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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 has been recognized increasingly globally as a major concern, affecting the physical and mental well-being of Healthcare Workers (HCWs). A cross-sectional study was conducted among the healthcare workers in Special Hospital for Rehabilitation and Orthopedic Prosthetics using the following questionnaires: Maslach Burnout Inventory–Human Services Survey (MBI–HSS) for measuring the three aspects of burnout syndrome: emotional exhaustion (EE), depersonalization (DP), and personal accomplishment (PA); Fatigue Severity Scale (FSS) for assessing the presence and degree of fatigue, and sociodemographic characteristics of respondents collected through a general questionnaire. Only fully completed questionnaires, 65 of the total of 79, were included in the study. The majority of participants were females (73.8%), married (61.5%), university degree holders (52.3%), homeowners (66.2%), and those earning above the minimum (81.5%). One third of study participants experienced the death of a close person due to coronavirus disease 2019 (COVID-19). High level of EE was observed in 41.5% of employees. Moderate to high level of DP was recorded in 36.9% of participants, and 40% exhibited a low level of PA. Emotional exhaustion was positively correlated with the FSS. Depersonalization showed a statistically significant positive correlation with the FSS. The length of vacation as the demographic characteristic was also positively correlated with the FSS. Two factors were found to be associated with high levels of EE among HCWs, and those were higher fatigue and lower monthly earnings.

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Key words: *burnout syndrome, coronavirus disease 2019, healthcare workers, fatigue*

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Introduction

The mental health effects of major disasters impact people more profoundly and for longer duration 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 during viral outbreaks such as severe acute respiratory syndrome (SARS), Middle East respiratory syndrome (MERS), and Ebola (7–10). According to the World Health Organization (WHO), healthcare workers (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 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 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, HCWs 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).

This study aimed to analyze burnout syndrome and fatigue among HCWs in the Special Hospital for Rehabilitation and Orthopedic Prosthetics in Belgrade.

Materials and Methods

A cross-sectional study, conducted from January to February 2024, included the population of respondents represented by HCWs of the Special Hospital for Rehabilitation and Orthopedic Prosthetics in Belgrade. The criteria applied to the research participants included adults (> 18 years), individuals permanently employed in the mentioned sector, and those who voluntarily consented to participate in the study. Exclusion criteria were applied to minors (< 18 years), those who had 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 on January 25, 2024. The data for this study were obtained by voluntary filling of anonymous questionnaires by the respondents. The representative sample size was 79, of which 65 participants filled out all questionnaires. For this research, a general questionnaire was constructed and used along with Maslach Burnout Inventory–Human Services Survey (MBI–HSS) and Fatigue severity scale (FSS). The general questionnaire contained 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 the level of emotional exhaustion (EE), depersonalization (DP) and personal accomplishment (PA). Respondents circled 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;4—once a week; 5—several times a week; 6—every day). The border values for EE: low level (0–16), medium level (17–26), high level (≥ 27); DP: low (0–6), medium (7–12), high (≥ 13); PA: low (0–31), medium (32–38), high (≥ 39).

The Krupp Fatigue Scale is a one-dimensional measuring instrument intended to detect fatigue symptoms. It falls under the category of self-ranking measures, meaning that respondents rank each statement on the scale according to the greatest similarity with their personal feelings and perceptions. The scale consists of nine statements that are scored on a seven-point Likert scale, from strong disagreement to streng 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, thus obtaining the average fatigue score, 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 individuals with only depression was about 4.5. The score for people with fatigue due to chronic diseases was 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. The 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 Maslach Burnout Inventory–Human Services Survey (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 a very weak correlation, 0.20–0.39 weak, 0.40–0.59 moderate, 0.60–0.79 strong, and > 0.80 very strong correlation. Univariate and multivariate logistic regression analysis were used to determine independent predictors of burnout. MBI–HSS subscales were used as dependent variables in separate regression models. emotional exhaustion was categorized into low/medium vs. high in the regression model. Independent variables were the following: sex, age, marital status, level of education, length of service, profession, executive positions, socioeconomic status, FSS and COVID-19-related characteristics. Variables were included in the multivariate regression analysis if they were significant at the $p < 0.05$ 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 version 25.

Results

A total of 65 employees filled questionnaires, and the response rate was 81.25%. There were more females (73.8%) with an average age of 45.4 ± 12.5 years, within a range from 22 to 64 years. The majority of female participants were married (61.5%), with a university degree (52.3%), homeowners (66.2%), those working in shifts (69.2%), and 81.5% of them earned above the minimum wage. The median years of service were 20, within a range from 7 to 30 years. Additionally, 24.6% of the participants held executive positions (Table 1).

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

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 24 h	6 (6–8)

Data are presented as median (25–75 percentiles)

Table 2. COVID-19-related characteristics of the study population

Variable	n (%)
COVID-19 infection	52 (80.0)
COVID-19 vaccine	49 (75.4)
Loss of close person due to COVID-19	21 (32.3)
COVID-19 as a stressful event	42 (64.6)

Table 3 presents the distribution of participants for all burnout levels alongside median scores with 25th and 75th percentiles 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 as low burnout, 16.9% under moderate, and 41.5% under high burnout. For the DP domain, the median score was 3 (25th–75th percentile: 0–7.5), with most HCWs (63.1%) experiencing low burnout. personal accomplishment domain scores had a median of 36, with low and high burnout levels closely distributed in 40% and 38.5%, respectively.

The correlation coefficients between FSS and the MBI–HSS domains are presented in Table 4. Emotional exhaustion was positively correlated with the FSS, with a moderate effect size (ρ = 0.570; $p < 0.001$). Depersonalization also showed a statistically significant positive correlation with the FSS, indicated weak effect size (ρ = 0.320; p = 0.009).

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 ($p > 0.05$). 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 university-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 ($p > 0.050$). The length of vacation was positively correlated with the FSS, with a weak effect size (ρ = 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 analyses were 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 the univariate logistic regression model: monthly earnings (p = 0.015) and FSS (p = 0.001). Healthcare workers with higher fatigue and lower monthly earnings were more likely to experience high levels of EE. In multivariate logistic regression analysis, FSS was significantly associated with EE (p = 0.002).

Table 3. Burnout syndrome among healthcare workers

Domain	Median (25th–75th 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: low (0–6), moderate (17–26), high (≥ 27); DP: high (≥ 13), moderate (7–12), low (0–6); PA: low (≥ 39), moderate (32–38), high (0–31). 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 Ro correlation coefficient	Effect
EE	0.570*	Moderate
DP	0.320*	Week
PA	-0.175	No correlation

*p < 0.050

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	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				
High school/College	20 (10–35)	5 (1–8)	35 (28–42)	3.6 (2.1–5.3)
University	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	-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	0.041	0.058	0.185	-0.036
Length of vacation per year	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)	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	-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)
Loss of a close person due to COVID-19	23 (16–36)	3 (0–6)	37 (30–44)	3.6 (2.8–5)
COVID-19 as a stressful event	20 (10–31)	4 (1–8)	35 (30–42)	2.9 (2–4.3)

Data are presented as median (25–75 percentiles); ρCorrelation coefficient (rho); *p < 0.050

Table 6. Univariate and multivariate logistic regression models with EE burnout as the 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 the present study, most respondents were females (73.8%), married (61.5%), holding university degrees (52.3%), homeowners (66.2%), working in shifts (69.2%), earning above the minimum (81.5%), and 64.6% experienced stressful event during the COVID-19 pandemic, similar to the observational study conducted in Verona hospital on HCWs in which 61.3% of participants reported that they had experienced COVID-19-related stressful event (19). A cross-sectional study conducted among Turkish HCWs in 2021 showed that 56.7% have moderate to high EE, 35.8% moderate-to-high DP and, 58% low PA. While in the current study population, 58.4% have moderate to high EE, 36.9% moderate to high DP, and 40% low PA. Almost a third of HCWs in North-West Italy had high EE, DP, and low PA (6). A statistically significant positive correlation was found between the Fatigue Severity Scale and emotional exhaustion; also, depersonalization showed a statistically significant positive correlation with the FSS. Regarding the association between demographic characteristics and FSS, it was found that the length of vacation was positively correlated with fatigue. Many studies have been conducted on burnout syndrome and its associated factors (1, 6, 16, 19), and each of them identified different predictors associated with higher burnout scores. For the EE domain, two significant predictors were identified: monthly earnings and FSS. Healthcare workers with higher fatigue and lower monthly earnings were more likely to experience high levels of emotional exhaustion.

Conclusion

Results of the present study, along with many others concerning burnout syndrome among healthcare workers during COVID-19 pandemic as well as previous pandemics like SARS and MERS, have demonstrated that the mental health of employees in this sector is at risk. Recognizing the potential damage caused by burnout and understanding that humans are the most valuable resource in healthcare delivery, we strongly believe that it is essential to develop and implement a program of preventive mental health care for healthcare workers.

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PREVALENCIJA SINDROMA SAGOREVANJA I UMORA MEĐU ZDRAVSTVENIM RADNICIMA U JEDNOJ SEKUNDARNOJ ZDRAVSTVENOJ USTANOVI U BEOGRADU U TOKU PANDEMIJE SARS-CoV-2 VIRUSA

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Izgaranje se na globalnom nivou sve više prepoznaje kao glavna briga, budući da utiče na fizičko i mentalno blagostanje zdravstvenih radnika. Sprovedena je studija preseka među zaposlenima u zdravstvenoj službi Specijalne bolnice za rehabilitaciju i ortopedsku protetiku. Korišćeni su sledeći upitnici: *Maslach Burnout Invetory–Human Services Survey* (MBI–HSS) – za merenje triju aspekata sindroma sagorevanja na poslu: emotivne iscrpljenost (engl. *emotional exhaustion* – EE) depersonalizacije (enl. *depersonalization* – DP) lična postignuća (engl. *personal accomplishment* – PA) *Fatigue Severity Scale* (FSS) – za procenu prisustva i stepena zamora; opšti upitnik, kojim su prikupljeni sociodemografski parametri ispitanika. U studiju su uvršteni samo kompletno popunjeni upitnici; takvih je bilo šezdeset pet. Dobijeni rezultati su pokazali da je većina učesnika bila ženskog pola (73,8%); udate (61,5%), sa fakultetskom diplomom (52,3%), vlasnice kuća (66,2%) i sa zaradom koja prevazilazi minimalnu zaradu (81,5%). Trećina učesnika u studiji doživela je smrt bliske osobe usled kovida 19. Visok stepen emocionalne iscrpljenosti primećen je kod 41,5% zaposlenih. Umeren do visok stepen depersonalizacije zabeležen je kod 36,9% zaposlenih, dok je 40% njih ispoljilo nizak nivo ličnog postignuća. U pozitivnoj korelaciji sa FSS-om bio je EE. Depersonalizacija je pokazala statistički značajnu pozitivnu korelaciju sa FSS-om ozbiljnosti umora. Dužina godišnjeg odmora kao demografska karakteristika takođe je bila u pozitivnoj korelaciji sa FSS-om. Uočena su dva faktora povezana sa visokim nivoom EE-ja kod zdravstvenih radnika: viši stepen umora i niže mesečne zarade.

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