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Burnout rate among healthcare workers during COVID19 pandemic in Medina, Saudi Arabia

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ABSTRACT

Background and Aims: Globally, burnout is considered a major problem, disturbing the mental and physical well-being of healthcare workers, and potentially affecting the quality of the care provided. This research was conducted to evaluate the rate of burnout and related risk factors during the coronavirus disease 2019 (COVID-19) pandemic. *Methodology:* A cross-sectional study was conducted between March 2021 and October 2021 to evaluate the rate of burnout among healthcare workers who were in contact with COVID-19 patients at different healthcare facilities in Medina. A semi-self-structured questionnaire, including the Maslach Burnout Inventory for Medical Personnel, was conducted through social media networks. *Results:* A total of 239 participants met the inclusion criteria. Their mean age was 35.4 years and almost half were female. The health and well-being scores were mean=0.77 and standard deviation=0.33. In addition, the mean emotional exhaustion score point was high (28), and the depersonalization and personal accomplishment were moderate (8.8 and 34.6, respectively). Collectively, the overall score was 71.5, indicating high burnout. Participants with chronic stress as well as younger age groups less than 33 years showed significantly higher scores. Furthermore, participants with impaired quality of sleep had a significantly higher incidence of burnout. Finally, regression analysis showed a significant inverse relationship between burnout and health and well-being. *Conclusion:* High percentage of the participants (82%) experienced high burnout during the COVID-19 pandemic. Being younger, having chronic stresses, and having impaired sleep quality were observed to be connected to high burnout.

Keywords: coronavirus disease 2019, Medina, burnout, healthcare workers, Maslach

1. INTRODUCTION

Burnout is negatively affecting the mental and physical well-being of healthcare workers (HCWs), and currently a serious issue disturbing the quality of healthcare systems all over the world. The International

Classification of Diseases (ICD)-11 recognizes burnout as an occupational phenomenon rather than a medical condition. It is defined as a syndrome originating from prolonged workplace pressure that has not been properly managed. It has three dimensions: depersonalization (DP), which is an increased mental distance from one's work; emotional exhaustion (EE), including feelings of energy depletion; and a diminished perception of self-accomplishment (PA) (International Classification of Diseases, 2019).

The severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) that first appeared in late December 2019 in Wuhan, China, frequently presents as a severe acute respiratory condition described as coronavirus disease 2019 (COVID-19) (Zhou et al., 2020). In March 2020, the earliest case of COVID-19 was confirmed in Saudi Arabia in Al-Qatif, Eastern province (Ministry of Health, COVID 19 Dashboard: Saudi Arabia, 2021). COVID-19 pandemic has resulted in a surge in the frequency of mental conditions as well as exacerbated pre-existing conditions among HCWs (Lai et al., 2020).

HCWs have been reported to experience psychological effects during previous outbreaks, such as Ebola and SARS-CoV-1 (Kisely et al., 2020). One of the main contributing factors to burnout among HCWs is the occupational hazards because of the extremely contagious nature of SARS-CoV-2 (Adams & Walls, 2020), along with the limited availability of personal protection equipment (Sasangohar et al., 2020). Burnout has also been attributed to lack of definitive COVID-19 treatments, personal isolation; sleep disturbance, difficult emotional and ethical decisions such as resource allocation and withholding resuscitation (Mehta et al., 2021). Burnout has a negative impact on HCWs' mental health, leading to mood disorders (Bianchi et al., 2015), substance abuse (Oreskovich, 2012), and suicidal ideation (Schernhammer & Colditz, 2004), all of which lead to suboptimal patient care (Shanafelt et al., 2003), and higher healthcare costs (Moss et al., 2016).

A cross-sectional study in Japan looked at the prevalence of burnout among HCWs during the pandemic and found that 31.4% of 312 HCWs suffered from burnout. Furthermore, similar research in Saudi Arabia revealed that 75% of the 646 HCWs had also suffered from burnout (Alsulimani et al., 2021). Both the physical and mental well-being of HCWs is significantly impacted by burnout, which could affect the quality of standard care. To the best of the researchers' knowledge, there are little studies evaluating the burnout rate among HCWs during the COVID-19 pandemic in Medina, Saudi Arabia.

Hence, this research was conducted using the MBI – Human Services Survey for Medical Personnel (MBI-HSS MP) to evaluate the rate of burnout and related risk factors.

2. METHODOLOGY

A descriptive analytic cross-sectional study was done between March 2021 and October 2021 to evaluate the rate of burnout among HCWs who were in direct contact with COVID-19 patients or their samples at different healthcare facilities in Medina, Saudi Arabia. The study protocol and instrument were revised by the Medical Research Ethics Committee, College of Medicine, Taibah University. Ethical approval was obtained on 15 December 2020 (study ID: STU-20-003). The study used a convenience sampling method for recruitment. All HCWs who completed the questionnaire and met the inclusion criteria were included in the sample, which included all HCWs who had direct contact with COVID-19 patients or their samples working in Medina healthcare centers at any time during the pandemic. The exclusion criteria were those with indirect contact with COVID-19 patients or their samples and those with a history of psychiatric disorder.

Social media networks were used to invite the participants. Participation was optional and anonymous, and it was accomplished by the completion of a questionnaire. The invitation message included an explanation of the study's purpose, the primary investigator's contact information, and a live link to the survey. The tool used to obtain data was a semi-self-structured questionnaire written in both Arabic and English that took between 8 and 10 minutes to complete. The questionnaire was comprised of three sections: The first section was for obtaining informed consent and ensuring participants met the inclusion criteria. The questionnaire would proceed on to the following part if they agreed; otherwise, it would finish. The second section was for gathering socio-demographic data and ensuring all personal information was kept confidential. Respondents were enquired to declare their age, gender, job title, workplace, physicians' specialty, years of experience, smoking status, alcohol or illicit drug use during the pandemic, sleep quality, suffering from chronic stress, and if the respondent had a positive COVID-19 swab. The last section comprised a translated version of the MBI-HSS MP.

The MBI-HSS MP is an internationally renowned, validated, and self-reported questionnaire for measuring the severity of workplace burnout using the three measurements of EE (9 items), DP (5 items), and PA (8 items). The questionnaire was reprinted with permission from (MBI: HSS MP, 1981). It consists of 22 questions, where the items are answered by assessing the frequency of experiencing these feelings and plot it on a seven-point Likert scale where values ranged from 0 (never) to 6 (every day) (Alanazi et al., 2020). This tool has been used extensively in many studies worldwide (MBI: HSS MP, 1981). Responses were later subgrouped

based on their scores in each dimension as high EE: 27 or over; moderate EE: 19–26; low EE: 0–18; high DP: 10 or over; moderate DP: 6–9; low DP: 0–5; high PA: 0–33; moderate PA: 34–39; and low PA: 40 or over (PA in the opposite direction from EE and DP).

The level of burnout is indicated by scores on each of the three MBI subscales. The minimum and maximum scores for EE, DP and PA ranges from 0 - 54, 0 - 30 and 0 - 48 respectively. A high level of burnout was defined as the presence of one or more of the following (MBI: HSS MP, 1981). The high-burnout group consisted of all individuals who met one or more of the predetermined requirements. The rest were included in the low–moderate-burnout group.

1. High score in EE (equal or more than 27)
2. High score in DP (equal or more than13)
3. Low score in PA (equal or less than 31).

Descriptive analyses were utilized to study the participant's characteristics and the dependent variables. The participants were placed into groups based on their gender, job title (physicians or non-physicians), and specialty (medical, surgical, non-physician, and others). They were also grouped by the healthcare facilities where they worked (general hospitals, special hospitals, primary healthcare centers, and others). The variables were presented using means, frequencies, and percentages. Correlation between the MBI-HSS MP subscales was used to inspect the risk variables related to the development of burnout.

Statistical analysis

Statistical Package for Social Sciences version 26.0 was used to conduct the statistical analysis. All the data acquired through questionnaires was initially coded into variables. The Kolmogorov-Smirnov test was used to establish whether the data were normally distributed. Results were presented using both descriptive and inferential statistics, including the Chi-square test, Mann-Whitney U test, Kruskal-Wallis H test, and linear and logistic regression (Morgantini et al., 2020). The tests were conducted depending on the characteristics of the data, and each test was determined statistically significant if the p-value was less than 0.05.

3. RESULTS

Reliability of the survey

The reliability of the survey was verified by calculating internal consistency coefficients (Cronbach alpha). Reliability coefficients for the individual domains were calculated. The dimensions of the survey ranged between 0.88 for the EE dimension and 0.70 for the DP dimension. These values are adequate to achieve the objectives of the study.

Participants' demographic data

Three hundred and thirty-eight HCWs responded to the survey. However, only 239 responders were eligible for inclusion. Out of 239 participants, 53.1% were male. Age, job title, workplace, specialty, and years in practice were subgrouped into four groups, where the minimum age was 23 and the highest age was 65. Additionally, 28.5% of the participants were between the ages of 23 and 28 years old, with a mean age of 35.4±13.8. And 56.1% of the respondents are physicians. Finally, 65.3% of the participants work in general hospitals.

Participants' health and well-being level

The participants were asked about having a previous COVID-19 infection as well as other health conditions. 25.1% had a previous COVID-19 infection, 31.8% had chronic stress, 56.5% had their quality of sleep affected during the pandemic, 19.7% were smokers, and only one participant consumed alcohol during the pandemic. Additionally, 1.7% used illicit drugs during the pandemic.

Responses to the Maslach Burnout Inventory

The HCWs were asked a group of questions to evaluate their EE, DP, and PA by choosing answers from a Likert scale, starting from zero ('never') to 6 ('every day'). For each item, descriptive statistics in the survey are presented in Figures 1, 2, and 3.

Emotional exhaustion

Figure 1 shows the responses for the EE dimension. The average response of the participants to the EE dimension items is 3.1 out of 6, which indicates a medium score of EE.

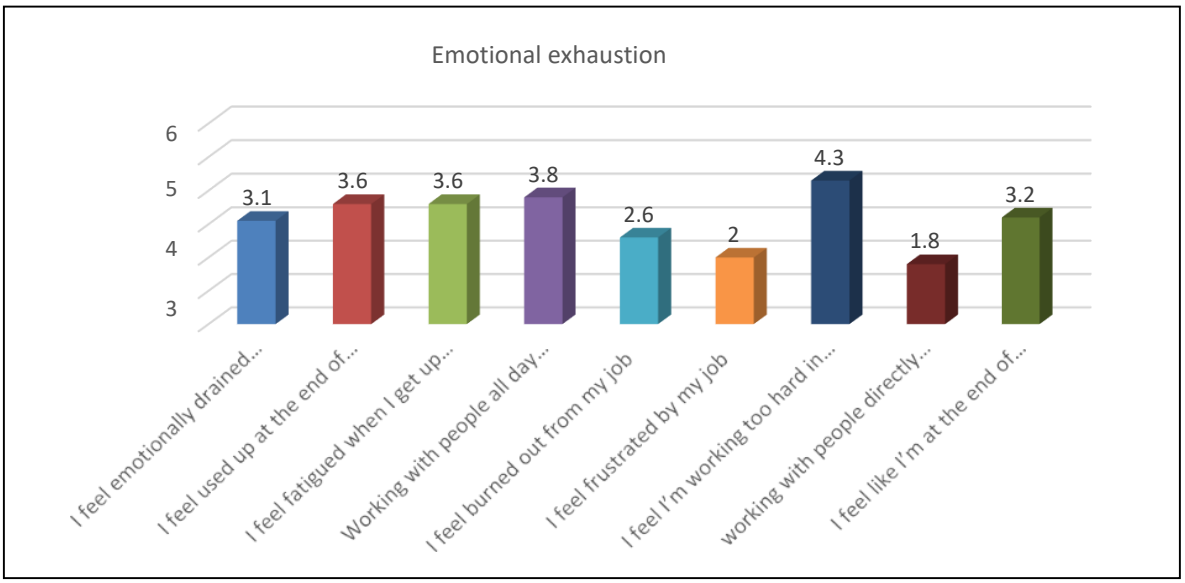

Figure 1 The average degree of response of the study sample to the EE dimension

Depersonalization

Figure 2 shows the responses for the DP dimension. The average response of the participants to the DP dimension items is 1.8 out of 6, which indicates a lower score of DP.

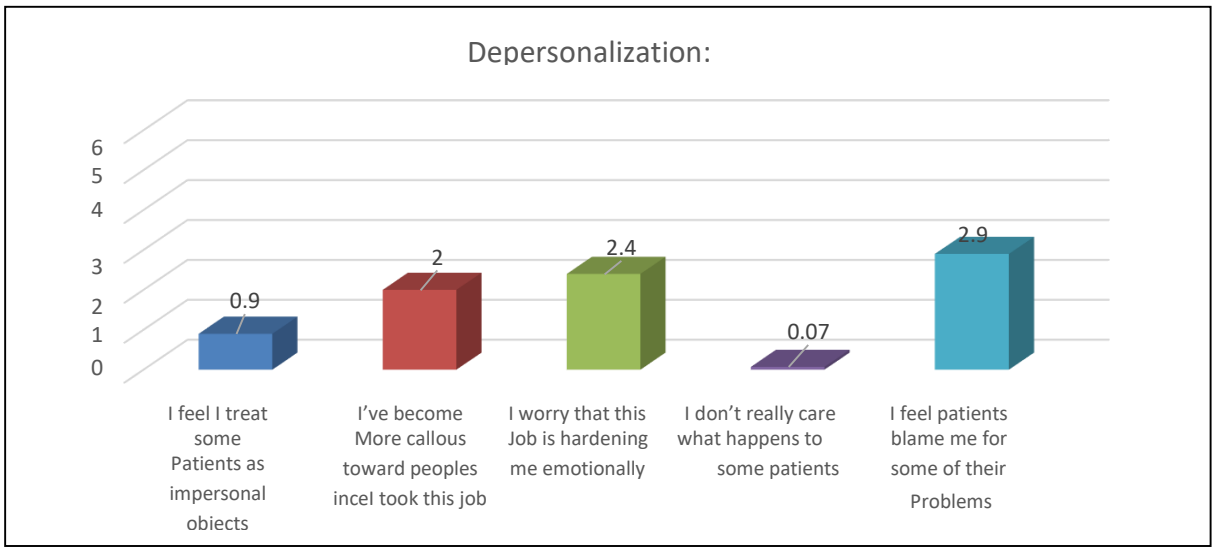

Figure 2 The average degree of response of the study sample to the DP dimension

Personal accomplishment

Figure 3 shows the responses for the PA dimension. The average response of the participants to the PA dimension items is 4.3 out of 6, which indicates a high PA score.

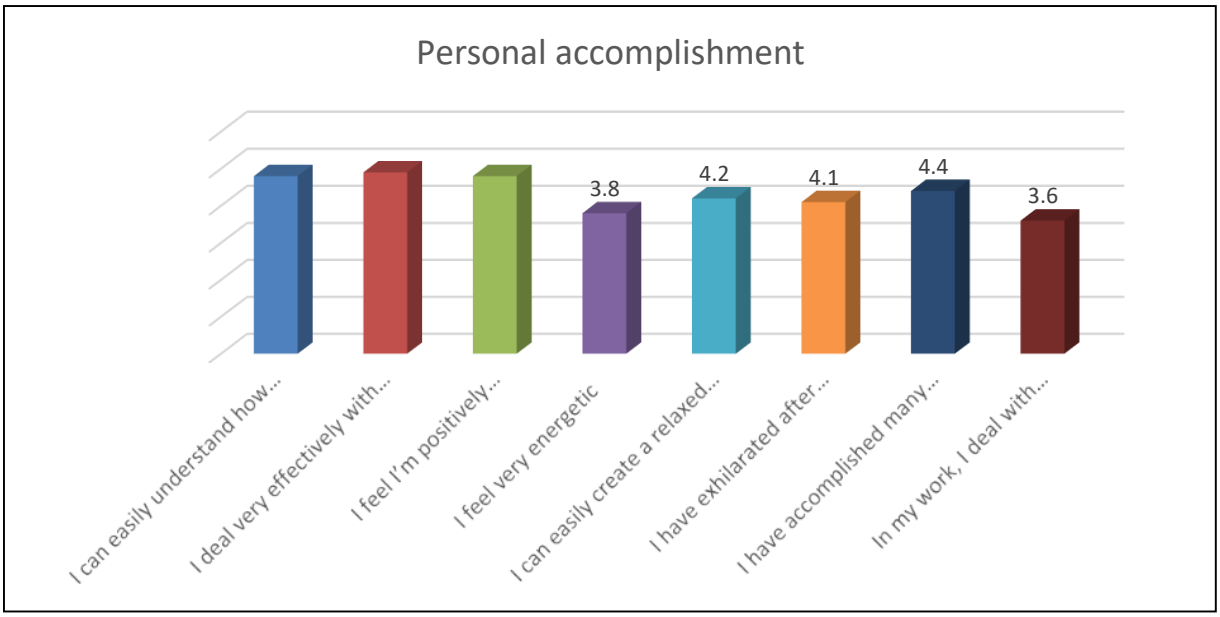

Figure 3 The average degree of response of the study sample to the PA dimension

Total score of the three dimensions

Table 1 shows the total score for the three dimensions, where a high score indicates a higher level of the dimension. Each dimension's average score was calculated by dividing the total score of each participant over the total number of questions.

Table 1 Means and standard deviations for the MBI-HSS MP domains

Dimensions and total score	M	SD	Level
Emotional exhaustion	28.03	12.36	High
Depersonalisation	8.81	6.03	Moderate
Personal accomplishment	34.66	8.56	Moderate
Total	71.50	16.32	High burnout

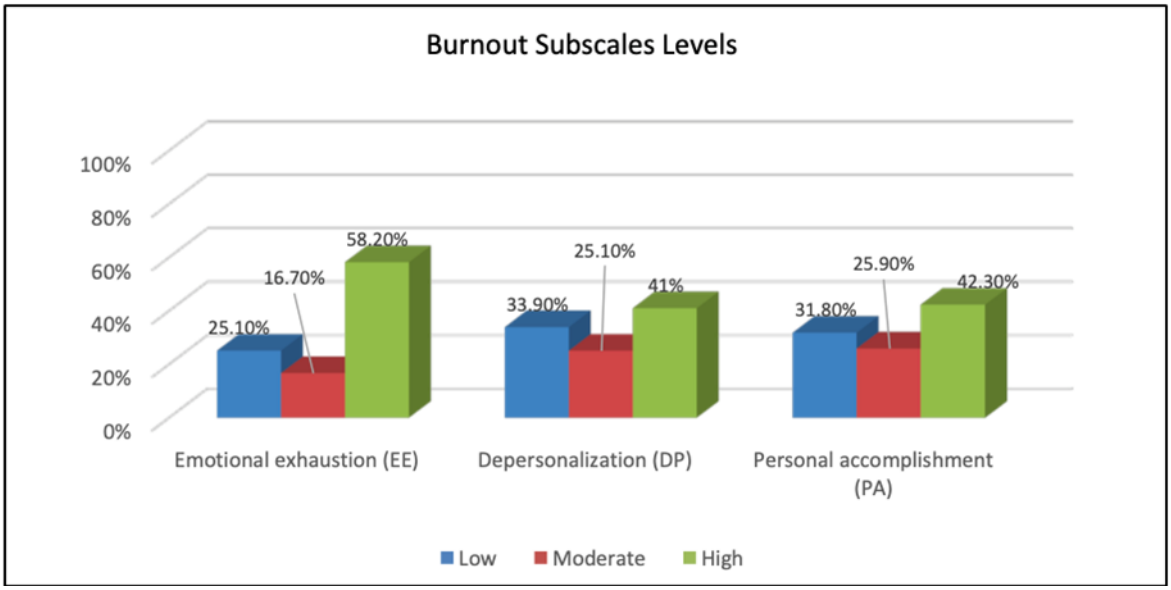

Figure 4 Percentage of MBI-HSS subscale score (low, moderate, and high score) for HCWs

As Figure 4 shows, 25.1% (n = 60) of HCWs showed a low score, 16.7% (n = 40) showed a moderate score, and 58.2% (n = 139) showed a high score for the EE dimension. In addition, 33.9% (n = 81) of HCWs showed a low score, 25.1% (n = 60) showed a moderate score, and 41% (n = 98) showed a high score for the DP dimension. Finally, 42.3% (n = 101) of HCWs showed a high score, 25.9% (n = 62) showed a moderate score, and 31.8% (n = 76) showed a low score for the PA dimension. A higher score indicates higher burnout, excluding for the PA scale, which is scored in reverse, as a low score on this dimension is associated with a high level of burnout.

HCWs' overall burnout level

Participants were further divided into high-burnout and low–moderate-burnout groups. All participants with a high score in one or more of these three domains were included in the high-burnout group (82%). The rest were included in the low– moderate-burnout group (18%).

Effect of demographics on burnout level

The scores of each domain were compared using inferential statistics to compare for various demographic characteristics. Table 2 displays the test's findings. Accordingly, the prevalence of high burnout was 82%. By using the chi-square test, participants in the high-burnout group were significantly younger, aged between 23 and 28 years (p = .002) (Table 3). Using binary and multi-regression analysis, working as a non-physician or physician in a medical specialty is a predictor of burnout. By looking at the odds ratios, medical specialty and non-physician are 1.031 and 1.053 times, respectively, more likely to experience burnout compared to other specialties.

Table 2 Comparison among EE, DP, and PA regarding demographic variables

Variables	Category	Emotional exhaustion (EE)		Depersonalisation (DP)		Personal accomplishment (PA)	
		Mean rank	p-value	Mean rank	p-value	Mean rank	p-value
Gender*	Male	107.51	.003	105.97	.012	118.37	.698
	Female	134.17		137.90		121.84	
Age**	23–28	125.93	.760	124.37	.003	95.24	.004
	29–33	118.68		140.06		119.94	
	34–40	121.34		118.16		133.82	
	41–65	112.47		93.29		136.98	
Job title*	Physician	105.97	>.001	121.93	.626	116.88	.430
	Non-physician	137.90		117.54		123.99	
Workplace**	General hospital	117.25	.202	124.63	.321	115.16	.141
	Special hospital	138.02		123.10		139.97	

	Primary healthcare	107.63		105.46		113.10	
	Others	137.88		101.79		142.21	
Specialty**	Medical	105.04	.006	128.20	.432	127.54	.002

Table 3 Characteristics of participants stratified by burnout status

Variables	Category	High burnout (n = 196) (82%)	Low–moderate burnout (n = 43) (18%)	p-value
Gender	Male	103 (43.1%)	24 (10%)	.698
	Female	93 (38.9%)	19 (7.9%)	
Age	23–28	60 (25.1%)	8 (3.3%)	.002
	29–33	57 (23.8%)	4 (1.7%)	
	34–40	41 (17.2%)	16 (6.7%)	
	41–65	38 (15.9%)	15 (6.3%)	
Job title	Physician	110 (46%)	24 (10%)	.971
	Non-physician	86 (36%)	19 (7.9%)	
Workplace	General hospital	124 (51.9%)	32 (13.4%)	.575
	Special hospital	27 (11.3%)	4 (1.7%)	
	Primary healthcare	30 (12.65)	5 (2.1)	
	Others	15 (6.3%)	2 (0.8%)	
Specialty	Medical	77 (32.3%)	15 (6.3%)	.169
	Surgical	10 (4.2%)	6 (2.5%)	

Effect of health and well-being on burnout level

The Mann–Whitney U test was used to compare scores in each domain with the health and well-being of HCWs. There was a difference in the mean EE and DP scores of chronic stress and impaired sleep quality. Regarding smoking, the results show a difference among the means in the three domains. A difference has been noted between smokers' average EE score and non-smokers' average DP and PA scores. Lastly, regarding illicit drug use, there is a difference between substance users' average EE and DP scores and non-users' average PA score. Chi-square test results presented in Table 4 show that the participants in the high-burnout group significantly had chronic stress ($p = .04$) and disrupted sleep quality since the onset of the pandemic to the present ($p = .002$).

The relationship between the well-being of HCWs and burnout was assessed using linear regression. In the model, health and well-being were entered as the dependent variables, and the predictor of the model was burnout. Furthermore, the burnout predictor explained 13.8% of the variance in HCWs' health and well-being. A reverse and significant relationship was observed among well-being, health, and burnout, so an increase in burnout level by one point led to a 0.025 decrease in HCWs' health and well-being levels. Furthermore, the burnout predictor explained 13.8% of the variance in HCWs' health and well-being. Finally, to assess the correlation between the score of each MBI-HHS MP domain and the level of health and well-being, Spearman correlation coefficients were calculated. There is a statistically significant inverse correlation ($\alpha = 0.01$) between the EE, DP, and total score, on one hand, and health and well-being, on the other and there is a positive, statistically significant correlation ($\alpha = 0.05$) between PA and HCWs health and well-being.

Table 4 Comparison between high and low–moderate burnout levels in relation to health and well-being

Variables	Category	High burnout (n = 196) (82%)	Low–moderate burnout (n = 43) (18%)	p-value
Past history of COVID-19 infection	Yes	46 (19.2%)	14 (5.9%)	.213
	No	150 (62.8%)	29 (12.1%)	
Chronic stress	Yes	68 (28.5%)	8 (3.3%)	.04
	No	128 (53.6%)	35 (14.6%)	
Quality of sleep	Yes	120 (50.2%)	15 (6.3%)	.002
	No	76 (31.8%)	28 (11.7%)	
Smoking	Yes	43 (18%)	4 (1.7%)	.059
	No	153 (64%)	39 (16.3%)	
Alcohol use	Yes	1 (0.4%)	0 (0%)	.639
	No	195 (81.6%)	43 (18%)	
Illicit drug use	Yes	4 (1.7%)	0 (0%)	.345
	No	192 (80.3%)	43 (18)	

4. DISCUSSION

The incidence of burnout and its contributing factors among HCWs has been the subject of numerous regional and international studies. According to the current study, 82% of the individuals had severe burnout. EE was high among 58.2% of individuals, DP was high among 41%, and PA was low among 31.8%. A concomitant Saudi study (n = 646) found a similar burnout rate (75% of the participants) (Alsulimani et al., 2021). However, this minor difference may arise from the different utilization of the burnout measurement tool. The CBI does not rate burnout on a scale of low to high, but rather as present or absent. Internationally, a study (n = 2,707) conducted in 60 countries found a lower burnout rate (51.4%) (Morgantini et al., 2020). This can be explained by the fact that the current study utilized a validated questionnaire to measure burnout rather than direct questions as in the former study.

Numerous studies support the inverse relationship between age and the severity of burnout (Alsulimani et al., 2021; Alanazi et al., 2020; Ferry et al., 2020; Salyers et al., 2016; Amoafo et al., 2014). In this study, the relationship between burnout and age reveals significantly low PA and high DP among those who are less than 33 years old, and it is most prevalent among those aged between 23 and 28 years ($p = 0.002$). This finding may be explained by the nature of younger age groups as they are more affected by social isolation as a result of the lockdown, and they have fewer years of experience than senior HCWs (Al Sulais et al., 2020).

Several studies have found a link between female gender and burnout. In this study, female HCWs had considerably higher burnout levels in the EE and DP domains than male HCWs. Previous research yielded similar results (Xing et al., 2020; Templeton et al., 2019). This might be explained by the overlap between home and work commitments, as females have many domestic duties at home which limit their opportunities for self-care (Jolly et al., 2014). Almost 70% of female physicians reported experiencing gender discrimination, which affects the well-being of female physicians and their perception of work stress (Jagsi et al., 2016).

This study revealed that non-physicians are the most prone to experiencing burnout, as shown by their high EE score, when compared to other occupational categories. According to a study conducted in Japan, more than 40% of nurses, 30% of radiologic technologists, and 30% of pharmacists met the burnout criterion (Matsuo et al., 2020). When compared to physicians, non-physicians have less skill discretion and decision authority, which may lead to more burnout (Rafferty et al., 2001). According to a systematic review and meta-analysis of 26 studies (n = 4,664), burnout was highly detected among surgical specialties (40.8%) (Rodrigues et al., 2018).

The current study found a similar result. There was a significantly high degree of EE among staff working in surgical specialties. This could be the outcome of their urgency routine, as surgical physicians deal with more life-threatening cases and have overloaded shifts. In contrast, a recent Saudi study showed that surgical physicians have low burnout levels (Alanazi et al., 2020). This could be attributed to a reduction in the number of surgeries performed per day during the pandemic. In addition, medical physicians have significantly lower levels of PA ($p = 0.002$) and a higher burnout rate than surgical physicians; however, this difference did not reach a significant level ($p = 0.169$). A previous study showed that internal medicine physicians are more likely than other professionals to experience work- related burnout because medical physicians, especially ICU and emergency physicians

are facing critical COVID-19 cases (West et al., 2018).

This study examined the relationship between burnout and years of experience and found that HCWs with fewer than 15 years of experience have significantly high EE and DP levels, which is supported by many studies (Alanazi et al., 2020; Al-Omari et al., 2019). This is because they may have immature coping strategies for workload and stress. Almost 56% (n = 135) of our study participants reported sleep disturbance, and 88.9% (n = 120) of them had a significantly high burnout level. Sleep disturbance is significantly associated with higher EE and DP. Numerous factors may contribute to the sleep quality, including long working shifts, and worry for family members with anxieties about infecting them and loved ones (Jahrami et al., 2020).

In this study, having chronic stress was significantly associated with high EE. 30% of respondents (n = 76) reported chronic stress issues, and 89.5% of them had significantly high burnout levels. One study shows a positive statistical correlation between well-being scores and financial stress (Mirza et al., 2018). Another study shows that marital conflict strongly predicts burnout (Amoafo et al., 2014).

This study has both limitations and points of strength. This study used an online survey disseminated through social media for data collection. This was required to follow the COVID-19 pandemic's regulations on remote socializing. Nevertheless, this has raised the possibility of selection bias, resulting in excessive representation of HCWs who more actively participate on social media platforms. This decreased the likelihood of the survey being completed and increased the difficulty of delivering the survey to all possible respondents, which resulted in a small sample size (n = 239). This study used the MBI-HSS MP, a validated tool to measure burnout rate, which contributes to the study's credibility.

5. CONCLUSION

According to this study, a high rate of the participants (82%) experienced high burnout during the COVID-19 pandemic. Younger HCWs and those with chronic stress and impaired sleep quality were discovered to be connected to excessive burnout. In addition, non-physicians and physicians of medical specialties were considered predictors of burnout. Moreover, there is a negative association between high burnout and health and well-being among HCWs. Finally, counseling for HCWs should be considered by the appropriate authorities in order to enhance psychological resilience during pandemics. Follow-up studies are recommended to examine and analyze the long-term consequences of the pandemic and measure the burnout rate after the pandemic is over.

Authors' contribution

Hanan Elsayed: discussion and conclusion
Enas Aljohani: statistical analysis
Zainab Jeddo: methodology
Rama Alraheili: introduction
Ghazal Alsisi: results
Aaesha Alkayyal: discussion and conclusion

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Conflicts of interest

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are present in the paper.

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