

Persistent Burnout Despite Recovery of Anxiety and Depressive Symptoms After COVID-19: A Repeated Cross-Sectional Study of Primary Healthcare Workers in Southeast Europe, 2021–2023

Perzistentni sindrom sagorijevanja unatoč oporavku od simptoma anksioznosti i depresije nakon bolesti COVID-19: ponovljena presječna studija zdravstvenih djelatnika primarne zdravstvene zaštite u jugoistočnoj Europi, 2021. – 2023.

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Sažetak

Uvod: Pandemija bolesti COVID-19 imala je značajan utjecaj na mentalno zdravlje zdravstvenih djelatnika, no podaci o perzistenciji psiholoških posljedica u postpandemijskom razdoblju, osobito u primarnoj zdravstvenoj zaštiti, i dalje su ograničeni. Cilj ovog istraživanja bio je ispitati promjene u razinama anksioznosti, depresivnih simptoma i sindroma sagorijevanja među zdravstvenim djelatnicima primarne zdravstvene zaštite tijekom pandemije i nakon njezina završetka.

Metode: Provedeno je ponovljeno presječno istraživanje među zdravstvenim djelatnicima Doma zdravlja Mostar tijekom trećeg vala pandemije COVID-19 (travanj – svibanj 2021. godine) i u postpandemijskom razdoblju (listopad 2023. godine). Anksioznost i depresivni simptomi procijenjeni su Beckovim inventarom anksioznosti (BAI) i Beckovim inventarom depresije-II (BDI-II), dok je sindrom sagorijevanja procijenjen pomoću 15-članog upitnika sagorijevanja. Analizirane su razlike između razdoblja te prema izloženosti radu s COVID-19 pozitivnim pacijentima, kao i povezanost ishoda s intenzitetom radnog opterećenja.

Rezultati: U usporedbi s 2021. godinom, u 2023. zabilježeno je statistički značajno smanjenje razina anksioznosti i depresivnih simptoma. Suprotno tomu, razine sindroma sagorijevanja nisu pokazale vidnu promjenu između pandemijskog i postpandemijskog razdoblja. Zdravstveni djelatnici uključeni u rad s COVID-19-pozitivnim pacijentima imali su izražene više razine sagorijevanja koje su bile pozitivno povezane s brojem radnih dana i sati rada dnevno, dok takve povezanosti nisu utvrđene za anksioznost i depresiju.

Rasprava i zaključak: Rezultati upućuju na to da se anksiozni i depresivni simptomi povlače nakon završetka pandemije, dok profesionalna iscrpljenost perzistira. Nalazi ističu potrebu za dugoročnim organizacijskim mjerama usmjerenima na radno opterećenje u primarnoj zdravstvenoj zaštiti.

Ključne riječi: profesionalno sagorijevanje, anksioznost, depresija, primarna zdravstvena zaštita, zdravstveni djelatnici

Kratak naslov: Perzistentni sindrom sagorijevanja nakon pandemije COVID-19

Abstract

Introduction: The COVID-19 pandemic had a substantial impact on the mental health of healthcare workers; however, evidence regarding the persistence of psychological consequences in the post-pandemic period, particularly in primary healthcare, remains limited. This study aimed to examine changes in anxiety, depressive symptoms, and burnout among primary healthcare workers during and after the COVID-19 pandemic.

Methods: A repeated cross-sectional study was conducted among healthcare workers at the Health Center Mostar during the third wave of the COVID-19 pandemic (April-May 2021) and in the post-pandemic period (October 2023). Anxiety and depressive symptoms were assessed using the Beck Anxiety Inventory (BAI) and the Beck Depression Inventory-II (BDI-II), while burnout was measured using a 15-item burnout questionnaire. Differences between periods and according to exposure to work with COVID-19-positive patients were analyzed, as well as associations between mental health outcomes and workload intensity.

Results: Compared with 2021, anxiety and depressive symptom levels were significantly lower in 2023. In contrast, burnout levels did not differ significantly between the pandemic and post-pandemic periods. Healthcare workers caring for COVID-19-positive patients exhibited significantly higher burnout scores, which were positively associated with the number of working days per week and the number of working hours per day. No such associations were observed for anxiety or depressive symptoms.

Discussion and conclusion: These findings suggest that anxiety and depressive symptoms tend to resolve over time, whereas occupational burnout persists beyond the pandemic's acute phase. The results highlight the need for long-term organizational strategies addressing workload in primary healthcare settings.

Keywords: professional burnout, anxiety, depression, primary health care, health personnel

Short title: Persistent burnout after COVID-19

Received / Primljeno February 2nd 2026 / 2. veljače 2026.;

Accepted / Prihvaćeno March 17th 2026 / 17. ožujka 2026.;

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Introduction

The COVID-19 pandemic represented an unprecedented global public health challenge which, in addition to its direct somatic consequences, had a profound and long-lasting impact on the mental health of healthcare workers. Early systematic reviews and meta-analyses demonstrated a high prevalence of depressive symptoms, anxiety, and insomnia among healthcare professionals during the pandemic, confirming that healthcare workers were exposed to a particularly intense combination of professional, organizational, and emotional stressors [1]. Further large-scale studies showed that healthcare workers directly involved in the care of patients with COVID-19 had significantly higher levels of depression, anxiety, insomnia, and distress than those with less direct exposure, underlining the psychological burden of pandemic-related clinical work [2].

Working under pandemic conditions was characterized by increased workload, continuous exposure to infection risk, uncertainty regarding the availability of personal protective equipment, rapidly changing protocols, and fear of transmitting infection to family members. Shanafelt et al. emphasized that key sources of anxiety among healthcare professionals included inadequate protection, insufficient institutional support, unclear communication, and concerns for personal and family safety, highlighting the central role of organizational factors in shaping mental health outcomes during the pandemic [3]. Similarly, an international cross-sectional study found that depressive symptoms in healthcare workers were associated not only with direct clinical demands, but also with modifiable workplace factors such as inadequate PPE, poor workplace support, insufficient training, and lack of mental health support [4]. A cross-sectional study was conducted in 41 countries. The primary outcome was depressive symptoms, derived from the validated Patient Health Questionnaire-2 (PHQ-2).

However, the work of healthcare workers in primary healthcare settings differed in important ways from that in hospital settings and deserves specific consideration. Whereas hospital-based staff were more often concentrated on inpatient monitoring and treatment of clinically unstable patients, primary healthcare workers functioned as the first point of contact, performed early triage of suspected COVID-19 cases, managed a large proportion of patients in the community, reorganized access to care through remote consultations, and simultaneously maintained care for chronic and acute non-COVID conditions [5, 6]. Reviews of the impact of COVID-19 on primary care have shown that the pandemic substantially affected service redesign, long-term illness management, staff well-being, and continuity of care, indicating that the burden in primary care extended beyond direct infection control and included broad organizational and system-level pressures [7, 8].

This specific burden of primary healthcare has also been documented empirically. A cross-sectional study of primary care workers found substantial psychological distress in nearly half of respondents and identified resilience-related and occupational factors as important correlates of poorer mental health [9]. Qualitative studies among primary he-

althcare workers further described persistent uncertainty, fear of infection, role expansion, and the psychological strain of rapidly changing work processes, especially in settings with limited organizational and human resources [10, 11]. In addition, studies from Europe showed that primary care services were under pressure to preserve continuity of care for vulnerable and chronically ill patients, adding to the cumulative burden on frontline staff [12]. Even after the acute pandemic phase, general practitioners continued to report excessive workload, administrative burden, dissatisfaction with changing regulations, and strain related to service provision, suggesting that pandemic-related stressors in primary care may persist beyond the initial crisis period [13].

Despite extensive research on the mental health impact of COVID-19 on healthcare workers, evidence on the persistence of psychological consequences beyond the acute pandemic phase remains limited, particularly in primary healthcare settings. Most available studies are cross-sectional and were conducted during the early pandemic waves, while direct comparisons between pandemic and post-pandemic periods remain scarce, especially in Southeast Europe. This gap is important because primary healthcare workers were exposed not only to infection-related stress but also to prolonged organizational strain associated with triage responsibilities, service reorganization, and continuity of care for non-COVID patients. In Bosnia and Herzegovina, high levels of burnout were documented among healthcare workers during the pandemic, particularly among those actively involved in the COVID-19 response and among respondents working in primary care, further underscoring the relevance of this issue in the local context [14].

Therefore, this study aimed to examine mental health outcomes among healthcare workers at the Mostar Health Center during the third wave of the COVID-19 pandemic in 2021 and in the post-pandemic period in 2023 using a repeated cross-sectional design. The study focused on symptoms of anxiety, depressive symptoms, and burnout, differences according to exposure to work with COVID-19-positive patients, and associations with workload intensity and organizational characteristics. By addressing these gaps, the present study provides novel insights into the evolution and persistence of psychological burden in primary healthcare workers. It also shows the development of targeted organizational and preventive strategies for future health crises.

Participants and Methods

Study Design

This study used a repeated cross-sectional design with two independent samples of healthcare workers from the same institution. Data were collected at two time points: during the third wave of the COVID-19 pandemic (April-May 2021) and in the post-pandemic period (October-November 2023). In both study waves, questionnaires were admini-

nistered online using Google Forms. The survey link was distributed to healthcare workers employed at the Mostar Health Center during the respective study periods. Participation was voluntary and anonymous.

In both study waves, questionnaires were distributed to employees from the same organizational units and departments to obtain structurally comparable samples with respect to workplace setting and professional profile. Because participation was anonymous, individual respondents could not be linked across the two waves; therefore, the analyses reflect population-level rather than individual-level change over time. No personally identifiable data were collected through the online survey platform, which ensured respondent anonymity across both study waves.

Participants

Eligible participants in both study waves were healthcare workers employed at the Mostar Health Center at the time of data collection who voluntarily agreed to participate. Only healthcare professionals (physicians, nurses/medical technicians, and other healthcare professionals) were included, whereas non-medical staff were excluded.

The 2021 and 2023 samples were considered comparable regarding professional composition, work environment, and organizational setting; however, they did not necessarily include the same individuals.

For the pandemic-period analysis, participants were additionally categorized into two groups according to occupational exposure to COVID-19-positive patients:

- 1) healthcare workers who worked with COVID-19-positive patients;
- 2) healthcare workers who did not work with COVID-19-positive patients.

Within the exposed group, additional data were collected on the intensity of COVID-19-related work, including the number of working days per week and the number of working hours per day spent caring for COVID-19-positive patients.

Data Collection Instruments

Data were collected using four questionnaires:

- 1) Sociodemographic questionnaire - a purpose-designed instrument collecting data on sex, age, educational level, work experience, exposure to COVID-19-positive patients, changes in socioeconomic status during the pandemic, and work organization.
- 2) Beck Depression Inventory-II (BDI-II) - a standardized questionnaire for assessing the severity of depressive symptoms [15].
- 3) Beck Anxiety Inventory (BAI) - a standardized instrument used to assess anxiety levels [16].
- 4) Burnout questionnaire: Burnout syndrome was assessed using a 15-item questionnaire developed by the American Psychological Association, adapted and described by Mazzi (2016). The questionnaire evaluates

symptoms of occupational burnout, with higher total scores indicating a higher level of burnout [17].

The sociodemographic questionnaire was developed specifically for this study and was not previously published. The BDI-II and BAI are standardized instruments that are widely used in clinical and research settings, but they are not reproduced in the manuscript. The burnout questionnaire was used in an adapted form as described in the cited source. Details on the instruments are available from the corresponding author upon reasonable request.

Study Outcomes

The primary outcomes were differences in burnout, anxiety, and depressive symptom levels between the pandemic-period sample (2021) and the post-pandemic sample (2023). Secondary outcomes included differences according to occupational exposure to COVID-19-positive patients during the pandemic period, as well as associations between mental health outcomes and workload intensity, measured by the number of days worked per week and the number of hours worked per day with COVID-19-positive patients.

Statistical Analysis

Data were analyzed using descriptive and inferential statistical methods. Continuous variables were summarized as medians and interquartile ranges (IQR), whereas categorical variables were presented as frequencies and percentages.

Differences in categorical variables were assessed using Pearson's chi-square test or Fisher's exact test, as appropriate. Comparisons of continuous variables between independent groups and between the 2021 and 2023 study waves were performed using the Mann-Whitney U test. Associations between age, intensity of COVID-19-related work, and psychological outcomes were examined using Spearman's rank correlation coefficient (ρ).

All statistical tests were two-sided, and $p < 0.05$ was considered statistically significant. Statistical analyses were performed using SPSS for Windows, version 17.0 (SPSS Inc., Chicago, IL, USA).

Results

Sociodemographic and Organizational Characteristics

Sociodemographic and work-related characteristics of participants were analyzed according to involvement in work with COVID-19-positive patients during the pandemic period (Table 1). Among healthcare workers who worked with COVID-19-positive patients, physicians were the predominant professional group, whereas participants who were not involved in COVID-19 care were more frequently those with secondary education. The difference in educational structure between groups was statistically significant ($\chi^2 = 22.833$; $p < 0.001$).

Participants who did not work with COVID-19-positive patients more often reported lower income during the pandemic compared with those involved in COVID-19 care ($\chi^2 = 7.054$; $p = 0.029$). Conversely, participants working with COVID-19-positive patients more frequently reported unchanged or higher income levels.

Significant differences were also observed in reported cooperation with colleagues ($\chi^2 = 9.953$; $p = 0.007$). A higher proportion of participants involved in COVID-19 care rated cooperation with colleagues as excellent or good, whereas those not working with COVID-19-positive patients more frequently reported poor cooperation. No statistically significant differences were found between groups concerning sex, socioeconomic status of the immediate family, or work organization (Table 1).

TABLE 1. Sociodemographic and work-related characteristics of participants according to involvement in work with COVID-19-positive patients during the pandemic period (2021)

	Worked with COVID-19-positive patients				χ ²	p
	No		Yes			
	n	%	n	%		
Gender					0.237	0.627
M	11	42.3	19	33.9		
F	15	57.7	37	66.1		
Education					22.833	<0.001*
SS	20	76.9	12	21.4		
FZS1	1	3.8	3	5.4		
FZS2	0	0.0	6	10.7		
DRMED	5	19.2	35	62.5		
Income during the pandemic					7.054	0.029
Lower	7	26.9	5	8.9		
Same	17	65.4	36	64.3		
Higher	2	7.7	15	26.8		
Socioeconomic status of immediate family					3.986	0.416*
Income reduction	9	34.6	16	28.6		
Forced unpaid leave	3	11.5	3	5.4		
Fear of job loss	3	11.5	9	16.1		
Job loss	4	15.4	4	7.1		
None	7	26.9	24	42.9		
Work organization					2.294	0.318*
Excellent	4	15.4	12	21.4		
Good	20	76.9	34	60.7		
Poor	2	7.7	10	17.9		
Colleague cooperation					9.953	0.007
Excellent	4	15.4	25	44.6		
Good	13	50.0	25	44.6		
Poor	9	34.6	6	10.7		

Note: Data are presented as n (%). Group differences were tested using Pearson's chi-square test or Fisher's exact test, as appropriate. Abbreviations: SS, secondary school qualification; FZS1, undergraduate study in health sciences; FZS2, graduate study in health sciences; DRMED, doctor of medicine.

Age Differences and Psychological Outcomes According to Work With COVID-19–Positive Patients (2021)

Age differences and psychological outcomes between healthcare workers who worked with COVID-19-positive patients and those who did not were analyzed for the pandemic period only (2021) (Table 2). No statistically significant differences were observed between groups with respect to age, anxiety levels measured by the Beck Anxiety Inventory (BAI), or depressive symptoms measured by the Beck Depression Inventory-II (BDI-II).

In contrast, participants who worked with COVID-19-positive patients had significantly higher burnout scores compared with those not involved in COVID-19 care ($Z = -2.662$; $p = 0.008$) (Table 2).

Association Between Age, Intensity of COVID-19–Related Work, and Psychological Outcomes

Associations between age, intensity of work with COVID-19-positive patients, and psychological outcomes during the pandemic period are presented in Table 3. Age was not significantly associated with anxiety, depressive symptoms, or burnout scores.

A statistically significant positive association was observed between the number of days worked per week with COVID-19-positive patients and burnout scores ($\rho = 0.317$; $p = 0.004$). Similarly, the number of hours worked per day with COVID-19-positive patients was positively associated with burnout scores ($\rho = 0.273$; $p = 0.014$). No statistically significant associations were found between intensity of COVID-19-related work and anxiety or depressive symptom scores (Table 3).

Comparison of Mental Health Outcomes Between 2021 and 2023

A comparison of mental health outcomes between the pandemic period (2021) and the post-pandemic period (2023) is shown in Table 4. Anxiety levels measured by the BAI were significantly higher in 2021, with a median of 30 (IQR 24–36), compared with 25 (IQR 19–31) in 2023 ($Z = -2.89$; $p = 0.004$). Depressive symptoms measured by the BDI-II also showed a statistically significant decrease from 2021 to 2023, with medians of 6 (IQR 2–10) and 4 (IQR 1–8), respectively ($Z = -2.17$; $p = 0.030$).

In contrast, no statistically significant difference was observed in burnout scores between the two periods. Median burnout scores were 33 (IQR 23–43) in 2021 and 34 (IQR 25–44) in 2023 ($Z = -0.41$; $p = 0.682$) (Table 4).

TABLE 2. Age differences and psychological outcome scores according to work with COVID-19-positive patients during the pandemic period (2021)

	Worked with COVID-19-positive patients				Z	p
	No		Yes			
	M	IQR	M	IQR		
Age	40.00	14.00	37.00	16.00	-0.070	0.944
BAI	8.00	13.00	10.50	11.00	-0.880	0.379
BDI-II	6.00	9.00	6.50	8.50	-0.934	0.350
Burnout score	28.00	20.00	36.00	14.75	-2.662	0.008

Note: Data are presented as median (IQR). Between-group comparisons were performed using the Mann-Whitney U test. BAI = Beck Anxiety Inventory; BDI-II = Beck Depression Inventory-II.

TABLE 3. Correlations between age, intensity of work with COVID-19-positive patients, and psychological outcomes among healthcare workers exposed to COVID-19-positive patients during the pandemic period (2021; N = 56)

	BAI		BDI-II		Burnout score	
	r	p	r	p	r	p
Age	0.070	0.536	0.028	0.800	0.007	0.950
Days worked per week with COVID-19-positive patients	0.180	0.108	0.111	0.321	0.317	0.004
Hours worked per day with COVID-19-positive patients	0.005	0.968	0.066	0.559	0.273	0.014

Note: Associations were examined using Spearman's rank correlation coefficient (ρ). BAI = Beck Anxiety Inventory; BDI-II = Beck Depression Inventory-II.

TABLE 4. Comparison of age and psychological outcomes between the pandemic (2021) and post-pandemic (2023) study waves

	2021		2023		Z	p
	M	IQR	M	IQR		
Age	41	15.00	39	13.00	-0.12	0.950
BAI	30.00	12.00	25.00	12.00	-2.89	0.004
BDI-II	6.00	8.00	4.00	7.00	-2.17	0.030
Burnout score	33.00	20.00	34.00	19.00	-0.41	0.682

Note: Data are presented as median (IQR). Between-period comparisons were performed using the Mann-Whitney U test. BAI = Beck Anxiety Inventory; BDI-II = Beck Depression Inventory-II.

Discussion

In this repeated cross-sectional study conducted in a primary healthcare setting in Southeast Europe, no statistically significant differences were observed in age, anxiety levels, or depressive symptoms between healthcare workers who worked with COVID-19–positive patients during the pandemic and those who were not involved in COVID-19 care. This finding suggests that, within the studied context, direct exposure to COVID-19 patients was not independently associated with higher levels of affective symptoms. A similar absence of differences in anxiety and depressive symptoms across exposure groups has been reported in studies conducted during later phases of the pandemic, when acute epidemiological uncertainty and perceived threat had begun to subside [18].

In contrast to affective symptoms, healthcare workers involved in COVID-19 care demonstrated significantly higher levels of burnout compared with their colleagues not engaged in COVID-19-related work. This finding points to a specific association between professional exposure and chronic dimensions of mental health, rather than transient emotional distress. Previous studies have also documented a substantial burden of burnout and other mental health symptoms among frontline healthcare workers during the COVID-19 pandemic [19].

Further analysis of work intensity among healthcare workers exposed to COVID-19 patients revealed statistically significant positive associations between burnout levels and both the number of working days per week and the number of working hours per day. These associations were not observed for anxiety or depressive symptoms. This pattern supports the concept of burnout as a cumulative outcome of prolonged workload and sustained organizational demands, whereas affective symptoms may be more closely linked to acute stressors. Similar findings have been reported in studies demonstrating stronger associations between extended working hours, persistent workplace stressors, and burnout compared with anxiety or depression [20].

Comparison between the pandemic period (2021) and the post-pandemic period (2023) showed a significant reduction in anxiety and depressive symptoms, while burnout levels remained largely unchanged. This temporal pattern suggests that affective symptoms may diminish as exter-

nal stressors and uncertainty resolve, whereas professional exhaustion persists beyond the acute phase of a public health crisis. A similar dissociation between occupational burnout and other forms of psychological distress has been observed in longitudinal research, with burnout remaining stable while some psychological symptoms decreased over time [21].

Regarding organizational factors, healthcare workers involved in COVID-19 care more frequently reported better cooperation with colleagues and stable or higher income during the pandemic. Despite these potentially protective factors, this group exhibited higher burnout levels. This finding indicates that favorable organizational or financial conditions alone may be insufficient to offset the effects of prolonged and intensive workload. Similar observations have been reported in studies showing that even supportive organizational environments do not fully prevent burnout among the most heavily burdened healthcare workers [22].

Several methodological limitations should be acknowledged. First, the repeated cross-sectional design does not permit individual-level longitudinal inference because the participants in 2021 and 2023 were not necessarily the same individuals. Second, the study was conducted in a single primary healthcare institution, which may limit the generalizability of the findings. Third, all outcomes were assessed using self-report instruments, which may be influenced by reporting bias. Nevertheless, using two structurally comparable samples from the same organizational setting provides a useful population-level comparison of mental health outcomes during and after the pandemic.

Conclusion

In conclusion, the findings of this study indicate that reductions in anxiety and depressive symptoms in the post-pandemic period were not accompanied by a parallel reduction in burnout among primary healthcare workers. Burnout remained more pronounced among healthcare professionals who were intensively involved in COVID-19 care and was closely associated with workload intensity. These findings support the need for long-term organizatio-

nal strategies focused on workload management, staffing, and occupational well-being in primary healthcare beyond short-term crisis response.

Ethics Statement

The study was conducted in accordance with the Declaration of Helsinki. Ethical approval and informed consent were not required due to the anonymous and observational nature of the study.

Acknowledgements

The authors would like to thank all healthcare workers of the Mostar Health Center who participated in the study.

Authors declare no conflict of interest.

Nema sukoba interesa.

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