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Psychological Effect of Coronavirus Disease-19 on Healthcare Workers: A Cross-Sectional Study in Kayseri

Ali Gündoğdu[1], Saliha Özsoy[2], Sümeyra Koyuncu[1], Cihan Uysal[1], İsmail Koçyigit[1], Murat Hayri Sipahioğlu[1], Bülent Tokgöz[1], Oktay Oymak[1]

ABSTRACT

Objective: Coronavirus disease 2019 (COVID-19) has been declared a pandemic by the World Health Organization. Many studies have examined their psychological effects. However, during these periods when the new case of COVID-19 patients decreased, their psychological effects were not sufficiently reported. Our aim was to investigate the anxiety and depressive symptom levels of healthcare workers (HCW) during the periods when the increase in the number of cases slowed down in the COVID-19 epidemic.

Materials and Methods: A cross-sectional a questionnaire consisted of Beck Depression Inventory and Beck Anxiety Inventory was applied to 143 people working in a university hospital. General information such as age, gender, marital status, study history in the COVID-19 pandemic, history of chronic disease, and whether there are other HCW at home was collected and compared.

Results: The median value of beck anxiety score was 6. The median value of Beck depression score varies by gender (p=0.015). Median value of Beck depression score varies according to marital status (p=0.011). The median value of Beck anxiety score varies according to gender (p=0.008). The median value of Beck anxiety score varies according to occupational groups (p=0.003). A significant link was obtained between Beck depression groups and marital status (p<0.001).

Conclusion: COVID-19 shows that it emphasizes ways to reduce mental health risks and adjust interventions under pandemic conditions.

Keywords: Anxiety, coronavirus disease-19, depression, healthcare workers, pandemic

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[1]Department of Nephrology, Erciyes University Faculty of Medicine, Kayseri, Turkey
[2]Department of Psychiatry, Erciyes University Faculty of Medicine, Kayseri, Turkey

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Correspondence
Ali Gündoğdu,
Erciyes University Faculty of Medicine, Department of Internal Medicine, Division of Nephrology, Kayseri, Turkey
Phone: +90 535 880 25 61
e-mail:
drali_ant@hotmail.com

INTRODUCTION

The coronavirus family contains several zoonotic viruses that cause serious human diseases such as Severe Acute Respiratory Syndrome and Middle East respiratory syndrome (1). In December 2019, unknown cases of pneumonia were reported in Wuhan, Hubei Province, China which was later confirmed to be caused by the new coronavirus severe acute respiratory syndrome coronavirus (SARS-CoV)-2 (1). Coronavirus disease (COVID)-19, which caused serious respiratory diseases such as pneumonia and lung failure, a few months after the first report, the SARS-CoV-2 spread across China and worldwide, reaching the pandemic level (1). Based on the large number of infected people exposed to the animal market where live animals are routinely sold in Wuhan City, this is considered to be the likely zoonotic source of COVID-19 (1). Fear caused by COVID-19 severe clinical picture; curfew and legal punishment, a strict quarantine, mistrust of officials who mismanaged the outbreak, and an overflowing social media with misinterpretation and theories of conspiracy all have taken their toll on mental health (2). COVID-19 impact will likely be imprinted on each individual involved and widespread stressors will emerge or become exacerbated. As a result, many healthcare workers (HCW) will be negatively psychologically affected (3).

The rapid global spread of the COVID-19 led to the declaration of COVID-19 as a pandemic on March 11, 2020 (4). Increased number of cases and suspected cases, depletion of personal protection equipment, common media news, overwhelming workload, and lack of specific medicines insufficient support can all contribute to the mental burden of these HCW (5). In previous studies, HCW; fears that he/she is afraid of having the infection and infecting COVID-19 to their families, colleagues, and friends, reported uncertainty, reported reluctance to work or contemplating resignation, and reported experiencing high levels of stress, anxiety, and depression symptoms (5). In a survey conducted in Pakistan, after asking HCW the question, "Do you feel any anxiety during your job in current prevailing COVID-19 medical condition?;" 57% of them answered yes (6). Healthcare managers need to proactively take steps to protect the mental wellbeing of HCW and managers must be frank about the situations staff is likely to face (7).

According to Republic of Turkey COVID-19 information page (https://covid19.saglik.gov.tr/EN-69532/general-coronavirus-table.html); COVID-19 in Turkey between April 24, 2020, and June 13, 2020, daily number of cases, the number of recovered patients, was greater than the number of new cases. In the period when the

number of patients recovered is higher than the number of new cases, it was investigated to better understand the effects and results of HCW on anxiety and depressive symptom levels. During these periods when the first peak of the first wave decreases, there is not enough study on HCW. It highlights the need to find ways to reduce mental health risks and adjust interventions under pandemic conditions, as a significant proportion of HCW suffered from depression and anxiety disorders during the epidemic.

MATERIALS and METHODS

The cross-sectional study was carried out in Erciyes University Medical Faculty Hospital between May 2020 and June 2020. A total of 143 HCW were included in the study. HCW were taken randomly. Those who work in risky departments (such as those working in the pandemic service, emergency service and/or outpatient clinic and dialysis department) will be included in our study. The survey was conducted with in-person interviews. A self-made questionnaire was used. After asking the participants about the demographic data in the form of a questionnaire, Beck Depression Inventory (BDI) (8) and Beck Anxiety Inventory (BAI) (9) were used. Ethics approval was obtained from the Erciyes University Ethics Committee Presidency with the decision number 2020/266. The study was approved by the Ministry of Health Scientific Research Platform and the Institutional Review Board.

BDI

BDI; measures the somatic, emotional, cognitive, and motivational symptoms seen in depression. BDI, which was developed by Beck in 1961 and whose validity and reliability studies were carried out by Hisli (8); it consists of 21 items regarding depressive symptoms such as pessimism, feeling of failure, unsatisfaction, feelings of guilt, restlessness, fatigue, decreased appetite, indecision, sleep disturbance, and social withdrawal. Patients were asked to choose the most appropriate one for their own questions from these questions. Scores ranging from 0 to 63 were obtained by giving each question a score of 0, 1, 2, and 3. Cut-off value was 17 in the study of Turkish validity and reliability. Scores of 17 and above are considered significant depression (8). Subjects were subdivided into 2 groups, those without depressive symptoms (<17) or with depressive symptoms (≥17).

BAI

BAI, which was developed by Beck et al. (10) in 1988, is being used to determine the frequency of anxiety symptoms. It consists of 21 questions to determine the frequency of anxiety symptoms experienced by Beck et al. (10) Each question is evaluated between 0 (none) and 3 (seriously). High scores indicate an increase in anxiety complaints. Thus, the total score that can be obtained from this scale varies between 0 and 63 (9). A high global score points to considerable anxiety. This inventory takes 10 min approximately to complete. Validity and reliability in Turkey were made by Ulusoy et al. (9).

Statistical Analysis

Compatibility with normal distribution was examined with Kolmogorov–Smirnov and Shapiro–Wilk tests. Mann–Whitney U test was used to compare data (sex, marital status, have a chronic disease, chronic drug use, have a child, someone over 65 years old at home, other health workers at home, working history of COVID-19 pandemic in the last 10 days, previously working history in COVID-19 pandemic) without normal distribution. Kruskal–Wallis test and post hoc Bonferroni correction were used to compare psychometric test scores of job groups. The relationship between variables was analyzed by Spearman correlation analysis because of abnormal distribution. Data without normal distribution were given as median (minimum-maximum). The Pearson Chi-square test was used in comparing categorical data. Categorical data were presented as frequency (percent). The significance level was taken as $p<0.050$.

RESULTS

In our study, 143 people; 90 (63.4%) people were female, 52 (36.6%) were male. One person did not specify their gender. Thirty-three (23%) people were doctors, 51 (35.7%) were nurses, and 59 (41.3%) were hospital staff. One hundred nine (76.2%) people were married, 34 (23.8%) people were single. The age was 36.4±7.1 (mean±SD). The BDI value was 9.6±7.9 and the BAI value was 10.1±10.1.

The median value of Beck depression score varies by sex ($p=0.015$). While the median value of Beck depression score was 9 in female, it was 5.5 in male. The median value of Beck depression score varies according to marital status ($p=0.011$). While the median value of Beck depression score was 7 in married people, it was 11 in singles. The median value of Beck depression score did not differ statistically to chronic disease ($p=0.453$), chronic drug use ($p=0.746$), the have a child ($p=0.971$), the presence of someone over 65 years old at home ($p=0.456$), the presence of other health workers at home ($p=0.453$), the history of working in the COVID-19 pandemic ($p=0.482$), the history of working in the COVID-19 pandemic in the last 10 days ($p=0.295$), and the jobs ($p=0.986$) (Table 1).

The median value of Beck anxiety score varies according to sex ($p=0.008$). While the median value of Beck anxiety score was 8 in female, it was 4 in male. The median value of Beck anxiety score varies according to job groups ($p=0.018$). The median Beck anxiety score was 3 in doctors, 10 in nurses, and 6 in hospital staff. The Beck anxiety of the doctors was lower than that of the nurses ($p=0.002$). Hospital staff group did not differ according to doctor and nurse groups (respectively; $p=0.299$, $p=0.256$). Median value of Beck anxiety score did not differ statistically to chronic disease ($p=0.434$), chronic drug use ($p=0.592$), have a child ($p=0.919$), presence of someone over 65 years old ($p=0.700$), presence of other HCW at home ($p=0.508$), previous pandemic work history ($p=0.372$), and history of pandemic work in the last 10 days ($p=0.125$) (Table 2).

In our study, the number of HCW without depressive symptoms was 124 (87%), the number of HCW with depressive symptoms was 19 (13%). A significant link was obtained between Beck depression groups and marital status ($p<0.001$). While 101 (92.7%) of married people had without depressive symptoms and 8 (7.3%) had depressive symptoms, 23 (67.6%) of single people have without depressive symptoms and 11 (32.4%) had depressive symptoms. No significant correlation was found between other parameters and Beck depression groups ($p>0.050$) (Table 3).

Table 1. Comparisons of the Beck depression score

Characteristic	Beck depression score	Test statistics	p
Sex		Z=2.426	**0.015**
Female (n=90)	9 (0–29)		
Male (n=52)	5.5 (0–34)		
Marital status		Z=2.557	**0.011**
Married (n=109)	7 (0–46)		
Single (n=34)	11 (0–34)		
Chronic disease		Z=0.751	0.453
Yes (n=23)	9 (1–29)		
No (n=120)	8 (0–46)		
Chronic drug use		Z=0.324	0.746
Yes (n=16)	9 (1–27)		
No (n=127)	8 (0–46)		
Have a child		Z=0.036	0.971
Yes (n=94)	9 (0–46)		
No (n=49)	8 (0–34)		
Someone over 65 years old at home		Z=0.746	0.456
Yes (n=20)	8 (0–20)		
No (n=123)	8 (0–46)		
Other HCW at home		Z=1.048	0.294
Yes (n=29)	7 (0–22)		
No (n=114)	9 (0–46)		
Previously working history in COVID-19 pandemic		Z=0.703	0.482
Yes (n=44)	7 (0–27)		
No (n=99)	9 (0–46)		
Working history of COVID-19 pandemic in the last 10 days		Z=1.048	0.295
Yes (n=74)	9 (0–34)		
No (n=69)	7 (0–46)		
Job		χ^2=0.028	0.986
Doctor (n=33)	8 (0–34)		
Nurse (n=51)	8 (0–28)		
Hospital staff (n=59)	7 (0–46)		

Z: Mann–Whitney U test statistics; χ^2: Kruskal–Wallis test statistics; COVID: Coronavirus disease; HCW: Healthcare worker

Table 2. Comparisons by Beck anxiety score

Characteristic	Anxiety score	Test statistics	p
Sex		Z=2.642	**0.008**
Female	8 (0–44)		
Male	4 (0–27)		
Marital status		Z=1.740	0.082
The married	6 (0–41)		
Single	11 (0–44)		
Chronic disease		Z=0.782	0.434
Yes	7 (0–44)		
No	6 (0–41)		
Chronic drug use		Z=0.536	0.592
Yes	7 (0–44)		
No	6 (0–41)		
Have a child		Z=0.102	0.919
Yes	6 (0–44)		
No	7 (0–34)		
Someone over 65 years old at home		Z=0.385	0.700
Yes	5.5 (0–34)		
No	6 (0–44)		
Other HCW at home		Z=0.662	0.508
Yes	5 (0–27)		
No	7 (0–44)		
Previously working history in COVID-19 pandemic		Z=0.892	0.372
Yes	5.5 (0–41)		
No	7 (0–44)		
Working history of COVID-19 pandemic in the last 10 days		Z=1.533	0.125
Yes	7 (0–44)		
No	5 (0–41)		
Job		χ^2=11.746	**0.003**
Doctor	3 (0–27)*		
Nurse	10 (0–44)*		
Hospital staff	6 (0–41)		

Z: Mann–Whitney U test statistics; χ^2: Kruskal–Wallis test statistics; *: There is a difference between groups with the same letter; COVID: Coronavirus disease; HCW: Healthcare worker

There was a significant negative correlation between age and depression score (p=0.014). A moderately significant positive correlation was found between age and anxiety score (p<0.001).

DISCUSSION

All people are battling against the most powerful threat of the 21st century that is the COVID-19 pandemic. The entire world is focused on the global outbreak, and almost every country is affected by all aspects of this occurrence (11). The suggested treatments for COVID-19 are; ribavirin, a nucleoside analog in combination with recombinant interferon; favipiravir is a pyrazine carboxamide derivative known to inhibit RNA polymerase; remdesivir, a nucleotide analog that inhibits RNA polymerase with a broad spectrum of anti-viral activities; lopinavir/ritonavir, a combination of a protease inhibitor and a booster used for the treatment of human immunode-

Table 3. Comparisons of HCW groups according to Beck depression score

Characteristic	HCW without depressive symptoms (n=124)	HCW with depressive symptoms (n=19)	Test statistics	p
Age	38 (25–59)b	28 (24–48)b	χ^2=3.425*	**0.001**
Sex			χ^2=0.694**	0.405
Female	77 (85.6)	13 (14.4)		
Male	47 (90.4)	5 (9.6)		
Marital status			χ^2=14.074	<**0.001**
Married	101 (92.7)	8 (7.3)		
Single	23 (67.6)	11 (32.4)		
Chronic disease			χ^2=0.001	0.970
Yes	20 (87)	3 (13)		
No	104 (86.7)	16 (13.3)		
Chronic drug use			χ^2=0.010	0.922
Yes	14 (87.5)	2 (12.5)		
No	110 (86.6)	17 (13.4)		
Have a child			χ^2=1.670	0.196
Yes	84 (89.4)	10 (10.6)		
No	40 (81.6)	9 (18.4)		
Someone over 65 years old at home			χ^2=1.386	0.239
Yes	19 (95)	1 (5)		
No	105 (85.4)	18 (14.6)		
Other HCW at home			χ^2=3.056	0.080
Yes	28 (96.6)	1 (3.4)		
No	96 (84.2)	18 (15.8)		
Previously working history in COVID-19 pandemic			χ^2=1.204	0.652
Yes	39 (88.6)	5 (11.4)		
No	85 (85.9)	14 (14.1)		
Working history of COVID-19 pandemic in the last 10 days			χ^2=0.332	0.565
Yes	64 (85.1)	11 (14.9)		
No	61 (88.4)	8 (11.6)		
Job			χ^2=0.835	0.659
Doctor	28 (84.8)	5 (15.2)		
Nurse	46 (90.2)	5 (9.8)		
Hospital staff	50 (84.7)	9 (15.3)		

*χ^2: Kruskal–Wallis test statistics; **χ^2: Pearson Chi-square test statistics; COVID: Coronavirus disease; HCW: Healthcare worker

ficiency virus infection; the use plasma of patients recovering from COVID-19 disease; azithromycin and doxycycline, commonly used antibiotics to inhibit viral replication and IL-6 production and drugs that suppress IL-1 or IL-1R (4). We hope that the COVID-19 vaccine will be successful in treatment. While global attention is largely focusing on the effects of the coronavirus on physical health, the impacts of the coronavirus on psychological health cannot be overlooked. Research on the mental health effects of the COVID-19 outbreak in vulnerable groups such as HCW should be encouraged (12). This study, which we designed in the light of this information, had two main aims; 1) the state of depression and anxiety in HCW during the period when the number of new cases is reduced and the number of patients recovering increases and 2) investigated whether variables such as having a person over the age of 65 at home, having another HCW at home, having a previous work history in the pandemic, and having a chronic disease have an effect on anxiety and depression.

The main findings of this cross-sectional study are: (a) HCW were in mild anxiety and (b) Being a woman, single, and a nurse is a risk factor in COVID-19 for depression and anxiety.

The first case of COVID-19 in Turkey was detected on March 11, 2020, and the first death of COVID-19 was reported on March 17, 2020 (11). Following the first case, numbers have rapidly

increased in Turkey. With the aim of containing the virus, trips abroad were taken under control, domestic trips were restricted, formal education in the schools was halted, distance education system was introduced, and a curfew was imposed on the citizens over the age of 65 (13). According to the study of Tengilimoğlu et al., they showed that the major cause of the anxiety or stress among HCW comes from the fear to contaminate the COVID-19 virus to their families (86.9%) (14). Mental health problems such as anxiety, stress, fear, and other psychological problems should be taken into account during the pandemic (15). Quarantine in COVID-19; it has affected the routine life and health of patients with chronic illnesses such as diabetes, mental health, and hypertension (16).

Mean Beck depression score and mean Beck anxiety score show us that HCW is mild worried. COVID-19 crisis places additional pressure on doctors and on the healthcare system in general and research shows that such pressure brings a greater risk of psychological distress for doctors and HCW (17). According to twenty-five studies examining the psychological impact of the COVID-19 outbreak on HCWs, among the larger of the studies, levels of moderate anxiety ranged from 22.6% to 44.6%, and severe anxiety from 2.9% to 5.3% (18). In a study conducted in Turkey, HCW had mild to severe anxiety, about 17% reported moderate and 27% reported severe anxiety severity (12). Shaukat et al. (15) show that HCW have high levels of depression, stress, anxiety, boredom, anger, fear, insomnia, and post-traumatic stress disorder. Usually, at the early stages of a pandemic, people have little information about nature, fatality rate, treatment, etc., that fuel the fear about the organism (19). The reduction of newly diagnosed cases of COVID-19 infection may have reduced depression and anxiety. Furthermore, as the pandemic period progresses, you may be used to living with the fear of COVID-19.

There was a significant difference in Beck depression score in women and men. The fact that the psychological effect of the epidemic in women is higher at the levels of depression, this finding corresponds to the previous epidemiological studies that determined that women are at higher risk of depression (20). In addition, the fact that Doctors Beck anxiety score is lower than nurses is that most of the nurses are women. The reason nurses are affected more than doctors may be related to the fact that a greater proportion of nurses are women who spend more time with patients, perform many invasive procedures and work longer. In addition, nurses are highly exposed to increased danger and job stress due to the nature of their jobs (21). In the study conducted by Tengilimoglu et al. with nurses and doctors, it has been reported that negative life events correlate with symptoms of depression and anxiety, doctors experience more work-related negative events than nurses, but nurses show higher levels of anxiety and depression than doctors (14). Psycho-social factors, such as women being exposed to more stress because they have more duties and responsibilities in life, are associated with higher levels of depression and anxiety (22, 23).

In our data, which is interesting in our study, those who previously had a history of working in the COVID-19 pandemic (44 people in total) and who had a history of working in the COVID-19 pandemic in the last 10 days; there was no significant difference between both depression score and anxiety score. However, in a study by Lai et al., HCW were reported to have higher depression and anxiety (5). This shows us that the people working in the pandemic service got used to the situation and the low rate of COVID-19 infection in our hospital was considered to be more positive. In another opinion, when we conducted this study, the number of patients infected with COVID-19 in our country, the number of patients in intensive care unit and the mortality rates decreased, and the number of patients recovering was increasing. We think that this may have an effect.

There was a difference in BDI between married and single HCW. İn the previous studies showed that marriage is the factor affecting psychological distress in the general population. It showed a higher level of psychological distress in the unmarried population (24). Unmarried people, lack of a major social support system was found to be related to psychological distress (25). This is for us; COVID-19 infected person shows the importance of basic social support of marriage and we can suggest that should pay more attention to the HCW.

In the relationship between age and Beck depression and Beck anxiety, in a study by Ahmed et al. (19), the level of depression and anxiety was higher between the ages of 21 and 30. Furthermore, in the study of Huang et al. (26), younger participants (<35 years) were more likely to develop anxiety and depressive symptoms during the COVID-19 outbreak than older participants (≥35 years). A study conducted in Turkey showed that young HCW had higher anxiety scores than aged HCW (27). Younger HCW are more likely to be affected by the process, and a low mortality rate at a young age can increase anxiety as age increases (28). Young people tend to get a large amount of information from social media that can easily trigger stress (29) which may explain the reduction of depression as they age.

Since the first diagnosis of the disease in Turkey; medical devices and equipment were provided with HCW; financial and moral support was provided to increase the morale and motivation of HCW; working hour regulations; shorter shift work system and salary increases; it could reduce depression and anxiety levels and increase morale and motivation. Overall, HCW appear to experience widespread mental health problems during the COVID-19 outbreak. HCW appear to be in great need of psychiatric support during and after the pandemic. According to the results of our study of health sector workers in Turkey, it is now and in the future needs to show that psychiatric support.

This study has some limitations. First, longitudinal studies are needed, as our study is cross-sectional. This is how we can investigate that mental health improves with the decrease of new cases. Second, while determining the sample size, we should point out that the lack of power analysis and the small sample size is the limitations of the study.

CONCLUSION

HCW are responsible for interventions that directly affect human life and have no room for mistakes. Higher professional satisfaction and motivation of HCW, improvement of conditions that adversely affect the quality of life, acceptance, and recognition of expectations; it gives the chance to increase the scope and quality of the services provided by HCW. It is necessary to conduct longitudinal studies on this subject, assuming that HCWs can reduce anxiety and depression in the period when the number of patients recovering is more than the number of new cases.

Ethics Committee Approval: The Erciyes University Clinical Research Ethics Committee granted approval for this study (date: 10.06.2020, number: 2020/266).

Informed Consent: Written informed consent was obtained from patients who participated in this study.

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