ORIGINAL SCIENTIFIC PAPER

ANALYSIS OF STRESS EXPOSURE AMONG EMPLOYEES OF THE INSTITUTE OF PUBLIC HEALTH OF SERBIA "DR MILAN JOVANOVIĆ BATUT" DURING THE SARS-COV-2 PANDEMIC

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ABSTRACT

Stress plays a crucial role in individual health and significantly contributes to the burden of disease. The COVID-19 pandemic brought numerous challenges to healthcare workers, causing psychosomatic and social disruptions. Healthcare employees were at high risk due to exposure to infection and increased workload. This study examines stress exposure, anxiety, depression, among employees of the Institute of Public Health of Serbia during the COVID-19 pandemic.A total of 220 employees participated in the study, which used a structured questionnaire assessing demographic data, work conditions, and self-reported stress, depression, and anxiety (DASS-21 scale). Factors such as age, gender, work experience, direct patient contact, and COVID-19 in close contacts were examined. Data were statistically analyzed.Most participants reported increased stress and work demands during the pandemic. Over two-thirds had documented COVID-19, with many experiencing multiple infections. Stress was linked to direct patient contact and having a family member with COVID-19. Depression was influenced by age and work experience, while anxiety was more prevalent in younger participants with fewer years of work experience and was associated with alcohol consumption.

***Keywords**: SARS-CoV-2, COVID-19 pandemic, stress, depresion and anxiety, human resources , education, Serbia*

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INTRODUCTION

The World Health Organization (WHO) received information about an outbreak of pneumonia of unknown origin in the city of Wuhan, China, on December 31, 2019. Chinese authorities identified the new virus on January 7, 2020, and it was temporarily named 2019-nCoV, before being officially identified on February 11 as the SARS-CoV-2 virus [1][2][3]. On January 30, 2020, the Director-General of WHO declared COVID-19 a public health emergency of international concern (PHEIC). The first laboratory-confirmed case of COVID-19 in the Republic of Serbia was registered on March 6, 2020 [4][5]. In line with the evolving epidemiological situation of COVID-19, first in the People's Republic of China and later in other countries, the Institute of Public Health of Serbia "Dr Milan Jovanović Batut" began informing the domestic and professional public in January 2020, following the first reports about the pandemic in China [6][7][8].

From the very beginning of the crisis caused by the virus, the Institute played a major role in public health information, organizing healthcare institutions, preparing guidelines for handling travelers in international transport, COVID-19 testing (even during early morning hours), and later, vaccination and mass vaccination [9]. Given the current epidemiological situation related to the SARS-CoV-2 virus, the Institute/Public Health Institute of Serbia has been on duty since February 28, 2020 [10][11]. Consequently, employees of the Institute for Public Health of Serbia faced various challenges that had not existed before—encountering an unknown disease, the reorganization of services, concern for their own health, their colleagues, patients, family, intensive work, and overload [12].

In addition to the significant impact of the disease caused by the SARS-CoV-2 virus at the end of 2019 on physical health, social functioning, and the economy, this public health issue also had a significant impact on mental health, affecting not only the patients infected with the virus but also healthcare workers at various levels of the healthcare system [13]. The World Health Organization (WHO) has defined mental health as "a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community" [14][15]. What is often associated with mental health are stressful situations in which workers find themselves. Symptoms related to mental health problems primarily include depression, anxiety, and stress.

This can lead to additional cognitive and social problems, as well as long-term issues, including post-traumatic stress disorder [16]. Within the care for mental health, significant importance is placed on measuring general emotional well-being [17].

Depression, anxiety, and stress are recognized as some of the main health problems, and research interest is focused on understanding their nature, patterns, and treatments [18][19].

The COVID-19 pandemic has profoundly changed social and work environments. Workplace factors can play a crucial role in alleviating or worsening the mental health of individuals confronted with such a pandemic scenario. Individuals providing healthcare face acute stress in all organizations within the healthcare system. The COVID-19 pandemic has posed unprecedented challenges to the healthcare system worldwide [20].

For employees in healthcare institutions, epidemics or pandemics present special challenges due to the unknown methods of treatment, social isolation after the first symptoms appear, as well as concerns for the safety of patients, themselves, and their loved ones. Therefore, this paper focuses on the employees of the Institute for Public Health of Serbia and the amount of stress they experienced during the COVID-19 pandemic and its impact on their health status.

METHODOLOGY

STUDY POPULATION

A cross-sectional study included 220 adult participants employed at the Institute of Public Health of Serbia during the COVID-19 pandemic. Subjects with part-time contractst and those that had absence from work-place longer than six months during the pandemic were excluded from the study. Additional exclusion criteria was pre-existing mental disorder.

DATA COLLECTION

Data were collected through self-assessment using specially designed questioneer, after thorough instructions provided by the researchers. The questionairre consisted of demographic and socio-economic data, heatlh and well-being, work-place and COVID-19 related informations (Tables 1 and 2).

Depression Anxiety Stress Scale 21 (DASS-21) was used to access depression, anxiety and stress levels. The self-assessment scale consisted of seven questions for each of the three subscales. For every individual question participants expressed their feelings using the Likert scale, with "0" meaning "not at all" and "3" meaning "always". Depression, anxiety and stress scores were quantified into five categories: normal, mild, moderate, severe, and extremely severe.

STATISTICAL ANALYSIS

Statistical analysis was performed using the SPSS statistical package, version 25.0 (IBM corporation, Armonk, NY, USA). Equality of distribution of continuous variables was tested using the Kolmogorov-Smirnov test. The results are shown through tables and figures, and variables presented as median values with interquartal range (IQR) for continous data, or as percentages with number of cases (N) for categorical variables. Differences in quantitative data were tested using the Mann-Whitney U test. Differences between the groups were analyzed with the χ 2 test of independence analysis or by Fisher's exact test if assumptions for the $\chi 2$ test were not met. "P" values < 0.05 were considered significant.

The study was approved by the Ethics Committee of the Institute under reference number 4992/1. Written informed consent for participation in the study was obtained from all study subjects. The research was conducted during the period between 2023. and 2024.

RESULTS

The cohort included 220 adult participants working at Institute for public health of Serbia during the COVID-19 pandemic. The median age was 43.0 years and the cohort consisted mostly of female subjects (76.9%). Majority of participants had higher level of education and did not have significant financial issues (Table 1). During the pandemic, less than 1% of participants have worked exclusively from home and more than half have had direct contact with patients (54.5%). According to self-assessment, majority of subjects perceived work-place requirements to be more demanding (86.2%) and more stressful (78.6%) compared to pre-COVID period. More than two-thirds of participants had documented COVID-19 (71.8%), of which 55.5% had multiple infections and 8.9% required inpatient treatment. In addition, 85.0% had a family member/close friend with documented COVID-19 and 26.8% reported a fatal outcome due to the disease (Table 2).

In the DASS-21 scales analysis, we note that majority of participants reported normal levels of stress and depressive emotions, followed by mild and moderate levels (Figures 1 and 2). Having direct contact with patients and documented COVID-19 of a family member/close friend were only factors associated with increased stressfulness (Table 3). Depression levels were significantly influenced by age and working years; participants with mild depression were significantly older compared to those with normal and moderate to extremely severe depression (p 0.024 and 0.010, respectively) and had longer work-place experience (p 0.048 and 0.011, respectively) (Table 4). The most heterogeneous distribution was seen in the anxiety subscale, where almost half of the participants were classified as abnormal (Figure 3). We note that participants classified with moderate to extremely severe anxiety were significantly younger compared to those with no or mild anxiety (p 0.002 and 0.002, respectively), and had less working years as well (p 0.006 and 0.003, respectively). In addition, increased anxiety was associated with alcohol consumption (Table 5).

Table 1. Cohort chatacteristics

Variable		Median (IQR) or percentage of cases (N)
Sex	Male	51 (23.1)
	Female	169 (76.9)
Age [years]		43.0 (24.0)
Chronic somatic ilness	Yes	44.1% (97)
	No	55.9% (123)
Marital status	Unmarried	24.5% (54)
	Married	70.9% (156)
	Divorced	4.5% (10)
	Widow	0% (0)
Level of education	Elementary school	0 (0%)
	High school	16.8% (37)
	Applied studies	0.5% (1)
	Faculty	68.2% (150)
	Master's studies	11.8% (26)
	PhD	2.7% (6)
Financial status	Not enough for basic needs	5.5% (12)
	Enough for basic needs	23.2% (51)
	Enough for basic needs and smaller additional expenses	36.4% (80)
	Enough for basic needs and larger additional expenses	14.2% (31)
	No financial issues	20.5% (45)
Use of alcohol	Yes	79.5% (175)
	No	20.5% (45)
Use of cigarettes/nicotine products	Yes	54.5% (120)
	No	45.5% (100)
Use of sedatives	Yes	88.2% (194)
	No	11.8% (26)

Table 2. Workplace and COVID19-related information

Variable		**Median (IQR) or percentage of cases (N)**
Working years [years]		13,0 (6-25)
Satisfaction with workplace environment	Very satisfied	14.1% (31)
	Satisfied	73.2% (161)
	Nor satisfied nor unsatisfied	9.5% (21)
	Unsatisfied	2.3% (5)
	Very unsatisfied	0.9% (2)
Workplace during the pandemic	Exclusively from home	0.9% (2)
	Exclusively from office	11.9% (26)
	Both from home and office	87.3% (192)
Direct contact with patients during the pandemic	Yes	54.5% (120)
	No	44.5% (100)
Frequency of work-place requirements during the pandemic compared to common requirements	Significantly less	0% (0)
	Less	2.7% (6)
	The same	10.5% (23)
	More	29.1% (64)
	Significantly more	57.7% (127)
Stressfulness of work-place requirements during the pandemic compared to common requirements	Significantly less	2.3% (5)
	Less	3.6% (8)
	The same	15.5% (34)
	More	19.5% (43)
	Significantly more	59.1% (130)
Professional mental help during the pandemic	Yes	5.5% (12)
	No	94.5% (208)
Documented COVID-19	Yes	71.8% (158)
	No	25.2% (62)
Number of COVID-19 infections	None	25.2% (62)
	One	32.5% (71)
	Two	30.4% (68)
	Three or more	8.8% (19)
Hospitalization due to COVID-19	Yes	6.4% (14)
	No	93.6% (206)
Documented COVID-19 of a family member/close person	Yes	187 (85.0%)
	No	33 (15.0%)
Loss of a family member/close person due to COVID-19	Yes	26.8% (59)
	No	73.2% (161)

Table 3. Association of predictive variables with DASS-21 stress scale

Variable		Median (IQR) or percentage of cases (N)			P
		Normal	Mild	Moderate to extremelly severe	
Age [years]		42.0 (25.0) - 43.15	43.0 (23.0) - 41.6	47.5 (20.0) - 47.9	0.186
Sex	Male	22.3% (35)	27.9% (12)	20.0% (4)	0.697
	Female	77.7% (122)	72.1% (31)	80.0% (16)	
Chronic somatic ilness	Yes	43.3% (68)	44.2% (19)	50.0% (10)	0.638
	No	56.7% (89)	55.8% (24)	50.0% (10)	
Use of alchohol	Yes	79.6% (125)	79.1% (34)	80.0% (16)	0.995
	No	20.4% (32)	20.9% (9)	20.0% (4)	
Use of sedatives	Yes	87.3% (137)	90.7% (39)	90.0% (18)	0.798
	No	12.7% (20)	9.3% (4)	10.0% (2)	
Working years [years]		12.5 (19.0) - 15.9	10.0 (18.0) - 14.4	20.0 (22.5) - 20.4	0.102
Direct contact with patients during the pandemic	Yes	48.7% (75)	69.8% (30)	75.0% (15)	0.045*
	No	51.3% (79)	30.2% (13)	25.0% (5)	
Frequency of work-place requirements during the pandemic compared to common requirements	(significantly) less	3.2% (5)	2.3% (1)	0.0% (0)	0.621
	The same	8.9% (14)	16.3% (7)	10.0% (2)	
	(significantly) more	87.9% (138)	81.4% (35)	90.0% (18)	
Stressfulness of work-place requirements during the pandemic compared to common requirements	(significantly) less	5.7% (9)	9.3% (4)	0.0% (0)	0.604
	The same	14.6% (23)	18.6% (8)	15.0% (3)	
	(significantly) more	79.6% (125)	72.1% (31)	85.0% (17)	
Documented COVID-19	Yes	70.7% (111)	72.1% (31)	80.0% (16)	0.684
	No	29.3% (46)	27.9% (12)	20.0% (4)	
Hospitalization due to COVID-19	Yes	4.5% (7)	9.3% (4)	15.0% (3)	0.130
	No	95.5% (150)	90.7% (39)	80.0% (17)	
Documented COVID-19 of a family member/close person	Yes	86.6% (136)	95.3% (41)	100% (20)	0.046*
	No	13.4% (21)	4.7% (2)	0% (0)	
Loss of a family member/close person due to COVID-19	Yes	26.8% (42)	27.9% (12)	25.0% (5)	0.970
	No	73.2% (115)	72.1% (31)	75.0% (15)	

Table 4. Association of predictive variables with DASS-21 depression scale

Variable		Median (IQR) or percentage of cases (N)			P
		Normal	Mild	Moderate to extremelly severe	
Age [years]		41.0 (24.0) - 42.9	52.0 (20.0) - 48.9	38.0 (21.0)- 38.8	0.018*
Sex	Male	22.2% (38)	21.4% (6)	33.3% (7)	0.509
	Female	77.8% (133)	78.6% (22)	66.7% (14)	
Chronic somatic ilness	Yes	45.0% (77)	42.9% (12)	38.1% (8)	0.966
	No	55.0% (94)	57.1% (16)	61.9% (13)	
Use of alchohol	Yes	79.5% (136)	75.0% (21)	85.7% (18)	0.655
	No	20.5% (35)	25.0% (7)	14.3% (3)	
Use of sedatives	Yes	89.5% (153)	82.1% (23)	85.7% (18)	0.502
	No	10.5% (18)	17.9% (5)	14.3% (3)	
Working years [years]		11.5 (16.0) - 15.8	20.5 (17.5) - 20.4	9.0 (11.0) - 11.7	0.036*
Direct contact with patients during the pandemic	Yes	57.1% (96)	50.0% (14)	47.6% (10)	0.591
	No	42.9% (72)	50.0% (14)	52.4% (11)	
Frequency of work-place requirements during the pandemic compared to common requirements	(significantly) less	3.5% (6)	0.0% (0)	0.0% (0)	0.720
	The same	9.9% (17)	10.7% (3)	14.3% (3)	
	(significantly) more	86.5% (148)	89.3% (25)	85.7% (18)	
Stressfulness of work-place requirements during the pandemic compared to common requirements	(significantly) less	6.4% (11)	3.6% (1)	4.8% (1)	0.887
	The same	16.4% (28)	10.7% (3)	14.3% (3)	
	(significantly) more	77.2% (132)	85.7% (24)	81.0% (17)	
Documented COVID-19	Yes	71.3% (122)	67.9% (19)	81.0% (17)	0.576
	No	28.7% (49)	32.1% (9)	19.0% (4)	
Hospitalization due to COVID-19	Yes	6.4% (11)	7.1% (2)	4.8% (1)	0.942
	No	93.6% (160)	92.9% (26)	95.2% (20)	
Documented COVID-19 of a family member/close person	Yes	89.5% (153)	89.3% (25)	90.5% (19)	0.899
	No	10.5% (18)	10.7% (3)	9.5% (2)	
Loss of a family member/close person due to COVID-19	Yes	25.7% (44)	28.6% (8)	33.3% (7)	0.740
	No	74.3% (127)	71.4% (20)	76.7% (14)	

Table 5. Association of predictive variables with DASS-21 anxiety scale

Variable		Median (IQR) or percentage of cases (N)			P
		Normal	Mild	Moderate to extremelly severe	
Age [years]		44.5 (24) - 44.2	48.0 (23) - 45.6	34.5 (17) - 37.9	0.003*
Sex	Male	24.6% (28)	24.1% (14)	18.8% (9)	0.711
	Female	75.4% (86)	75.9% (44)	81.3% (39)	
Chronic somatic ilness	Yes	42.1% (48)	50.0% (29)	41.7% (20)	0.533
	No	57.9% (66)	50.0% (29)	58.3% (28)	
Use of alchohol	Yes	73.3% (84)	81.0% (74)	91.7% (44)	0.033*
	No	26.3% (30)	19.0% (19)	8.3% (4)	
Use of sedatives	Yes	89.5% (102)	91.4% (53)	81.3% (39)	0.227
	No	10.5% (12)	8.6% (5)	18.8% (9)	
Working years [years]		15.0 (20.0) - 16.8	15.5 (17.5) - 17.7	8.0 (11.8) - 12.1	0.009*
Direct contact with patients during the pandemic	Yes	53.5% (61)	53.6% (30)	61.7% (29)	0.608
	No	46.5% (53)	46.4% (26)	38.3% (18)	
Frequency of work-place requirements during the pandemic compared to common requirements	(significantly) less	3.4% (4)	0.0% (0)	4.2% (2)	0.631
	The same	10.5% (12)	12.1% (7)	8.3% (4)	
	(significantly) more	86.1% (98)	87.9% (51)	87.5% (42)	
Stressfulness of work-place requirements during the pandemic compared to common requirements	(significantly) less	5.3% (6)	3.4% (2)	10.4% (5)	0.205
	The same	12.3% (14)	15.5% (9)	22.9% (11)	
	(significantly) more	82.5% (94)	81.1% (47)	66.7% (32)	
Documented COVID-19	Yes	70.2% (80)	77.6% (45)	68.8% (33)	0.515
	No	29.8% (34)	22.4% (13)	31.3% (15)	
Hospitalization due to COVID-19	Yes	7.1% (8)	3.5% (2)	8.3% (4)	0.110
	No	92.9% (106)	96.5% (56)	91.7% (44)	
Documented COVID-19 of a family member/close person	Yes	89.5% (102)	93.1% (54)	85.4% (41)	0.436
	No	10.5% (12)	6.9% (4)	14.6% (7)	
Loss of a family member/close person due to COVID-19	Yes	28.9% (33)	27.6% (16)	20.8% (10)	0.561
	No	71.1% (81)	72.4% (42)	79.2% (38)	

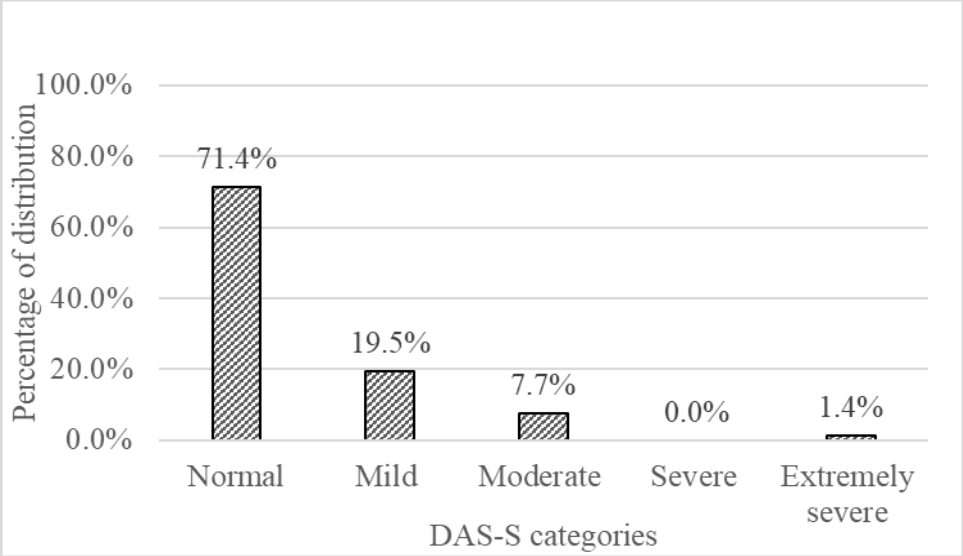

Figure 1. Percentage distribution across the DASS-21 stress categories

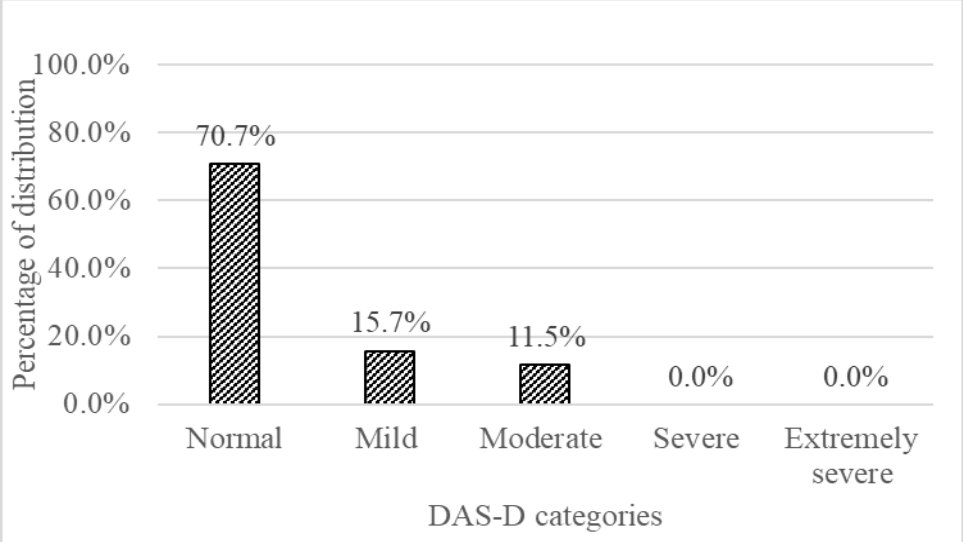

Figure 2. Percentage distribution across the DASS-21 depression categories

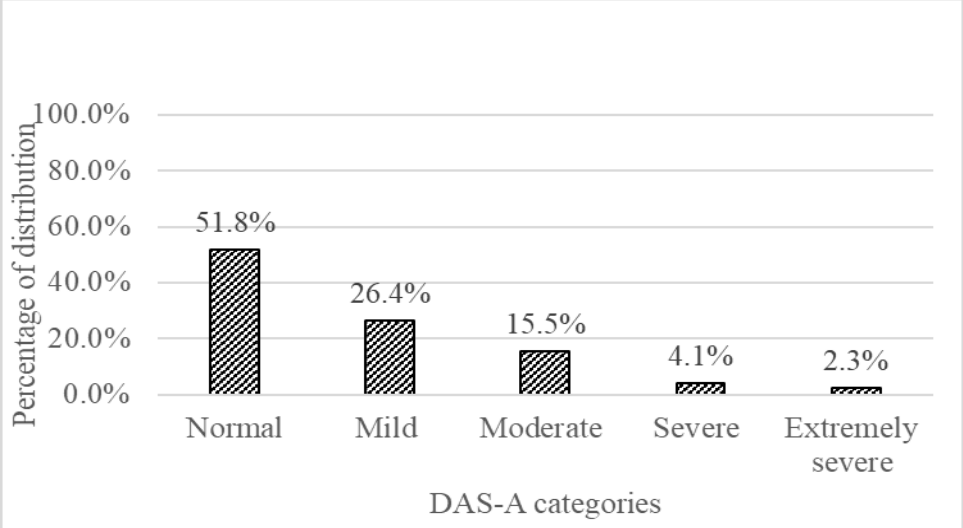

Figure 3. Percentage distribution across the DASS-21 anxiety categorie

DISCUSSION

The data from this study provide valuable insights into the impact of the COVID-19 pandemic on healthcare workers, with a particular focus on the mental health aspects of stress, anxiety, and depression. The findings suggest that stress and workload were significantly prevalent among the majority of the participants, with 86.2% reporting higher demands during the pandemic compared to the pre-pandemic period and 78.6% noting that their work became more stressful. This uniformity in perceptions indicates that these factors were almost universally experienced, which likely reduced the ability to distinguish them as separate predictive variables in the statistical analysis. The overall overwhelming work context across the sample suggests that the workplace itself was a significant source of stress. However, specific factors, such as direct patient contact and the experience of having family members or close individuals diagnosed with COVID-19, were statistically significant in predicting higher stress levels. These findings suggest that the subjective experience of stress was influenced more by personal, experiential factors during the pandemic than by the work environment itself, which was equally demanding for all.

This aligns with findings from other studies that have reported a heightened sense of stress and anxiety among healthcare workers, particularly in the early stages of the pandemic, where exposure to illness and personal risk were high. For instance, studies from Italy and Spain noted that healthcare workers with direct contact with COVID-19 patients exhibited higher levels of stress and anxiety, similar to what was observed in this study among those who had direct patient interaction and were affected by COVID-19 within their family circles. The psychological burden of healthcare workers facing potential exposure to the virus, alongside concerns for their loved ones, appears to have exacerbated feelings of stress. These findings were also corroborated by studies in the UK and the US, where healthcare workers in direct contact with patients had significantly higher rates of mental health symptoms, including depression and anxiety.

In terms of depression, the study found that older employees and those with more work experience reported higher levels of mild depressive symptoms. This finding suggests that these individuals may have accumulated chronic stress over the course of their careers, potentially leading to greater emotional vulnerability during the pandemic.

This is consistent with research from other countries, which found that older healthcare workers, particularly those with more experience, were more susceptible to depressive symptoms due to the cumulative effect of prolonged exposure to stress and crisis situations. Additionally, older workers may face additional vulnerabilities related to age, such as concerns about their own health or the health of those close to them, further contributing to their mental health challenges during the pandemic.

Conversely, anxiety was notably higher among younger participants with less work experience. This could reflect a lack of preparedness in coping with such a stressful and unprecedented crisis. Younger healthcare workers, being relatively new to the profession, may not have developed the same coping mechanisms and resilience as their more experienced colleagues. This finding aligns with other studies that have observed heightened anxiety levels in younger healthcare workers, particularly in the early stages of the pandemic when the full scale of the crisis became apparent. For example, a study conducted in the United States found that younger healthcare workers reported higher levels of anxiety and fear related to their inability to manage the novel challenges posed by COVID-19.

Despite the fact that workload and stress did not emerge as distinct statistical predictors of mental health, their universal presence among the study population highlights their central role in shaping healthcare workers' well-being during the pandemic. The fact that nearly all participants experienced increased workload and stress underscores the critical need for systemic solutions to reduce these pressures. Future research could focus on interventions aimed at reducing workplace stress, such as adjusting staffing levels, improving access to mental health resources, and fostering organizational support structures to better equip healthcare workers to handle future public health crises. Building psychological resilience, particularly among younger employees and those in high-risk roles (such as direct patient care), could serve as an important preventive strategy for mitigating the mental health impacts of future pandemics.

These findings are significant for informing the development of targeted support programs for healthcare workers. Such programs could include regular psychological support, stress management training, and the development of more effective coping strategies for healthcare workers, especially those on the frontlines of patient care. Given the prevalence of mental health issues among healthcare workers, interventions must be multifaceted and holistic, taking into account not just the clinical aspects of care, but

also the emotional and psychological needs of the workforce. The development and implementation of such programs could have a profound impact on improving mental health outcomes for healthcare workers and, in turn, enhancing their work efficiency, overall productivity, and satisfaction.

CONCLUSION

The results of this study indicate that healthcare workers in Serbia experienced significant stress, anxiety, and depression during the COVID-19 pandemic. Workload and stress were universally elevated, with direct patient contact and family members affected by COVID-19 being key factors contributing to increased stress levels. Depression was more prevalent in older and more experienced workers, likely due to the cumulative effect of chronic stress, while anxiety was more common in younger, less experienced healthcare workers. These findings underscore the importance of addressing workplace stressors and providing targeted mental health support for healthcare workers, particularly younger staff and those in direct patient contact. The development of effective interventions to mitigate stress and improve resilience will be crucial in supporting the mental well-being of healthcare workers in future public health emergencies.

REFERENCES

[1] Eurosurveillance Editorial Team. Note from the editors: World Health Organizations declares novel coronavirus (2019-nCoV) sixth public health emergency of international concern. Euro Surveill 2020; 25(5):200131e.

[2] Mahase E. China coronavirus: WHO declares international emergency as death toll exceeds 200. BMJ 2020; 368: m408.

[3] Centers for Disease Control and Prevention. SARS-CoV-2 Varinats Classifications and Definitions. 2023. Посећено: 01.12.2023. Дступно на: https://www.cdc.gov/coronavirus/2019-ncov/variants/variant-classifications.html>

[4] Azkur AK, Akdis M, Azkur D, Sokolowska M, van de Veen W, Brüggen MC, et al.Immune response to SARS-CoV-2 and mechanisms of immunopathological changes in COVID-19. Allergy. 2020; 75(7):1564-158.

[5] Институт за јавно здравље Србије „Др Милан Јовановић Батут“. Доступно на: https://www.batut.org.rs/download/aktuelno/110821.pdf, Институт за јавно здравље Србије „Др Милан Јовановић Батут“. Доступно на: https://www.batut.org.rs/download/aktuelno/110821.pdf https://www.paragraf.rs/propisi/uredba_o_planu_mreze_zdravstvenih_ustanova.html

[6] Tržan, M. S. Jerko: Psihološke posledice pandemije Covid-19 na zdravstvene delavce, Rehabilitacion, 2021.

[7] Lazarević M. Anksioznost kod zfravstvenih radnika u vreme pandemije COVID-19. Medicinski časopis. 2020;54(1):14-27.

[8] Bell V. , Wade D. Mental health of clinical staff working in high-risk epidemic and pandemic health emergencies a rapid review of the evidence and living meta-analytics. Social Psychiatry and Psychiatric Epidemiology. 2021;56(1).

[9] Clark DA, Beck AT. Cognitive theory and therapy of anxiety and depression. In: Ken-dall PC, Watson D, editors. Anxiety and de-pression: Distinctive and overlapping fea-tures. San Diego: Academic Press. 1989;379-411.

[10] Amat S, Subhan M, Jaafar W.M.W, Mahmud Z.I, Johari K.S.K. Evalution and psychometric status of the Brief Resilience Scale in a sample of Malaysian international students. Asian Social Science. 2014; 10(18):240-245.

[11] Адорић Ћубела В. Збирка психологијских скала и упитника. Свеучилиште у Задру, 2006.

[12] Beck AT, Steer RA, Carbin MG. Psychometric properties of the Beck Depression Inventory: Twenty-five years of evulation. Clinical psychology review.1988: 8(1);77-100.

[13]Zung WK William. „A Rating Instrument For Anxiety Disorders“ Psychosomatics. 1971; 12(6):371-379.

[14]Zheng J, Miao J, Guo R, Guo J, Fan Z, Kong X, et al. Mechanism of COVID-19 Causing ARDS: Exploring the Possibility of Preventing and Treating SARS-CoV-2.Front Cell Infect Microbiol. 2022; 12:931061.

[15]Sharma A, Ahmad Farouk I, Lal SK. COVID-19: A Review on the Novel Coronavirus Disease Evolution, Transmission, Detection, Control and Prevention.Viruses. 2021; 13(2).

[16]Popkin BM, Du S, Green WD, Beck MA, Algaith T, Herbst CH, et al. Individuals with obesity and COVID-19: A global perspective on the epidemiology and biological relationships. Obes Rev. 2020; 21(11):e13128.83.

[17]Pranata R, Lim MA, Yonas E, Vania R, Lukito AA, Siswanto BB, et al. Body mass index and outcome in patients with COVID-19: A dose-response meta-analysis.Diabetes Metab. 2021; 47(2):101178.84.

[18]Chu Y, Yang J, Shi J, Zhang P, Wang X. Obesity is associated with increased severity of disease in COVID-19 pneumonia: a systematic review and meta-analysis. Eur JMed Res. 2020; 25(1):64.Tseng L, Hittesdorf E, Berman MF, Jordan DA, Yoh N, Elisman K, et al.Predicting Poor Outcome of COVID-19 Patients on the Day of Admission with the COVID-19 Score. Crit Care Res Pract. 2021; 2021:5585291.

[19]Coopersmith CM, Antonelli M, Bauer SR, Deutschman CS, Evans LE, Ferrer R, et al.The Surviving Sepsis Campaign: Research Priorities for Coronavirus Disease 2019 in Critical Illness. Crit Care Med. 2021; 49(4):598-622.

[20]Mehta OP, Bhandari P, Raut A, Kacimi SEO, Huy NT. Coronavirus Disease (COVID-19): Comprehensive Review of Clinical Presentation. Front Public Health.2021; 8:582932.

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