Original Article

DOI: 10.38053/acmj.1652714

ANATOLIAN CURRENT MEDICAL

Anatolian Curr Med J. 2025;7(3):278-282

Evaluation of mood disorders in healthcare workers working in COVID-19 services/polyclinics and their first-degree relatives

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Cite this article as: Şahin B, Evrin T, Gül A, Jaradat Ö, Katipoğlu B, Dolu Z. Evaluation of mood disorders in healthcare workers working in COVID-19 services/polyclinics and their first-degree relatives. *Anatolian Curr Med J.* 2025;7(3):278-282.

Received: 06.03.2025 ◆ **Accepted**: 26.03.2025 ◆ **Published**: 30.05.2025

ABSTRACT

Aims: The COVID-19 pandemic has impacted the entire world; however, certain individuals and groups have been affected more significantly or are at a higher risk. Among these groups are medical workers, who face unique challenges. In addition to the physical consequences of the pandemic, there have been notable psychological effects. This study aims to examine the prevalence of emotional disorders in healthcare personnel working in COVID-19 services and polyclinics, as well as in their first-degree relatives.

Methods: This study was conducted in 2022 on COVID-19 Service Personnel at Ufuk University Hospital and their first-degree relatives. It included doctors, nurses, and auxiliary medical personnel who worked in either COVID-19 services or polyclinics, along with their non-medical first-degree relatives. In total, 375 participants were surveyed. The survey consisted of three sections: socio-demographic information, the short symptom inventory, and the short form for Burnout scale. The Mann-Whitney U test and the Kruskal-Wallis test were utilized for data analysis, with a p-value of <0.05 considered statistically significant.

Results: The scores for somatization, obsessive-compulsive symptoms (OCS), interpersonal sensitivity (IS), depression, anxiety, hostility, phobic anxiety (PA), paranoid ideation (PI), psychoticism, additional items (AI), sum of symptoms (SS), discomfort severity index (DSI), symptom discomfort index (SDI), and Burnout Scale were significantly higher among doctors compared to other groups. Auxiliary medical workers had the second highest scores, followed by nurses, while the non-medical control group had significantly lower scores than all medical personnel groups. It was observed that psychiatric symptoms and burnout were significantly higher among medical workers at all levels compared to their relatives in other professions.

Conclusion: Our study concludes that the pandemic has psychologically affected medical workers more than individuals in other professions, with doctors being the most affected group.

Keywords: Pandemic, COVID-19, healthcare worker, anxiety, depression

INTRODUCTION

COVID-19, an outbreak of the SARS-CoV-2 virus, first appeared in the city of Wuhan in December 2019. Earlier this virus had not been thought to infect humans before and has since triggered a global pandemic. It has caused serious changes and impacts in health, economic, and social areas all over the world. Moreover, there are psychological effects related to the virus. Information and experiences from the pandemic demonstrate that people worldwide are encountering new psychological and physical manifestations of the disease.[1] The pandemic and quarantine measures profoundly affected mental health through prolonged isolation, fear of infection, and socioeconomic stressors such as unemployment and inadequate social support. Additional contributors included fatigue, stigmatization, and insufficient resources. These factors harmed individuals' psychological well-being.[2] Comprehensive research revealed that the prevalence of anxiety, stress, and depressive symptoms in the general population during the COVID-19 outbreak was 29.6%, 31.9%, and 33.7%, respectfully.[3] Recent research has also identified a connection between COVID-19-related anxiety and the severity of insomnia and suicidal thoughts.[4] Healthcare workers generally work in a very stressful environment, such as saving and sustaining lives. This high-pressure situation places significant psychological, social, and professional demands on them.[5] Although the whole world has been affected by the pandemic, some individuals and groups have been affected more or are at higher risk of being affected. Healthcare workers face significant vulnerability and are one of the most

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at-risk groups. Healthcare workers face numerous challenges, including exposure to SARS-CoV-2, constant vigilance, team cohesion needs, home/work conflicts, long working hours, and psychological burdens. They also experience fatigue, professional exhaustion, discrimination, stigmatization, and harassment.[1] The transition toward normalization during the ongoing pandemic is resulting in increased anxiety, grief, and anger among healthcare workers, along with rising levels of burnout among professionals in hospitals and the field. The fact that healthcare workers in hospitals continue to struggle with the consequences of the pandemic leads to negative emotions such as loneliness and abandonment. It contributes to the deterioration of mental health.[1] A report published by Amnesty International revealed that as of September 3, 2020, a minimum of 7.000 healthcare professionals globally had succumbed to COVID-19 after contracting the virus.[6] With the deaths experienced, the thought that healthcare workers should protect their own health and life concurrently while combating the pandemic may cause stress. Due to this stress, an increase in behaviors such as tension, anxiety, restlessness, sleep disorders, depressive disorders, etc., can be observed.[7,8] Research during the SARS outbreak shows that healthcare workers' mental health declines in epidemic situations. Studies indicate that healthcare professionals felt considerable anxiety about potentially transmitting the virus to their families, friends, and colleagues. This fear contributed to feelings of uncertainty and social stigma associated with their roles. Furthermore, some healthcare workers contemplated resigning from their positions due to the overwhelming stress and fear of infection. The findings underscore the substantial psychological impact that infectious disease outbreaks can have on individuals working within the healthcare sector.[9] The purpose of this study was to investigate the prevalence of mood disorders among healthcare workers in the COVID-19 ward and outpatient clinic of a hospital and their first-degree relatives.

METHODS

Our cross-sectional study was conducted at Ufuk University Hospital after the approval of Ufuk University Non-interventional Clinical Researches Evaluation Ethics Committee (Date: 16.02.2022, Decision No: 22.02.16.02/04). The study's population comprised health personnel of Ufuk University Hospital and their first-degree relatives. Two groups were planned in the study: the first group consisted of healthcare personnel; the second group consisted of a person who was a first-degree relative of this personnel and who was not a healthcare worker. The minimum number of participants was found to be 176 in each group and 352 in total, with a ratio of 1:1, α=0.05, power=80%, and effect size=0.3 for the sample size. The sample size was determined a priori based on α=0.05, power=80%, and effect size=0.3, ensuring statistical adequacy. However, the single-center design may limit generalizability to broader healthcare settings. In the study, the healthcare personnel group (first group) included doctors, nurses, or other healthcare personnel working in the COVID-19 service or polyclinic of Ufuk University; the second group included a first-degree relative of each healthcare personnel who was not healthcare personnel. Those older than 18 years of age, working in the COVID-19 service or outpatient clinic, and voluntarily agreeing to participate in the study were included. Non-healthcare workers, first-degree relatives of healthcare workers, those who had not worked in a COVID-19 service or outpatient clinic, those with a previous diagnosis of psychiatric illness, those taking psychiatric medication and those who declined to be involved in the study were excluded. Informed consent was received from all the volunteers before the questionnaire was administered. The study was designed in accordance with the principles of the Declaration of Helsinki. A total of 375 people were reached: 208 in the first group (healthcare workers) and 167 in the second group (relatives of healthcare workers).

The data collection form utilized in the study is divided into three sections. In the first part, sociodemographic characteristics of the participants, such as gender, age, occupation, and working period, were asked. In the second part, the Brief symptom inventory (BSI) scale was used to assess the general psychopathology of the participants. The BSI consists of 9 subscales, 3 global indices, and additional items. The nine subscales of the scale are somatization, obsessive-compulsive symptoms (OCS), IS, depression, anxiety, hostility, phobic anxiety (PA), paranoid ideation (PI) and psychoticism. The global indices of the scale are discomfort severity index (DSI), sum of symptoms (SS), and symptom discomfort index (SDI). Additional items (AI) are items related to sleep disorders, eating and drinking disorders, considerations and thoughts regarding death and dying, as well as experiences of guilt. The BSI is a 5-point Likert-type scale. Each item is calculated by scoring between 0 and 4.[10] Şahin et al.[11] conducted the validation of the scale in Turkey and found that the Cronbach's alpha coefficient for the entire scale was 0.94. In the third section, the Burnout scale short form was used to assess the burnout status of the participants. The scale contains 10 items that assess an individual's physical, emotional, and mental exhaustion levels. It utilizes a 7-point Likert scale (1=never and 7=always). The scale, created by Pines and Aronson in 1988, originally had 21 items. In 2005, Pines created a shorter 10-item version. The scale score is calculated by summing the scores of the 10 items and dividing by 10. A high score indicates a high level of burnout. Çapri[12] conducted the validation of the scale in Turkiye in 2013.

Statistical Analysis

In this study, Cronbach's alpha coefficient for the overall scale was confidently determined to be 0.91. Statistical Package for Social Sciences (SPSS) version 22.0 (IBM, New York, USA) was used for data analysis. Mean±standard deviation (SD), median-quartiles (Q1-Q3), and number/percentage were used to present descriptive data. Mann-Whitney U and Kruskal-Wallis tests were used in statistical analyses because the dependent variables did not fit the normal distribution in the normality assessment. When a significant difference was detected in variables with more than two groups, the post-hoc Bonferroni test was used to determine the groups with a difference. The limit of statistical significance was accepted as $p<0.05$.

RESULTS

A total of 375 people participated in the study. Of the participants, 217 (57.9%) were female, and 202 (53.9%) were single. Most were between the ages of 25 and 34 and had not yet completed 10 years in the profession. 64 (17.1%) of the healthcare workers said they worked 16 hours or more daily. The sociodemographic information of the participants is given in Table 1.

Table 1. Sociodemographic characteristics of the participants

Feature	n	%
Gender		
Female	217	57.9
Male	158	42.1
Age		
18-24	74	19.7
25-34	185	49.3
35-50	79	21.1
51-64	34	9.1
65 and over	3	0.8
Marital status		
Married	173	46.1
Single	202	53.9
Profession year		
0-9 years	252	67.2
10-19 years	65	17.3
20-29 years	38	10.1
30 and above	20	5.3
Profession		
Doctor	97	25.9
Nurse	63	16.8
Other health personnel	48	12.8
A relative of a health worker	167	44.5
Working unit		
COVID-19 service	72	19.2
COVID-19 polyclinic	94	25.1
COVID-19 intensive care	39	10.9
Daily working hours		
0-8 hours	86	22.9
8-16 hours	93	24.9
16 hours or more	64	17.1
Total	375	100.0

*: Bonferroni test, Mann Whitney-U test was used for pairwise comparisons, and Kruskal-Wallis test was used for three or more comparisons

Demographic characteristics of healthcare workers were used to compare DSI index scores with BSI burnout scale results. The DSI index score was higher in single healthcare workers than in married healthcare workers. COVID-19 service workers scored higher on the burnout scale than COVID-19 intensive care unit workers, and those who had been in the profession for 0-9 years scored higher on the burnout scale than those who had been in the profession for 20-29 years (Table 2).

A statistically significant difference was found when the short symptom inventory sub- dimensions and burnout scale scores were compared according to occupational groups. Physicians exhibited markedly elevated scores across somatization, OCS, interpersonal sensitivity (IS), anxiety, and depression, Hostility, Psychoticism, PA, PI, AI, SS, DSI, SDI, and Burnout scale scores compared to other groups. Other health personnel had the second-highest scores, while nurses ranked third. Post-hoc analyses found that the scores of the control group without healthcare personnel were significantly lower than all healthcare personnel groups (Table 3).

Table 2. Comparison of DSI and burnout scale scores according to some characteristics of healthcare workers

	DSI score	p-value	Burnout	p-value
Gender				
Female	0.51±0.40	0.607	4.18±1.85	0.458
Male	0.54±0.39		3.97±1.93	
Age				
18-24	0.51±0.44	0.556	3.82±2.02	0.186
25-34	0.56±0.40		4.35±1.82	
35-50	0.43±0.31		3.74±1.75	
51-64	0.57±0.39		3.64±2.20	
65 and over	0.18		1.70	
Marital status				
Married	0.44±0.34	0.032	3.89±1.84	0.202
Single	0.58±0.42		4.22±1.91	
Working unit				
COVID-19 service (1)	0.62±0.39	0.037 3<1*	4.47±1.92	0.018 3<1*
COVID-19 polyclinic (2)	0.53±0.40		4.33±1.84	
COVID-19 ICU (3)	0.41±0.37		3.43±1.84	
Daily working hours				
0-8 hours	0.50±0.37	0.298	3.92±1.70	0.154
8-16 hours	0.49±0.41		4.00±1.95	
16 hours or more	0.59±0.40		4.50±1.93	
Profession year				
0-9 years (1)	0.56±0.41	0.058	4.29±1.87	0.033 3<1*
10-19 years (2)	0.47±0.36		3.77±1.85	
20-29 years (3)	0.31±0.28		2.97±1.42	
30 and above (4)	0.71±0.48		4.28±2.92	

DSI: Discomfort severity index, ICU: Intensive care unit, *: Bonferroni test, Mann-Whitney U test was used for pairwise comparisons, and Kruskal-Wallis test was used for three or more comparisons

DISCUSSION

At the center of the COVID-19 crisis, healthcare workers must successfully manage both COVID-19 patients and other patients, while also taking care of their families and maintaining their personal responsibilities. The psychological health and general wellbeing of healthcare workers has garnered attention, with studies indicating high levels of burnout, psychological stress, and suicide rates.[13] In our study, we compared healthcare workers to individuals from other professional groups regarding burnout and psychiatric symptoms. We found that all healthcare workers scored higher on both scales than the scores of the control group of non-healthcare workers. In a study by Mete et al.[14] during the early pandemic, the prevalence of psychiatric disorders in healthcare workers was between 36.7% and 51.6%. Anxiety symptoms were reported in 50% of cases. Among nurses, the prevalence ranged from 50.2% to 70.3%; for physicians, it was 31.4% to 68.3%; and for other healthcare workers, it was 37.5% to 49.7%. The study found that psychiatric symptoms were observed to be 1.50 to 3.46 times more frequent in individuals who experienced COVID-19 symptoms in the past month. Additionally, these symptoms were 1.76 to 2.74 times more prevalent in those diagnosed with COVID-19, and 1.77 to 2.25 times higher in individuals who had a COVID-19 diagnosis within their immediate family, and 1.76 to 3.15 times higher in healthcare workers who had lost someone to COVID-19 in their immediate family.[14] In our study, psychiatric symptom scores were higher in all healthcare workers compared to their relatives. A study conducted in Wuhan during the COVID-19 outbreak revealed that no less than one-third of healthcare professionals reported experiencing mental health symptoms.[15] A separate investigation involving 1.257 healthcare workers in China revealed that 35.6% exhibited depressive symptoms, while 33.2% reported experiencing

Table 3. Comparison of BSI and Burnout Scale scores according to occupational groups

	Profession group *					
	Doctor (1) mean±SD	Nurse (2) mean±SD	Other HP (3) mean±SD	HP's relative (4) mean±SD	p-value	
Somatization	1.69±1.35	0.79±0.77	1.09±1.10	0.54±0.74	<0.001	4<2<3<1
OCS	2.12±1.28	1.19±0.84	1.37±1.11	0.81±0.91	<0.001	4<2<3<1
IS	2.06±1.37	1.16±0.95	1.23±1.17	0.77±0.94	<0.001	4<2<3<1
Depression	2.16±1.29	1.21±0.88	1.36±1.15	0.82±0.93	<0.001	4<2<3<1
Anxiety	2.04±1.31	1.01±0.78	1.10±1.14	0.62±0.82	<0.001	4<2<3<1
Hostility	1.99±1.31	1.03±0.85	1.30±1.13	0.71±0.89	<0.001	4<2<3<1
PA	1.69±1.37	0.84±0.86	1.18±1.18	0.53±0.80	<0.001	4<2<3<1
PI	2.17±1.28	1.42±0.98	1.43±1.12	0.79±0.89	<0.001	4<2<3<1
Psychoticism	1.75±1.39	0.87±0.77	1.07±0.96	0.57±0.79	<0.001	4<2<3<1
Additional items	1.93±1.33	1.03±0.81	1.18±1.10	0.69±0.87	<0.001	4<2<3<1
SS	39.13±16.45	31.95±15.66	32.10±16.86	21.61±16.35	<0.001	4<2<3<1
DSI	0.66±0.44	0.34±0.25	0.47±0.35	0.22±0.27	<0.001	4<2<3<1
SDI	0.80±0.34	0.52±0.23	0.63±0.28	0.46±0.24	<0.001	4<2<3<1
Burnout	4.81±1.31	3.58±1.50	3.36±2.00	2.58±1.65	<0.001	4<2<3<1

HP: Health personnel, OCS: Obsessive-compulsive symptom, IS: Interpersonal sensitivity, PA: Phobic anxiety, PI: Paranoid ideation, SS: Sum of symptoms, DSI: Disturbance severity index, SDI: Symptom discomfort index, *: Kruskal-Wallis test, Bonferroni test was used in post-hoc analyses

symptoms of anxiety.[16] Additional research on the psychological burden of COVID-19 on healthcare workers indicated a significant impact on their mental well-being. Lai et al.[16] documented experiences of anxiety, depression, sleep disturbance, and stress amongst healthcare workers. Moreover, Li et al.[17] identified that these individuals faced symptoms of anxiety and depression, alongside reductions in positive affect and overall life satisfaction scores. Zhang et al.[18] further reported occurrences of insomnia, anxiety, depression, somatization, and OCS within this population. Additionally, Tan et al.[19] underscored that anxiety, depression, and post-traumatic stress disorder were present within this population. A systematic review highlighted anxiety, depression, and insomnia among COVID-19 healthcare workers, underscoring the urgent need for targeted mental health interventions.[20] Given the literature, our study found that healthcare workers scored higher on all subscales and indices of the BSI and the burnout scale compared to the control group. Research into the psychosocial impact of the COVID-19 outbreak on hospital workers has shown that nurses were the most affected occupational group.[21] A study conducted in a Chinese COVID-19 ward clearly demonstrated that nurses experienced higher levels of psychological symptoms than doctors, with women showing a significantly higher incidence than men.[22] In our study, physicians were the group with the highest score, and no gender differences were found. Contrary to studies identifying nurses as the most affected group, our findings highlighted physicians' elevated psychological burden. This discrepancy may stem from physicians' heightened decision-making responsibilities, prolonged exposure to critically ill patients, and administrative pressures during the pandemic. Additionally, physicians often face longer working hours and ethical dilemmas regarding resource allocation, which may exacerbate burnout. The interaction among different occupational groups with patients varies globally due to the diversity of health systems, which may clarify these findings. A study conducted in China examined trauma levels among three groups: healthcare professionals on the front line, those on the back line, and the general population throughout the pandemic. Interestingly, frontline healthcare professionals were found to have lower levels of trauma symptoms than backline workers.[17] This finding is attributed to the public spending more time at home and engaging with media, due to the strict isolation policies implemented in China during the study period. In our study, on the contrary, the scale scores were highest in physicians working in the forefront and lowest in relatives of healthcare workers. Experiencing the effects of the disease more closely, working conditions and the intensity of working hours may have led to this result, as expected. Similar to our study, a meta-analysis of the psychological impact of the pandemic on healthcare professionals found that working conditions would also play an important role. There is a noteworthy prevalence of anxiety and depression among frontline health care professionals in the majority of studies conducted.[23] Based on research, it is inevitable that mental health assessment, support, treatment, and services will be developed and implemented to overcome the pandemic at this time.[24] The accuracy of survey studies is often affected by respondents' ability to recall information, which can lead to incorrect or incomplete answers.

Limitations

Our study has some limitations. First, because we used a cross-sectional design, we cannot determine cause-and-effect relationships. Also, since participation was voluntary, it might have created a selection bias. The research took place at just one healthcare facility, so the results may not apply to other places or healthcare workers. We also had difficulty recruiting enough relatives of healthcare workers for the control group, which could have affected our sample. Future studies that follow participants over time are needed to understand

how work-related stress affects mental health. Despite these limitations, our findings provide important insights into the psychological impact of the pandemic on healthcare workers.

CONCLUSION

Our study concludes that the pandemic has psychologically affected medical workers more than individuals in other professions, with doctors being the most affected group. These findings underscore the urgent need for systemic interventions, such as mental health screenings, accessible counseling services, and workload redistribution policies, to safeguard healthcare workers' wellbeing. Prioritizing physician support programs, given their disproportionate burden, could enhance resilience during future crises. Ensuring the protection of healthcare professionals is essential for the effective implementation of public health initiatives during large-scale health crises.

ETHICAL DECLARATIONS

Ethics Committee Approval

The study was with the approval of the Ufuk University Non-interventional Clinical Researches Ethics Committee (Date: 16.02.2022, Decision No: 22.02.16.02/04).

Informed Consent

All patients signed and filled and informed consent form.

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

The authors declared that this study has received no financial support.

Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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