

PREVALENCE OF DEPRESSIVE SYMPTOMS IN EMPLOYEES IN A TERTIARY HEALTHCARE INSTITUTION IN BELGRADE DURING THE COVID-19 PANDEMIC

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Increased work engagement during COVID-19 pandemic has certainly damaged the health of workers in healthcare institutions. The aim of this paper was to determine the quality of life of employees and the presence of depressive symptoms after contracting Covid-19. A panel longitudinal study was conducted (following two times periods in 2020 and 2021 from March to May) among employees at the Belgrade Institute of Neonatology, using the following questionnaires: Patient Health Quality 9 (PHQ-9) for self-assessment of depressive symptoms; EuroQol-visual analogue scale (EQ VAS) for self-assessment of health condition and socio-descriptive characteristics of respondents were collected through a general questionnaire. Only fully completed questionnaires were included in the study, and that number was 138. There were a total of 138 participants (6 men and 132 women). Women were more represented (95.6%) and (66.0%) respondents were married and had a university education. The average value of the score of the PHQ-9 questionnaire for all employees in 2020 was 5.54 + 4.9. We determined that more than half of the employees, 77 (56.0%), had no depressive symptoms, that is, they had a score in the interval of 0-4 points, 30 employees (21.3%) had a score of 5 – 9, 22 employees (16.0%) scored 10 – 14, 7 employees (5.1%) 15 – 19 and score ≥ 20 had two employees (1.4%). In 2021, average value of the score of the PHQ-9 questionnaire for all employees was 3.8 + 5.12. Without depressive symptoms, there were 70.30% of employees with a score of 0 – 4, which is significantly more ($p < 0.01$) than in 2020. In all categories, from the mildest subclinical upper score of 5 – 9 to the most severe ≥ 20 , depressive symptoms were almost 50% less prevalent among employees in 2021. *Acta Medica Medianae* 2023;62(1):42-49.

Key words: COVID-19, healthcare workers, symptoms of depression

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Introduction

The importance of the well-being and mental health of health workers as one of the risk occupational groups was in focus even before the COVID-19 pandemic occurred. Numerous studies have been conducted (1, 2) in which it was found that health workers are more exposed to stressors related to work compared to other professions. Some of these stressors include: long hours, ex-

tensive workloads, the growing intensity and complexity of the job, relentless contact with patient, high level of responsibility, rapid change within healthcare, institutional constraints such as discrimination and intimidation, lack of autonomy, low levels of support, loss of job satisfaction, low morale and inability to attend to their personal lives (1).

On January 30 2020, the world health organization (WHO) declared the coronavirus disease 2019 (COVID-19) outbreak a Public Health Emergency of International Concern, its highest level of alarm. An unparalleled global response followed, with local and national "lockdowns", quarantines, travel restrictions, and physical distancing measures introduced in attempts to curb transmission rates (3).

Scholars have found that healthcare workers suffered significant mental health problems during the COVID-19 outbreak. For example, medical workers were more likely to develop psychosocial

problems than non-medical workers were. Moreover, the front-line medical staff in close contact with infected patients were more likely to suffer anxiety and depression than administrative staff and the general public. However, there is a lack of evidence in the literature regarding the mechanism of those risk factors on mental health problems among healthcare workers (4).

The new infectious disease, Covid-19, first appeared on the territory of the Republic of Serbia on March 6, 2020. Medical and non-medical staff in the conditions of the COVID-19 did not have much information, but health workers were required to provide maximum physical engagement and to learn daily about personal protection equipment, its use, as well as to familiarize with the method of treatment and care of patients with COVID-19. In their daily work in COVID as well as in non COVID zones, employees were in risk of contracting infection with the new coronavirus SARS-CoV-2 (COVID-19) and death. Increased work engagement has certainly impaired the health of employees, significantly changed the organization of work and lifestyle, and the main goal of this research is to determine some of the consequences of these changes, such as the presence of symptoms of depression.

Material and methods

The research was conducted as a panel longitudinal study (following two time periods in 2020 and 2021, March-May) in the period from July 28, to September 24, 2022 and the population of respondents was represented by all employees of the Belgrade Institute of Neonatology. The criteria for inclusion of respondents in the research were the following: adults (> 18 years), permanent employment in the mentioned institution and voluntary consent to participate in the study. Exclusion criteria: workers who were in the process of resolving their work status or obtaining a license, discontinuity in work for more than a year, and persons who refused to participate. Before the start of the research, a meeting was held where all respondents were informed in detail about the purpose of the research and consent was obtained for conducting the research by the Ethics Committee of the Institute of Neonatology No: 2487/3 date 12.07.2021. The data for this study were obtained by voluntary filling of anonymous questionnaires by the respondents.

For the purpose of this research, a general questionnaire was constructed and two more were used: PHQ-9 and EQ VAS.

The general questionnaire contains 20 questions and was used to collect the basic socio-descriptive data of the respondents (gender, age, marital status, education level, length of service/higher position in institution, shift work, satisfaction with working conditions, number of hours of sleep, illness from COVID-19).

The PHQ-9 contains 9 questions to which respondents answer by circling one of the provided answers. The answer to each question out of 9 questions on a four-point Likert scale is scored 0 – 3 (not at all = 0, a few days = 1, more than half a day = 2, almost every day = 3), the points are also added depending on the height score, the severity of depressive episode is assessed (0 – 4 no depressive symptoms, 5 – 9 subclinical form of depression, 10 – 14 mild depressive episode, 15 – 19 moderately severe and > 20 indicates severe depressive episode).

The EQ VAS scale is an instrument used for self-assessment of health status. To help respondents rate how good or bad their health is, we drew a scale (which looks like a thermometer) on which we marked the best imaginable state with 100 and the worst imaginable state with 0. We asked respondents to show us on a scale how good or bad their state of health was at the time of the study by drawing a line from the black cube that says "Your state of health today" to a point on the scale that best describes how good or bad their state of health is. The obtained values of the EQ VAS scale in the respondents for the period March-May in 2020 and 2021 were processed using the analysis of variance for repeated measurements.

Statistical analysis

Statistical analysis of data was done using statistical package SPSS 20.0 for Windows. All continuous variables are given as means \pm standard deviations (SD). Average values of continuous variables in the two tested groups were compared by means of Student's t-test and Chi-square test was used to examine the differences of categorical variables. Spearman's correlation coefficient (ρ) was used for measurement of the strength and direction of association between two ranked variables. Assessment error less than 5% ($p < 0.05$) was accepted as the threshold of statistical significance.

Results

A total of 138 respondents (6 men and 132 women) participated in the study. Women were more represented (95.6%) than men (4.4%) and the difference was statistically significant. The average age of all respondents was 40.10 ± 11.4 years and ranged from 21 to 66 years, and the most respondents were in the age group 20 - 39 77 (55.8%).

The highest percentage of employees were married (66.0%), i.e. 91 of them, 27 (19.4%) were single, five (3.6%) were divorced, two (1.4%) were widows and 12 (8.6%) did not give an answer. Ninety-one employees (66.0%) had a university education, one (1%) completed three-year high school, 12 (9%) completed four-year high school, 15 (11%) had Bachelor's degree, 10

(7%) had specialization, 5 (3%) had subspecialty training, one (1%) had academic title and 3 (2%) did not give any answer. The average length of service for all employees was 15.2 years \pm 11.2 and ranged from 1 month to 42 years. The largest number of respondents, 49 (35.5%), had a length of service of less than ten years, followed by a total of 45 employees (32.6%) with a length of service of 10 to 19 years, and the least respondents, only two (1.4%) were with 40 to 49 years of work experience. Only 17 (13.7%) respondents held a managerial position.

Most respondents worked in shifts, 94 (68.1%). 46 respondents (33.4%) did not answer about the length of the shift, and 91 (65.9%) respondents worked from 6 to 12 hours, and one (0.72%) stated that they worked 18 hours. The average working time of the employees was 7.84 hours \pm 5.64 and ranged from 0 to 18 hours. The largest number of employees, 88 (63.7%), were satisfied with the working conditions, while there was the same number of employees – 25 (18.1%) who did not give a precise answer to this question and were unsatisfied with the working conditions (Table 1).

Table1. Socio-descriptive characteristics of employees

Socio-descriptive characteristics		N	(%)
Gender	Male	6	4.4
	Female	132	95.6
Age	20 – 39	77	55.8
	40 – 59	54	39.1
	\geq 60	7	5.0
Marital status	Married	91	65.5
	Single	27	19.4
	No answer	12	8.6
	Divorced	5	3.6
	Widow/widower	2	1.4
Education	Three-year high school	1	1.0
	Four-year high school	12	9.0
	Bachelor	15	11.0
	College	91	66.0
	Academic title	1	1.0
	Specialization	10	7.0
	Subspecialty	5	3.0
	No answer	3	2.0
Occupation	Medical doctor	21	15.3
	Nurse/medical technician	111	80.4
	Tech staff	3	2.3
	Administrative workers	1	0.7
	No answer	2	1.4
Higher position in company	Yes	17	13.7
	No	121	86.3
Working in shifts	Yes	94	68.1
	No	44	31.8
Duration of working hours	No answer	46	33.4
	6 - 12*	91	65.9
	$>$ 12	1	0.72
Satisfaction with working conditions	Yes	88	63.7
	No	25	18.1
	Neither	25	18.1
Hours of sleep	< 6 hours	45	32.6
	6 - 8 hours	92	66.7
	> 8 hours	1	0.7
Length of vacation per year	< 20	8	5.8
	\geq 20	4	2.9
	\geq 30	70	50.7
	\geq 40	56	40.6
Years of employment	> 10	49	35.5
	10 - 19	45	32.6
	40 - 49	2	1.4

*Length of working time in hours

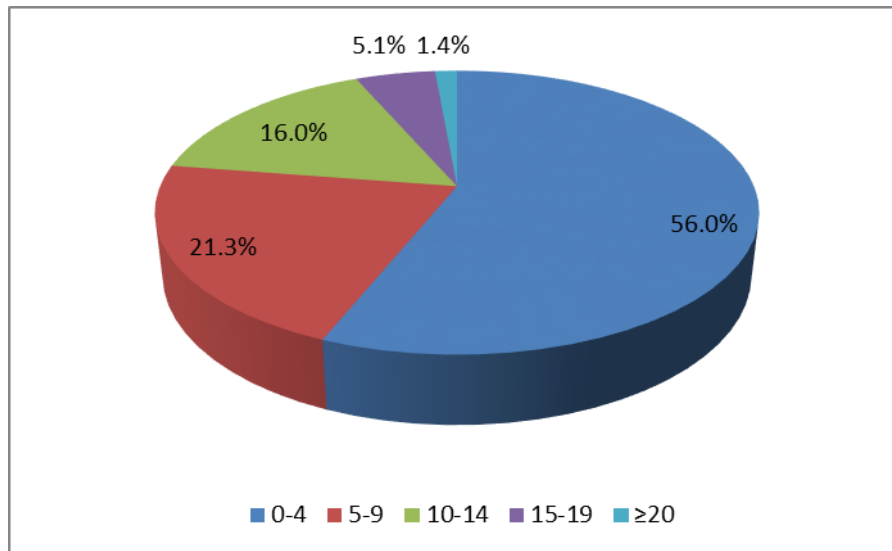


Figure 1. Distribution of employees according to the score in the PHQ-9 questionnaire in March, April and May of 2020

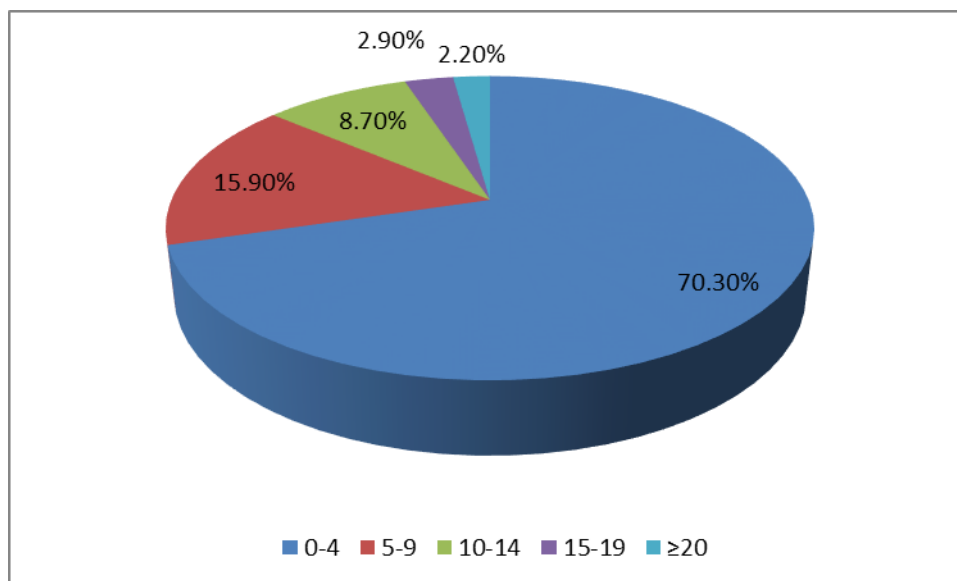


Figure 2. Distribution of employees according to the score in the PHQ-9 questionnaire in March, April and May 2021

The average length of vacation was 35.90 days \pm 7.42 and ranged from 0 to 49 days. The largest number of employees, 92 (66.7%), slept 6 – 8 hours during 24 hours, and only one person slept more than 8 hours. Twenty-one respondents were infected with COVID-19. Fifteen point three percent were doctors, 80.4% were nurses/technicians, 2.3% were members of technical staff, 0.7% were administrative workers and 1.4% did not give an answer regarding their occupation. Eighty-seven respondents (63.4%) were vaccinated against COVID-19.

The average value of the score in the PHQ-9 questionnaire for all employees in 2020 was 5.54 ± 4.9 . After analyzing the responses of employees from the first three months of 2020, it was determined that more than half of the employees, 77 (56.0%), had no depressive symptoms, that is, they had a score in the interval (0 – 4 points), 30 employees had a score of 5 – 9 (21.3%), 22 employees (16.0%) had a score of 10 – 14, 7 employees (5.1%) had a score of 15 – 19 and two employees (1.4%) had a score ≥ 20 (Figure 1).

The average of the score in the PHQ-9 questionnaire for all employees in 2021 was $3.8 \pm$

5.12. Without depressive symptoms, there were 70.30% of employees with a score of 0 – 4, which is significantly more ($p < 0.01$) than in 2020. In all categories, from the mildest subclinical upper score of 5 – 9 to the most severe ≥ 20 , depressive symptoms were almost 50% less prevalent among employees in 2021 (Figure 2) than in 2020 (Figure 1).

The average PHQ-9 score in 2021 was 3.8 ± 5.12 and the decrease in the average PHQ-9 score compared to 2020 in health workers was statistically significant ($p = 0.0036$). Using Spearman's correlation, the average score of the EQ VAS questionnaire and the length of the duration of the COVID-19 pandemic of the employees was determined to have a statistically significant positive correlation of $r = 0.185$; $n = 138$; $p = 0.001$.

In the period of the first three months of 2020 and 2021, the number of employees without symptoms of depression increased significantly. No statistically significant positive correlation was found between the average score of depression symptoms in the PHQ-9 questionnaire and age, length of service, length of working hours, shift work, and length of rest.

The analysis of variance for repeated measurements showed that during the test, there was no statistically significant increase in EQ VAS values, and only in May 2020, when the smallest number of employees rated their health as the best possible (score 100) that year (Table 2). An increase in EQ VAS scores was recorded from April 2021 compared to 2020, the determined difference was not statistically significant.

Table 2. Average values of the EQ VAS scale among employees in March, April and May 2020 and 2021

Period	Average values EQ VAS		
	2020	2021	p
March	74.27 ± 24.80	74.50 ± 25.76	0.929
April	74.38 ± 24.71	76.11 ± 25.63	0.562
May	77.40 ± 24.01	78.26 ± 25.70	0.758

Discussion

We applied a panel study in order to analyze the quality of life of employees in a tertiary health-care institution and the prevalence of depressive symptoms in two different years. Using two specific and one general questionnaire for data collection, we determined that the average PHQ-9 score for all employees in 2021 was significantly lower, and that two thirds of employees were without symptoms of depression than in 2020.

Healthcare workers (HCWs) worldwide face a high risk of developing mental health problems during COVID-19, in particular frontline, and a

large number of studies confirmed that (3, 4, 5), whereas only a few studies were conducted related to this issue among the population of non-frontline HCWs (5, 6, 7). Because of the above, our study was conducted in a health facility where work non-frontline HCWs, all with the aim of contributing to a better understanding of the impact and consequences of COVID-19 on the mental health of the above mentioned population.

The socio-descriptive characteristics of the respondents of our study indicate that there were more women (95.6%). The average age of all respondents was $40.10 + 11.4$ years, and the largest percentage of respondents 77 (55.8%) belonged to the age group of 20 – 39 years. Ninety-one respondents (66%) were married and had university education. Forty-nine respondents (35.5%) had less than 10 years of work experience, and 94 respondents (68.1%) worked in shifts. Health workers (doctors, nurses) made up to 95.7% of respondents, 1.4% did not answer and the other 3% of respondents were technical and administrative workers. Eighty-seven respondents (63.04%) were vaccinated against COVID-19.

An administrative cross-sectional survey was conducted by Osaka local government from May 27, to July 23, 2020. All 1269 HCWs (1060 non-frontline, 209 frontline) from three hospitals in Osaka participated in the survey. The majority of the respondents (44%) were 30 – 49 years of age, (75%) female, (7%) and (55%) physicians and nurses and 610 (48%) had a career length > 10 years. Socio-descriptive characteristics of the respondents in this study are similar to ours, except for the length of work experience. The majority of respondents in this study were without depressive symptoms 1088 (86%), while 181 (14%) exhibited depressive symptoms (PHQ-9 > 10) (5). In our study, in 2021, 97 (70.30%) respondents were without symptoms and 41 (29.7%) had symptoms from subclinical to severe depression form.

The cross-sectional study was conducted between May 1, 2021 and August 31, 2021. Participants were psychiatric HCWs working at the Department of Psychological Medicine, University Malaya Medical Centre (UMMC). This online survey was completed by 177 (132 non-frontline, 41 frontline) HCWs. The mean age of the respondents was 36.5 years old (SD = 8.1). Most respondents were female, married, doctors, nurses and 5% of respondents were administrative staff members. More than four-fifths of the respondents received their COVID-19 vaccination. These data correspond to the results of our research. Depressive symptoms (HADS > 8) were reported by 29 psychiatric HCWs (16.7%). Respondents who were experiencing financial hardship were unvaccinated and those who had a shorter duration of service in the psychiatric department had a higher level of depressive symptoms (6). In our research, no connection was established between the socio-descriptive characteristics respondents and the increased level of depressive symptoms.

A comparative cross-sectional study was conducted in two government hospitals managing COVID-19-related cases in Kelantan, Malaysia from May to July 2020, in which 306 healthcare providers (146 non-frontline, 160 frontline) participated. The majority of the healthcare providers were, like in our study, female 141 (88.1%), had diploma education 134 (83.8%) and were married 133 (83.1). But unlike our respondents, they did not work in shifts. The level of depressive symptoms (HADS score > 8) was 27.5% for the frontline healthcare providers and 37.7% for the non-frontline healthcare providers. The mean depressive symptoms score for the non-frontline healthcare providers was 0.75 points higher than that of frontline healthcare providers after adjusting gender, duration of employment and social support (7).

One of the first repeated multi country analysis of the mental wellbeing of medical doctors (n = 5,275) was conducted in Catalonia, Italy and UK at two time points during the COVID-19 pandemic (June 2020 and November/December 2020) in order to understand the prevalence of anxiety and depression, as well as associated risk factors. Rate of depression were highest in Italy (20.1%), second highest in Catalonia (17.4%) and lowest in the UK (13.7%). Across all countries, higher risk of anxiety and depression symptoms were found among women, individuals below 60 years old, those felling vulnerable/exposed at work, and those reporting normal/below-normal health (8).

In a healthcare setting in Oman, a cross-sectional study was conducted during COVID-19 pandemic, from April 8 to 17, 2020, in which a mental health status of 1,139 healthcare workers (574 frontline) and (565 non-frontline) was assessed. Healthcare workers reported to have depression (32.3%), anxiety (34.1%), stress and insomnia (23.8% and 18.5%). No significant differences in depression status were found between the frontline and non-frontline groups (9).

Between March 27 and March 31, 2020 in Italy, during COVID-19 pandemic, a cross-sectional study was conducted in healthcare workers to assess mental health outcomes (PTSS, depression, anxiety, insomnia, perceived stress). Fifty-two point five seven percent of frontline and 27.35% of second-line HCWs were included in study. Results are in line with previous reports from China, confirming a substantial proportion of mental health issues, particularly among young women and frontline HCWs (10).

A scoping review regarding mental healthcare consequences for HCWs found that high number of depression symptoms and anxiety was present at HCWs. Further, there were differences in symptoms by sex, age, and HCW role, with female, younger-age, frontline workers, and non-physician workers being affected more than other subgroups (11).

In the period from July 25 to August 25, 2021, a survey was conducted among primary care health workers from Sarajevo canton and

other cantons of Bosnia and Herzegovina. The results of this study confirmed the existence of increased stress, anxiety, depression and fear among HCWs. A great influence on the mental health of employees was working with some of colleagues who had had a more severe form of COVID-19 (70%), and one of most significant stressors that influenced HCWs mental health was the death of a colleague during COVID-19 pandemic (24%) (12).

Survey conducted about characteristics of work-related COVID-19 in Croatian HCWs (between May 1, 2020 and November 12, 2020) suggest that this disease is most common in hospital nurses, laboratory technicians and takes a mild form (13).

During the COVID-19 outbreak in Serbia, a study was conducted with the aim to assess the impact of outbreak-related information and public trust in the health system and preventive measures in 2020 on the levels of anxiety and depression in education, army and healthcare professionals. Among healthcare workers, average level of anxiety and the frequency of perceiving outbreak-related information available in public media as disturbing were higher compared to the group of army professionals. The lack of public trust was associated with higher levels of depression (14).

Between April 18, and May 24, 2020, an international cross-sectional study was conducted in 41 countries, including China, UK and USA. Of all participants (2,527), 1,343 (57.1%) were aged 26 to 40 years, 2,021 (80.0%) were female, 874 (34.6%) were doctors and 1,367 (54.1%) were nurses. Factors associated with an increased likelihood of depressive symptoms were working in the UK and the US, being female, being a nurse and caring for a COVID-19 positive patient who subsequently died (15).

As we can see, many studies reported depression as one of the parameters of mental health problems among healthcare providers during the COVID-19 pandemic. The reported pooled prevalence of depression among healthcare providers in 11 studies from China, West Bengal, India and Singapore was 30.2% and 22.8% in 10 studies conducted in China and Singapore (7).

The reasons of significantly increased number of respondents without symptoms of depression in 2021 compared to 2020 in our study can be various: purchase of personal protection and its constant use, introduction of mandatory preventive measures, new treatment protocols, vaccination etc.

Conclusion

According to the presented results, a significantly smaller number of employees had symptoms of depression. Despite the duration of the pandemic, there was a decrease in the average prevalence of depressive symptoms among employees.

Based on all of the above, we can conclude that mental health problems in the form of depressive symptoms are also present in the non-frontline healthcare workers. In some studies, the connection between the increased level of depressive symptoms and certain socio-descriptive characteristics of this population of respondents

was determined. In our opinion, the obtained results indicate the need for further detailed research on the impact of COVID-19 on the mental health of non-frontline healthcare workers and the possible connection of the socio-descriptive characteristics of respondents with more frequent occurrence of depressive symptoms.

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doi: 10.5633/amm.2023.0106**ZASTUPLJENOST DEPRESIVNIH SIMPTOMA KOD
ZAPOSLENIH U ZDRAVSTVENOJ USTANOVI
TERCIJARNOG TIPA U BEOGRADU TOKOM PANDEMIJE
VIRUSA COVID-19***Sonja Giljača¹, Slavica Maris¹, Milica Ranković – Janevski²,
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Povećano radno angažovanje tokom pandemije virusa COVID-19 sigurno je narušilo zdravlje zaposlenih u zdravstvenim ustanovama. Cilj ovoga rada jeste da se utvrde neke od posledica navedenih zdravstvenih promena. Sprovedena je panel longitudinalna studija (za dva vremeska perioda: 2020. i 2021. godinu od marta do maja meseca) kod zaposlenih u Institutu za neonatologiju Beograd, primenom upitnika PHQ-9 za samoprocenu depresivnih simptoma, EQVAS za samoprocenu zdravstvenog stanja i opštim upitnikom prikupljeni su socijalni podaci ispitanika, dati deskriptivno. Ukupna vrednost skora PHQ-9 upitnika za sve zaposlene u 2020. godini iznosila je 5,54 + 4,9, a u 2021. godini 3,8 + 5,12. Zastupljenije su bile žene (95,6%), a 66,0% ispitanika bilo je u braku i univerzitetskog obrazovanja. *Acta Medica Medianae 2023;62(1): 42-49.*

Ključne reči: COVID-19, zdravstveni radnici, simptomi depresije

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