2)	617	11.78	5.03			1-5
	Bachelor Degree(3)	477	11.38	5.12			
	Master Degree(4)	87	8.06	4.67			
	Doctorate Degree(5)	94	6.67	4.51			
Anxiety	High School(1)	160	8.11	4.73	23.546	$p < 0.001$	1-2
	Associate Degree(2)	617	6.84	4.44			1-4
	Bachelor Degree(3)	477	7.03	4.66			1-5
	Master Degree(4)	87	5.10	4.25			3-4
	Doctorate Degree(5)	94	3.01	3.26			3-5
Stress	High School(1)	160	11.85	5.11	21.087	$p < 0.001$	1-3
	Associate Degree(2)	617	11.04	4.64			1-4
	Bachelor Degree(3)	477	10.43	4.79			1-5
	Master Degree(4)	87	8.33	4.52			2-4
	Doctorate Degree(5)	94	7.28	3.90			2-5

SD: Standart deviation

Table 7. Depression, stress and anxiety levels of healthcare workers by employment

	Status	n	Mean	SD	F	p	Tukey
Depression	Physician (1)	128	6.71	4.46	32.460	$p < 0.001$	2-1
	Nurse (2)	544	11.90	5.01			3-1
	Medical Technician (3)	587	11.81	5.12			4-1
	Office Staff (4)	127	10.00	5.42			5-1
	Other Workers (5)	49	10.02	5.06			
Anxiety	Physician (1)	128	3.24	3.56	24.223	$p < 0.001$	2-1
	Nurse (2)	544	7.53	4.57			3-1
	Medical Technician (3)	587	6.74	4.46			4-1
	Office Staff (4)	127	6.56	4.86			5-1
	Other Workers (5)	49	6.04	4.39			
Stress	Physician (1)	128	7.36	3.98	16.619	$p < 0.001$	2-1
	Nurse (2)	544	10.91	4.76			3-1
	Medical Technician (3)	587	10.92	4.69			4-1
	Office Staff (4)	127	10.09	5.14			5-1
	Other Workers (5)	49	10.65	5.36			

SD: Standart deviation

between the depression and stress levels of HCWs and their COVID-19 vaccination status ($p < 0.05$), although it did not reach statistical significance for anxiety levels ($p > 0.05$). Accordingly, those who received the COVID-19 vaccine had higher levels of depression and stress than those who did not.

DISCUSSION

In the present study, we investigated the possible relationship between the levels of depression, anxiety, and stress experienced by HCWs during the COVID-19 pandemic. Our study results showed that the depression, anxiety, and stress levels of HCWs were high. Additionally, we found a significant relationship

Table 8. Depression, anxiety and stress levels of healthcare workers by COVID-19 status

	Covid-19 Status	n	Mean	SD	t	p
Depression	Yes	617	11.61	5.15	-2.763	0.006
	No	818	10.83	5.33		
Anxiety	Yes	617	7.87	4.56	-8.614	p<0.001
	No	818	5.80	4.44		
Stress	Yes	617	10.76	4.73	-1.687	0.092
	No	818	10.33	4.89		

SD: Standard deviation

Table 9. Depression, stress and anxiety levels of healthcare workers by vaccination status

	Covid-19 Vaccine Status	n	Mean	SD	t	p
Depression	Yes	1278	11.28	5.21	2.270	0.023
	No	157	10.27	5.62		
Anxiety	Yes	1278	6.75	4.59	1.342	0.180
	No	157	6.22	4.78		
Stress	Yes	1278	10.62	4.78	2.235	0.026
	No	157	9.71	5.09		

SD: Standard deviation

between the levels of stress, anxiety, and depression of HCWs and their demographic traits. The levels of depression, anxiety, and stress was higher in female than males, higher in singles than married HCWs, more prevalent in younger HCWs than middle-aged and older HCWs, and more prevalent in high school and associate degree holders than master and doctorate holders. Also, nurses had higher levels of depression, anxiety, and stress compared to physicians. Compared to HCWs who were not infected with COVID-19, those having COVID-19 had higher levels of depression and anxiety; however, there was no significant difference in the stress level during the pandemic. Moreover, those who received the COVID-19 vaccination had higher levels of stress and depression than those who did not, while their anxiety levels remained unchanged.

In the current study, nurses had a statistically significantly higher level of depression, anxiety and stress compared to physicians and female HCWs had a higher level of depression, anxiety and stress levels compared to male ones. This finding demonstrates that, as nurses are disproportionately female and have greater patient interaction than other HCWs, there is a larger risk of transmission and, consequently, mental health issues. Furthermore, in our study, HCWs with low education status and younger ones had statistically significantly higher levels of stress, anxiety and depression. This finding indicates that less-experienced, young HCWs may be more distressed mentally due to the lack of previous experience on problems brought by the pandemic. According to the marital status, the depression, anxiety and stress levels

of single HCWs were statistically significantly higher than those of married ones. This finding indicates that single HCWs lack emotional and social support.

These results are consistent with the researches examining the mental health status of HCWs during the COVID-19 pandemic. According to a cross-sectional study conducted in China, the symptoms of depression, anxiety and insomnia were higher in nurses, female HCWs, and frontline HCWs having a direct contact with patients, such as treatment and care.²⁵ According to a cross-sectional study conducted in Italy during the COVID-19 pandemic, significant mental health problems were reported, particularly in young HCWs, female HCWs and frontline HCWs.¹⁰ According to the results of a similar study conducted in China, anxiety, depression, insomnia, and general psychological problems were common in nurses, who were mostly women more sensitive to mental problems.¹¹ According to another study conducted in China, the depression, anxiety, and stress levels of female HCWs were found to be higher than men.²⁶

Nonetheless, there are some limitations to this study. First, the study survey was prepared only in the electronic environment due to social distance and all the answers were obtained online. Therefore, the data obtained in the study are limited to individuals who have internet access or who are able to use a computer. Another limitation of the study is that, since it is a cross-sectional study, it only provides information about a certain period of the pandemic. On the other hand, the main strengths of the study are that the sample size is large, indicating that the power of the study group to represent the population is high. Our study is also significant, as it offers historical information to the literature, revealing the psychological impacts of COVID-19 infection on HCWs across the nation during the pandemic.

CONCLUSION

In conclusion, as the elimination period of the COVID-19 pandemic, which still continues to spread intensively in the world and in our country, continues, the virus pursues its social circulation by multiplying more and infecting more individuals in an effort to survive, as indicated by evolutionary mechanisms. Further studies are warranted to gain a better understanding of drastic impacts of the COVID-19 on physical and mental health of HCWs.

*The authors declare that there are no conflicts of interest.

REFERENCES

1. World Health Organization. Coronavirus disease (COVID-19) outbreak. <https://www.who.int/publications/m/item/weekly-epidemiological-update-on-covid-19---24-august-2022> Accessed: September 16, 2022.
2. Dorn AV, Cooney RE, Sabin ML. COVID-19 Exacerbating Inequalities in the US. *Lancet* 2020; 395: 1243-1244.
3. Aldridge RW, Lewer D, Katikireddi SV, et al. Black, Asian and Minority Ethnic groups in England are at increased risk of death from COVID-19: indirect standardisation of NHS mortality data. *Wellcome Open Res* 2020; 5: 88.
4. COVID-19 DİSK RAPORU-3. http://disk.org.tr/wp-content/uploads/2020/04/Covid-19-DISK-Durum_Raporu-3-27-Nisan-2020.pdf. Accessed: January 14, 2021.
5. T.C. Sağlık Bakanlığı COVID-19 Bilgilendirme Platformu, Genel Koronavirüs Tablosu. <https://covid19.saglik.gov.tr/TR-66935/genel-koronavirus-tablosu.html>. Accessed: December 24, 2021.
6. Turkish Thoracic Society Press Release. <https://www.toraks.org.tr/site/news/10240>. Accessed: August 24, 2021.
7. Weekly operational update on COVID-19 23-29 May 2020, Assessment of risk factors for coronavirus disease 2019 (COVID-19) in health workers: protocol for a case-control study [https://www.who.int/publications/i/item/assessment-of-risk-factors-for-coronavirus-disease-2019-\(covid-19\)-in-health-workers-protocol-for-a-case-control-study](https://www.who.int/publications/i/item/assessment-of-risk-factors-for-coronavirus-disease-2019-(covid-19)-in-health-workers-protocol-for-a-case-control-study). Accessed: January 12, 2021.
8. COVID-19 weekly surveillance report data for the week of 15 - 21 Jun 2020 (Epiweek 25) <https://www.euro.who.int/en/healthtopics/healthemergencies/coronavirus-covid-19/previous-who-europe-weekly-surveillance-reports/data-for-the-week-of-15-21-jun-2020-epi-week-25>. Accessed: January 24, 2021.
9. Türk Tabipleri Birliği COVID-19 İzleme Kurulu, COVID-19 Pandemisi Altıncı Ay Değerlendirme Raporu Türk Tabipleri Birliği Yayınları, 2020.
10. Clegg A. Occupational stress in nursing: A review of the literature. *J Nurs Manag* 2001; 9: 101-106.
11. Tang C, Liu C, Fang P, Xiang Y, Min R. Work-related accumulated fatigue among doctors in tertiary hospitals: A cross-sectional survey in six provinces of China. *Int J Environ Res Public Health* 2019; 16: 3049.
12. Rossi R, Soggi V, Pacitti F, et al. Mental health outcomes among front line and second-line healthcare workers during the Coronavirus disease 2019 (COVID-19) pandemic in Italy. *JAMA Netw Open* 2020; 3: e2010185.
13. Que J, Shi L, Deng J, et al. Psychological impact of the COVID-19 pandemic on healthcare workers: a cross-sectional study in China. *Gen Psychiatry* 2020; 33: e100259.
14. Arnetz JE, Goetz CM, Sudan S, et al. Personal protective equipment and mental health symptoms among nurses during the COVID-19 pandemic. *JOEM* 2020; 62
15. T.C. Sağlık Bakanlığı 2021 Yılı Faaliyet Raporu, <https://sgb.saglik.gov.tr/Eklenti/42666/0/2021-faaliyet-raporupdf.pdf>. Accessed: March 24, 2022.
16. Yazıcıoğlu Y, Erdoğan S. SPSS Uygulamalı Bilimsel Araştırma Yöntemleri. 4th. ed. Ankara: Detay Yayıncılık; 2014.
17. Lovibond PF, Lovibond SH. The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behav Res Ther* 1995; 33: 335-343.
18. Brown TA, Chorpita BF, Korotitsch W, Barlow DH. Psychometric properties of the Depression Anxiety Stress Scales (DASS) in clinical samples. *Behav Res Ther* 1997; 35: 79-89.
19. Henry JD, Crawford JR. The short form version of the Depression Anxiety Stress Scales (DASS-21): Construct validity and normative data in a largenon clinical sample. *Br J Clin Psychol* 2005; 44: 227-239.
20. Mahmoud JSR, Staten RT, Hall LA, Lennie TA. The relationship among young adult college students' depression, anxiety, stress, demographics, life satisfaction, and coping styles. *Issues Ment Health Nurs* 2012; 33: 149-156.
21. Bilgel N, Bayram N. Turkish version of the depression anxiety stressscale (DASS-42): Psychometric properties. *Noro Psikiyatrs* 2010; 47: 118-126.
22. Akin A, Çetin B. The depression anxiety and stressscale (DASS): The study of validity and reliability. *Educ Sci Theory Pract* 2007; 7: 260-268.
23. Sarıcam H. The psychometric properties of Turkish version of Depression Anxiety Stress Scale-21 (DASS-21) in health control and clinical samples. *J Cognit Behav Psychother Res* 2018; 7: 19-30.
24. Kalaycı Ş. (Ed.) SPSS Uygulamalı Çok Değişkenli İstatistik Teknikleri. Ankara: Asil Yayın Dağıtım; 2010
25. Lai J, Ma S, Wang Y, et al. Factors associated with mental health outcomes among healthcare workers exposed to coronavirus disease 2019. *JAMA Netw Open* 2020; 3: e203976.
26. Wang C, Pan R, Wan X, et al. Immediate psychological responses and associated factors during the initial stage of the 2019 Coronavirus disease (COVID-19) epidemic among the general population in China. *Int J Environ Res Public Health* 2020; 17: 1729.