Original article

doi:10.5633/amm.2025.0410

Prevalence of burnout and fatigue among healthcare workers of a secondary healthcare institution in Belgrade during the SARS-CoV-2 pandemic

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Burnout is increasingly being recognized globally as a major concern, affecting physical and mental well-being of HCWs (7). Material and methods: A cross-sectional study was conducted among the healthcare workers in Special hospital for rehabilitation and orthopedic prosthetics, using the following questionnaires: Maslach Burnout Invetory–Human Services Survey (MBI–HSS) for measuring three aspects of the burnout syndrome (EE, DP, and PA); Fatigue Severity Scale (FSS) for assess the presence and degree of fatigue and sociodemographic characteristics of respondents were collected through a general questionnaire. Only completely completed questionnaires were included in the study, and that number was 65. Results: majority of participants were: females (73,8%), married (61,5%), with university degree (52,3%), homeowners (66,2%) and with earnings above the minimum (81,5%). One third of study participants experienced the death of a close person due to COVID-19. High level of emotional exhaustion was observed in 41,5% of employees. Moderate to high level of depersonalization in 36,9% and 40% of them exhibited low level of personal accomplishment. EE was positively correlated with FSS. Depersonalization showed a statistically significant positive correlation with the Fatigue Severity Scale. That length of vacation as a one of demographic characteristic was also positively correlated with

the FSS. We found two factors associated with high levels of EE at healthcare workers and this are higher fatigue and lower monthly earnings.

Key words: Burnout syndrome, COVID-19, healthcare workers, fatigue

Originalni rad

doi:10.5633/amm.2025.0410

Prevalencija sindroma sagorevanja i umora među zdravstvenim radnicima sekundarne zdravstvene ustanove Beograd tokom pandemije SARS-CoV-2 virusa

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Izgaranje se sve više prepoznaje na globalnom nivou kao glavna briga, koja utiče na fizičko I mentalno blagostanje ZR (7). Materijal i Metod: sprovedena je studija preseka među zaposlenima zdravstvene službe Specijalne bolnice za rehabilitaciju I ortopedsku protetiku, primenom sledećih upitnika: Maslach Burnout Invetory–Human Services Survey (MBI–HSS) za merenje tri aspekta sindroma sagorevanja na poslu (EE, DP i OP); Fatigue Severity Scale (FSS) za procenu prisustva i stepena zamora i opšti upitnik kojim su prikupljeni sociodemografski parametri ispitanika. U studiju su uvršteni samo kompletno popunjeni upitnici i taj broj je bio 65. Rezultati: većina učesnika su bile: žene (73,8%), udate (61,5%), sa fakultetskom diplomom (52,3%), vlasnici kuće (66,2%) i sa zaradom iznad minimalca (81,5%). Trećina učesnika studije doživela je smrt bliske osobe zbog COVID-19. Visok stepen emocionalne iscrpljenosti primećen je kod 41,5% zaposlenih. Umeren do visok stepen depersonalizacije kod 36,9% i 40% njih ispoljilo je nizak nivo ličnog postignuća. EE je bio u pozitivnoj korelaciji sa FSS. Depersonalizacija je pokazala statistički značajnu pozitivnu korelaciju sa skalom ozbiljnosti umora. Dužina godišnjeg odmora

kao demografska karakteristika je takođe bila u pozitivnoj korelaciji sa FSS. Pronašli smo dva faktora povezana sa visokim nivoom EE kod zdravstvenih radnika, a to su veći umor i niže mesečne zarade.

Ključnereči: Sindrom sagorevanja, COVID-19, zdravstveni radnici, zamor

Introduction

The mental health impact of major disasters has a wider and longer impact on people than physical injuries (1). Numerous studies have explored the effect of an infectious disease outbreak on healthcare workers' mental health (2-6). This fact has been proven in studies conducted in the past two decades at the time of viral outbreaks such as SARS, MERS, Ebola (7-10). According to World Health Organization (WHO), HCWs are at high risk of physical and mental problems due to their contact with COVID-19 patients (11). Burnout syndrome (BOS) is a psychological syndrome characterized by factors such as emotional exhaustion (EE), mental fatigue, depersonalization (DP) or cynicism in the form of negative feelings and perceptions about the people one works with, and low personal accomplishment (LPA) (12). It develops in 20%-80% of HCWs (13). In the 11th version of the International Classification of Diseases (ICD-11), the World Health Organization (WHO) included BOS as "a syndrome resulting from chronic workplace stress that has not been successfully managed" (12). Burnout has been associated with impaired job performance and poor health, including headaches, sleep disturbances, irritability, marital difficulties, fatigue, hypertension, anxiety, depression, and myocardial infarction and may contribute to alcoholism and drug addiction (14). According to recent studies, some HCWs have developed psychological distress, fatigue, and burnout while facing the COVID-19 (15, 16). Work-related stress among healthcare workers has become a significant health issue not only for employees but also for the entire economy. Undoubtedly, healthcare workers played a key role in fighting the consequences of the pandemic but, at the same time, their professional and private lives were strongly disrupted (17).

The aim of this study was to analyze the burnout syndrome and fatigue among healthcare workers of Special hospital for rehabilitation and orthopedic prosthetics Belgrade.

Material and Methods

We conducted a cross-sectional study in the period from January to February 2024, a population of respondents was represented by healthcare workers of the Special hospital for rehabilitation and orthopedic prosthetics Belgrade. The criteria for inclusion of respondents in the research were the following: adults (> 18 years), permanent employment in the mentioned sector and voluntary consent to participate in the study. Exclusion criteria: minors (< 18 years), discontinuity in work for more than a year, and persons who refused to participate. This study was approved by the Ethics Committee of the Special hospital for rehabilitation and orthopedic prosthetics in Belgrade, date 25.01.2024. The data for this study were obtained by voluntary filling of anonymous questionnaires by the respondents. The representative sample size was 79 out of which 65 participants filled out all questionnaires. https://www.checkmarket.com/sample-size-calculator. To this research, a general questionnaire was constructed and two more were used: BMI-HSS and FSS.

The general questionnaire contains 19 questions and was used to collect the basic sociodemographic data of the respondents (gender, age, marital status, education level, length of service, illness from COVID-19).

Maslach Burnout Inventory Human Services Survey (MBI-HSS) contains 22 questions with 3 subscales that measure level of EE, DP and PA. Respondents circling one of the provided answers on a seven-point Likert scale (0 – never; 1 – few times a year or less; 2 – once a month or less; 3 – several times a month; once a week; 5 – several times a week; 6 – every day). The borders values of EE: 0-16 low, 17-26 medium, 27≥ high; DP: 0-6 low, 7-12 medium, 13≥ high; PA: 0-31 low, 32-38 medium, 39≥ high.

The Krupp Fatigue Scale is a one-dimensional measuring instrument whose goal is to detect fatigue symptoms. This instrument belongs to self-ranking measures. The respondent ranks each statement on the scale according to the greatest similarity with personal feelings and perceptions. It consists of 9 statements that are scored on a seven-point Likert scale, from strong disagreement to complete agreement with the statement offered. The total score can have values from 9 to 63. The total value of FSS is further divided by 9 and thus the average fatigue score is obtained, which can have values from 1 (complete absence of fatigue) to 7 (the most pronounced presence of fatigue). Values of the average score higher than 4 were marked by the author as pathological. The average FSS score for people who only have depression is about 4,5. The score of people with fatigue due to chronic diseases is higher (around 6,5 on average).

Statistical analysis

The descriptive statistics, including means, medians, standard deviations, and percentiles for numerical variables and numbers and percentages for categorical variables, were used to characterize the study sample. Mann-Whitney U test was used for numerical data to evaluate differences between groups. Spearman's correlation coefficients were calculated to explore the relationship between MBI-HSS, Fatigue severity scale (FSS) and numerical demographic characteristics of the study population. According to Evans' classification (18), a correlation coefficient <0.20 was considered to represent a very week correlation, 0.20–0.39 week, 0.40–0.59 moderate, 0.60–0.79 strong, and >0.80 very strong correlation. Univariate and multivariate logistic regression analysis was used to determine independent predictors of burnout. MBI-HSS subscales were used as dependent variables in separate regression models. EE was categorized into low/medium vs high in regression model. Independent variables were the following: sex, age, marital status, level of education, length of service, profession, executive positions, socioeconomic status, Fatigue severity scale and COVID-related characteristics. Variables were included in the multivariate regression analysis if they were significant at the $p < 0.050$ level according to the results of the univariate analysis. For the implementation of multiple logistic regressions, model assumptions were taken into account. All tests were two-tailed. $P<0.05$ was considered statistically significant. Statistical analysis was done using IBM SPSS Statistics 25 software.

Results

A total of 65 employees fulfilled questionnaires and the response rate was 81,25%. There were more females (73.8%) with an average age of 45.4±12.5 years, with range from 22 to 64 years. The majority were: married (61.5%), with a university degree (52.3%), homeowners (66.2%), working in shifts (69.2%) and 81,5% of them earned above the minimum wage. The median years of service were 20, with a range from 7 to 30 years. Additionally, 24.6% of the participants held executive positions (Table 1).

Table 1. Demographic characteristics of the study population

Variable	n=65
Sex, n (%)	
Female	48 (73.8)
Male	17 (26.2)
Age, mean±sd	45.4±12.5
Marital status, n (%)	
Married	40 (61.5)
Single	13 (20.0)
Divorced	5 (7.7)
Children, n (%)	
None	22 (33.8)
One	14 (21.5)
More	29 (44.6)
Education level, n (%)	
Highschool	20 (30.8)
College	11 (16.9)
Faculty	34 (52.3)
Profession, n (%)	
Nurse	29 (44.6)
Physiotherapist	16 (24.6)
Medical doctor	5 (7.7)
Specialist	15 (23.1)
Years of service	20 (7-30)
Working in shifts, n (%)	45 (69.2)
Shift hours	8 (5.5-12)
Length of annual leave (days)	35 (30-35)
Executive position	16 (24.6)
Duration of executive position (years)	10 (7-20)
Housing, n (%)	
Home owner	43 (66.2)
Renting	5 (7.7)
Other	17 (26.2)
Monthly earnings, n (%)	
Lower than minimal	3 (4.6)
Around minimal	9 (13.8)
Above	53 (81.5)
Sleeping hours during 24h	6 (6-8)

Data are presented as median (25–75 percentiles)

A significant majority (80.0%) reported infection with COVID-19. A 75.4% of the participants were vaccinated and 64.6% experienced stressful event during COVID pandemic (Table 2).

Table 2. COVID-related characteristics of the study population

Variable	n (%)
COVID-19 infection	52 (80.0)
COVID-19 vaccine	49 (75.4)
Close person died because of COVID	21 (32.3)
Stressful event COVID	42 (64.6)

Table 3 presents the distribution of participants for all burnout levels alongside median scores with 25th and 75th percentile for each burnout domain. The EE domain had a median score of 20 (25th-75th percentile: 10.5-36), with 41.5% of participants classified under low burnout, 16.9% under moderate, and 41.5% under high burnout. For DP domain the median score was 3 (25th-75th percentile: 0-7.5), with most healthcare workers (63.1%) experiencing low burnout. PA domain scores had a median of 36, with low and high burnout levels closely distributed at 40% and 38.5%, respectively.

The correlation coefficients between FSS and the MBI-HSS domains are presented in Table 4. Emotional Exhaustion (EE) was positively correlated with the FSS, with a moderate effect size (ρ=0.570; p<0.001). Depersonalization (DP) also showed a statistically significant positive correlation with the Fatigue Severity Scale, indicated week effect size (ρ=0.320; p=0.009).

Table 3. Burnout syndrome among healthcare workers

Domain	median (25^{th}-75^{th} percentile)	Low burnout	Moderate burnout	High burnout
EE	20 (10.5-36)	27 (41.5%)	11 (16.9%)	27 (41.5%)
DP	3 (0-7.5)	41 (63.1%)	14 (21.5%)	10 (15.4%)
PA	36 (29.5-42.5)	26 (40%)	14 (21.5%)	25 (38.5%)

Notes: Cutoffs for low/moderate/high burnout are: EE: 0-6 low, 17-26 moderate, ≥27 high; DP: ≥13 high, 7-12 moderate, 0-6 low; PA: ≥39 low, 32-38 moderate, 0-31 high. The PA subscale is interpreted in the opposite direction as the EE and DP subscales

Table 4. Correlation coefficients between FSS and MBI-HSS domains

Burnout domain	Spearman's rho correlation coefficient	Effect
EE	0.570*	Moderate
DP	0.320*	Week
PA	-0,175	No correlation

*p<0.050

Table 5 presents the demographic characteristics of respondents and their associations with burnout levels and the FSS. Median scores for males were 20 for EE, 2 for DP, 35 for PA, and 2.6 for FSS, whereas females had median scores of 21 for EE, 3 for DP, 36 for PA, and 3.4 for FSS. Age correlation coefficients were 0.102 for EE, -0.071 for DP, and 0.099 for PA ($p>0.050$). Married participants had median scores of 22 for EE, 5 for DP, and 36 for PA, while single or separated participants showed scores of 20 for EE, 3 for DP, and 32 for PA. Participants with children reported median scores of 22 for EE, 3 for DP, and 36 for PA. Educationally, those with high school or college degrees had median scores of 20 for EE and 35 for PA, and faculty-educated participants had scores of 21.5 for EE and 36.5 for PA ($p>0.050$). Profession-wise, nurses and physiotherapists had a median EE score of 20, while medical doctors and specialists had a higher median EE score of 26 ($p>0.050$). Length of vacation was positively correlated with the FSS, with weak effect size ($\rho=0.267$; $p=0.033$). Individuals with lower monthly earnings had significantly higher median EE scores of 36 (25th-75th percentile 27-44) than participants with higher monthly earnings (median 20, 25th-75th percentile 10-29) ($p=0.006$).

Univariate and multivariate logistic regression analysis was conducted to identify factors associated with burnout. The findings are presented in Table 6. For the EE domain, two variables were identified as significant predictors in univariate logistic regression model: monthly earnings ($p=0.015$) and fatigue severity scale ($p=0.001$). Healthcare workers with higher fatigue and lower monthly earnings are more likely to experience high levels of emotional exhaustion. In multivariate logistic regression analysis fatigue severity scale was significantly associated with emotional exhaustion ($p=0.002$).

Table 5. Demographic characteristics of the study population according to burnout domains and FSS

Variable	EE	DP	PA	FSS
Sex				
Male	20 (11-27)	2 (0-5)	35 (28-42)	2.6 (2-3.6)
Female	21 (11-39)	3 (1-8)	36 (30-43)	3.4 (2.2-4.9)
Age$^{\rho}$	0.102	-0.071	0.099	0.129
Marital status				
Married	22 (13-36)	5 (2-8)	36 (31-44)	3.6 (2.5-4.8)
Single/ Separated	20 (10-31)	3 (0-8)	32 (28-40)	2.6 (2.1-4.2)
Children, Yes	22 (11-36)	3 (0-6)	36 (28-44)	3.5 (2-5.1)
Education level				
Highschool/ College	20 (10-35)	5 (1-8)	35 (28-42)	3.6 (2.1-5.3)
Faculty	21.5 (10.8-36.5)	2.5 (0-7.3)	36.5 (29.8-43)	3.1 (2-4.3)
Profession				
Nurse/ Physiotherapist	20 (10-31)	3 (0-6)	36 (29-43)	3.2 (2.1-4.5)
Medical doctor/ Specialist	26 (18-39)	3 (0-8)	36 (30-42)	3.2 (2.1-4.3)
Years of service$^{\rho}$	-0.006	-0.054	0.108	0.119
Working in shifts	22 (14-32)	2 (0-7)	35 (30-41)	3.2 (2.1-4.2)
Shift hours$^{\rho}$	0.041	0.058	0.185	-0.036
Length of vacation per year$^{\rho}$	0.165	-0.132	0.036	0.267*
Executive position	29 (20-39)	4 (0-7)	35 (31-44)	3.1 (1.9-4.1)
Duration of executive position (years) $^{\rho}$	0.037	-0.073	-0.434	-0.25
Housing, n (%)				
Home owner	23 (11-38)	3 (0-7)	36 (28-44)	3.2 (2-4.5)
Renting/ Other	20 (10-27)	5 (0-8)	35 (30-40)	3.2 (2.3-4.4)
Monthly earnings				
Lower than minimal/ Around minimal	36 (27-44)*	6 (1-10)	32 (26-36)	4 (2.7-7)
Above	20 (10-29)	3 (0-6)	38 (30-43)	3 (2-4.3)
Number of sleeping hours during 24h$^{\rho}$	-0.245	-0.129	0.01	-0.011
COVID-19 infection	21 (11-36)	3 (1-7)	36 (31-43)	3.2 (2.1-4.5)
COVID-19 vaccine	22 (13-36)	3 (0-6)	36 (30-43)	3.2 (2.2-4.5)
Close person died because of COVID	23 (16-36)	3 (0-6)	37 (30-44)	3.6 (2.8-5)
Stressful event COVID	20 (10-31)	4 (1-8)	35 (30-42)	2.9 (2-4.3)

Data are presented as median (25–75 percentiles); $^{\rho}$Correlation coefficient (rho); *p<0.050

Table 6. Univariate and multivariate logistic regression model with EE burnout as dependent variable

Variables	Univariate			Multivariate		
	B	95% CI	p	B	95% CI	p
EE						
Monthly earnings	0,171	0.04-0.71	0,015	0,221	0.05-1.06	0,06
FSS	1,852	1.30-2.65	0,001	1,803	1.24-2.62	0,002

Discussion

In our study most of respondents were: females (73,8%), married (61,5%), with university degree (52,3%), homeowners (66,2%), working in shifts (69,2%), with earnings above the minimum (81,5%) and 64,6% experienced stressful event during COVID pandemic, similar to observational study conduct in Verona hospital on HCWs in which 61,3% participants reported that they had COVID-related stressful event (19). Cross-sectional study done 2021 on Turkey healthcare workers shows that 56,7% have moderate to high EE, 35,8% moderate to high DP and 58% low PA. While in our study population 58,4% have moderate to high EE, 36,9% moderate to high DP and 40% low PA. Almost a third of HCWs on north-west Italy had high EE, DP and low PA (6). A statistically significant positive correlation was found between Fatigue Severity Scale and emotional exhaustion, also depersonalization showed a statistically significant positive correlation with the FSS. Regarding association between demographic characteristics and FSS, we found that length of vacation was positively correlated with fatigue. Many studies have been done about burnout syndrome and factors associated with it (1,6,16,19) and in each of them different predictors influenced on high values of burnout. For EE domain we identified two significant predictors: monthly earning and Fatigue Severity Scale. Healthcare workers with higher fatigue and lower monthly earnings are more likely to experience high levels of emotional exhaustion.

Conclusion

Results of our study as many others about burnout syndrome at healthcare workers, both during COVID as during previous (SARS, MERS) pandemics have shown that mental health employees in this sector is jeopardize. Knowing the fact what kind damage can burnout done and that man is the most important resource in implementation of health care, we are of the opinion that is necessary to create and implement a program of preventive mental health care for HCWs.

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