

# Burnout Among ICU and Non-ICU Healthcare Professionals in Saudi Arabia: A Comparative Cross-Sectional Analysis

Gokul G Krishna<sup>1</sup>, Noran Mohammed Ali Harbli<sup>1</sup>, Nanditha Krishnan<sup>1</sup>, Lamees Bandar Ghundul<sup>1</sup>, Rana Aldhahri<sup>1</sup>, Amna Badar Aldossary<sup>1</sup>, Aaya Osama Margalani<sup>1</sup>, Mohammed Almeshari<sup>2</sup>, Khalid S Alwadeai<sup>2</sup>, Riyadh A Alshehri<sup>3</sup>, Abdulrahman Ali A Alkhathami<sup>4</sup>, Jithin K Sreedharan<sup>5</sup>, Ayedh Dhafer AlAhmari<sup>2</sup>

<sup>1</sup>Department of Respiratory Therapy, Batterjee Medical College, Jeddah, Saudi Arabia; <sup>2</sup>Department of Rehabilitation Health Sciences, College of Applied Medical Sciences, King Saud University, Riyadh, Saudi Arabia; <sup>3</sup>Department of Respiratory Care Services, King Abdullah Specialized Children Hospital, Jeddah, Saudi Arabia; <sup>4</sup>Department of Specialized Therapy and Clinical Services, John Hopkins Aramco Healthcare, Dhahran, Saudi Arabia; <sup>5</sup>Department of Respiratory Therapy, College of Health Sciences, University of Doha for Science and Technology, Doha, Qatar

Correspondence: Ayedh Dhafer AlAhmari, Department of Rehabilitation Health Sciences, College of Applied Medical Sciences, King Saud University, Riyadh, Saudi Arabia, Tel +966 503477448, Email aalahmari9@ksu.edu.sa

**Purpose:** Burnout syndrome is a significant concern among healthcare workers, particularly in the high-stress environment of ICUs. This study evaluates and compares the levels of burnout among healthcare workers in the ICU and non-ICU settings and to assess the influence of sociodemographic characteristics.

**Materials and Methods:** A cross-sectional survey was conducted using MBI questionnaire, which measures emotional exhaustion (EE), depersonalization (DP), and personal accomplishment (PA).

**Results:** Among 844 participants (51.7% female), most were aged 25–34 (41.9%), single (46.7%), and worked in non-ICU settings (61.8%). They predominantly worked in governmental hospitals, with 1–4 years of experience (46.8%), managing 6–10 patients per shift (36.5%), and working 16–20 shifts monthly (75.8%). ICU staff reported significantly higher EE (21 [18] vs 11.5 [15],  $p \leq 0.0001$ ) and DP (17 [19] vs 8 [12],  $p \leq 0.0001$ ), and lower PA (35 [19] vs 42.5 [12],  $p \leq 0.0001$ ). Post-hoc analysis showed ICU workers were significantly more prone to moderate (Adj. Resid. = 3.57,  $p < 0.001$ ) and severe EE (Adj. Resid. = 5.20,  $p < 0.001$ ). In the DP domain, they were more likely to experience severe DP (Adj. Resid. = 9.22,  $p < 0.001$ ). Severe burnout in PA was also more likely among ICU staff (Adj. Resid. = 5.67,  $p < 0.001$ ). Nurses and RTs reported higher EE and DP. Married ICU staff had lower EE (OR: 0.453) but higher DP (OR: 1.623). Factors like 6–8 years of experience, 8-hour shifts, and fewer monthly shifts were associated with reduced EE and higher PA, while additional jobs were linked to increased DP.

**Conclusion:** ICU healthcare workers experienced significant burnout compared to non-ICUs staff, with nurses and RTs being the most affected. Sociodemographic factors such as marital status, years of experience, shift duration, and holding additional jobs increased burnout risk. These findings underscore the need for targeted interventions in high-stress environments like the ICU.

**Keywords:** long term stress, healthcare employees, emotional exhaustion, depersonalization, personal accomplishment, occupational stress

## Introduction

Burnout syndrome, characterized by psychological and emotional exhaustion, has emerged as a significant concern among healthcare workers, particularly those exposed to chronic interpersonal stressors.<sup>1</sup> According to the World Health Organization (WHO), burnout is a syndrome resulting from chronic workplace stress that has not been successfully managed.<sup>2</sup> This condition not only compromises the well-being and quality of life of healthcare workers but also negatively impacts their performance and the quality of patient care.<sup>3</sup> Moreover, burnout has been associated with various physical health issues, including respiratory, cardiac, and gastrointestinal disorders, type 2 diabetes,

hypercholesterolemia, chronic fatigue, and musculoskeletal pain, as well as mental health issues such as depression, anxiety, insomnia, increased alcohol consumption, and suicidal thoughts.<sup>4–6</sup>

Intensive Care Unit (ICU) represents one of the most demanding healthcare environments, where workers are responsible for managing patients with life-threatening conditions, often under intense pressure.<sup>7,8</sup> The high patient mortality rates, critical medical decisions, and complex ethical dilemmas in ICU settings contribute to elevated stress levels.<sup>9</sup> In contrast, non-ICU environments, such as general wards or outpatient clinics, may be less intense, but the cumulative stress from chronic patient management and administrative responsibilities can also lead to burnout.<sup>10,11</sup>

Globally, burnout among healthcare workers has become increasingly common, with particularly high rates observed in high-stress environments like ICUs.<sup>12</sup> The COVID-19 pandemic has significantly impacted the mental health of healthcare professionals, especially those on the frontlines. Studies have shown that frontline healthcare workers experienced heightened psychological distress, fear, and anxiety during the pandemic, with those lacking specific COVID-19 management training facing more severe psychological challenges. This unique context of pandemic-related stress brought much needed attention to physical and mental well-being of healthcare care professionals and underscored the need to recognize specific stressors, identify contributing factors, develop effective coping strategies and preventive measures.<sup>13–16</sup>

Burnout's impact varies significantly across different sociodemographic groups, influenced by factors such as age, gender, educational background, and socioeconomic status.<sup>17</sup> Comprehending how these factors affect the prevalence and severity of burnout is essential to designing targeted interventions.<sup>18</sup> Although previous research has explored burnout among healthcare professionals, there is limited knowledge regarding the differences in burnout between ICU and non-ICU settings.<sup>14,19</sup>

Therefore, the aim of the study is to compare the burnout levels among health care professionals working in ICUs and non-ICUs settings. We hypothesized that healthcare professionals working in ICUs experience higher levels of burnout compared to those in non-ICU settings. Additionally, we sought to explore the association between sociodemographic characteristics and burnout rates. We hypothesized that sociodemographic characteristics are significantly associated with variations in burnout rates.

## Material and Methods

A cross-sectional research design was utilized to collect data from critical care and non-critical care health providers in Saudi Arabia. The study population included participants aged above 18 years, including physicians, nurses, physical therapists, and respiratory therapists. A convenience sampling technique was employed, and participants were identified through hospital staff directories, departmental contact lists, and professional networks. Eligible participants were recruited via Email invitations containing an informed consent form and a link to a self-administered electronic survey which included questions on demographic information, work conditions, and workload developed using Google Forms. To expand recruitment, social media platforms such as LinkedIn, Twitter, and professional Facebook groups were also utilized to share the survey link. The data collection period extended from August 1, 2022, to July 30, 2023, with two monthly reminders sent via Email and social media to increase the response rate.

## Study Tool

We utilized the licensed Maslach Burnout Inventory (MBI) questionnaire, which is a widely recognized and validated tool used to measure burnout among professionals.<sup>7,20,21</sup> MBI assesses burnout through three core dimensions: Emotional Exhaustion (EE), Depersonalization (DP), and Personal Accomplishment (PA). Emotional Exhaustion measures feelings of being emotionally overextended and exhausted by one's work; depersonalization assesses an unfeeling and impersonal response toward recipients of one's care or service; and Personal Accomplishment evaluates feelings of competence and successful achievement in one's work.

The questionnaire consists of 22 items, each rated on a 7-point Likert scale ranging from 0 ("Never") to 6 ("Every day"), providing a detailed and nuanced understanding of burnout levels. Each subscale is scored separately: EE has a score range of 0–54, with higher scores indicating higher levels of emotional exhaustion; DP has a score range of 0–30, with higher scores indicating higher levels of depersonalization; and PA has a score range of 0–48, with higher

scores indicating higher levels of personal accomplishment, although lower scores on this subscale are indicative of higher burnout levels. Burnout is generally considered present if high scores are observed for EE and DP, along with low scores for PA.

## Statistical Analysis

The data were presented using numbers and proportions for categorical variables, and medians with interquartile ranges (IQR) were used for continuous variables. Shapiro Wilk normality test showed the data were not normally distributed. Non-parametric tests such as Kruskal–Wallis test was applied for group comparisons of continuous data. The Chi-square test was applied for categorical data comparisons. The associations were estimated via odds ratios (OR) and their respective 95% CI in multiple logistic regression analyses. The statistical analysis was processed using the Statistical Package for Social Sciences (SPSS) software version 28 (SPSS Inc., Chicago, IL, USA).

## Ethical Considerations

All subjects provided their informed written consent online before participating in the study. The study received approval from the institutional ethical committee of Batterjee Medical college (*RES-2022-0055*) and the study adhered to the principles of the Declaration of Helsinki.

## Results

The study sample included 844 individuals, of which was 51.7% females. The largest age group was 25–34 (41.9%). Most participants were never married (46.7%). Most participants were nurses (%), followed by respiratory therapists (%). Most participants were primarily employed by governmental hospitals (47.3%), and most participants were working in non-ICU settings (61.8%). Experience levels showed that 46.8% had 1–4 years of experience. Most participants worked 16–20 shifts per month (75.8%), with a common patient load of 6–10 per shift (36.5%), followed by 11–20 patients (30.6%) detailed demographics can be found in [Table 1](#).

ICU staff reported significantly higher levels of EE with a median score of 21 (IQR = 18) representing a moderate level of burnout, compared to non-ICU staff who had a median score of 11.50 (IQR = 15) representing a low level of

**Table 1** Sociodemographic Characteristics (n = 844)

Variable	Frequency (%)
Gender	
Male	408 (48.3)
Female	436 (51.7)
Age in years	
18–24	206 (24.4)
25–34	354 (41.9)
35–44	176 (20.9)
>45	108 (12.8)
Marital status	
Married	345 (40.9)
Single	394 (46.7)
Divorced/ Separated	105 (12.4)

(Continued)

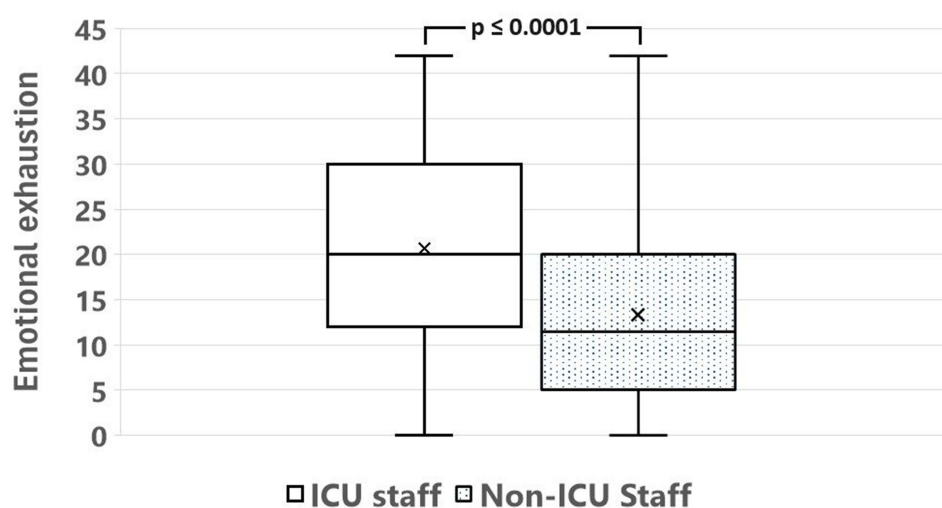
**Table 1** (Continued).

Variable	Frequency (%)
Profession	
Doctors	67 (7.9)
Nurses	233 (27.6)
Respiratory therapist	442 (52.4)
Physical therapist	102 (12.1)
Type of healthcare facility working on	
Government	399 (47.3)
Private	284 (33.8)
Clinic	161 (19.1)
Specialty working on	
ICU	322 (38.2)
Non-ICU	522 (61.8)
Number of years of experience	
1–4 years	395 (46.8)
5–10 years	254 (30.1)
>10 years	195 (23.1)
Number of hours per shift	
12 hours	549 (65)
8 hours	295 (35)
Number of patients to take care per shift	
1–5	182 (21.6)
6–10	308 (36.5)
11–20	221 (26.2)
>20	133 (15.8)
Number of shifts per month	
5–9	96 (11.4)
10–15	108 (12.8)
16–20	640 (75.8)
Any additional jobs	
Yes	127 (15)
No	717 (85)

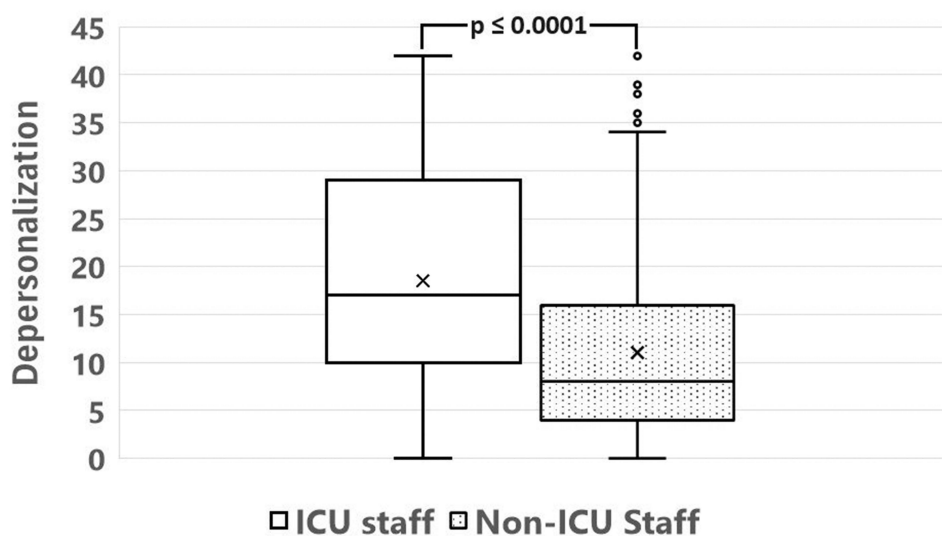
**Abbreviation:** ICU: Intensive Care Unit.

burnout ( $p \leq 0.0001$ , Figure 1). Similarly, ICU staff had higher DP scores, with a median of 17 (IQR = 19), representing a high-level burnout in this domain, whereas non-ICU staff had a moderate burnout median score of 8 (IQR = 12) ( $p \leq 0.0001$ , Figure 2). In terms of PA, ICU staff reported lower scores with a median of 35 (IQR = 19) which is considered a moderate level burnout compared to low level burnout in non-ICU staff who had a median score of 42.50 (IQR = 12) ( $p \leq 0.0001$ , Figure 3).

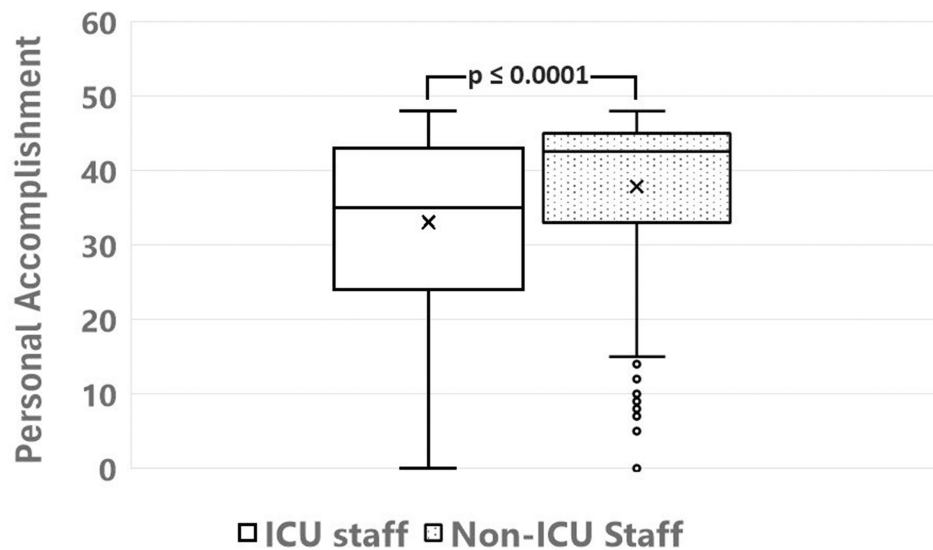
In EE domain, a significant overall difference was found,  $\chi^2$  (df = 2) = 52.14,  $p < 0.001$ . Post-hoc analysis with Bonferroni correction for adjusted residuals showed that ICU workers were significantly less likely to experience mild burnout (Adj = -6.89,  $p < 0.001$ ), but more likely to experience moderate (Adj Residual = 3.57,  $p < 0.001$ ) and severe burnout (Adj Residual = 5.20,  $p < 0.001$ ) than expected. Conversely, non-ICU workers were significantly more likely to experience mild burnout (Adj Residual = 6.89,  $p < 0.001$ ) and less likely to experience moderate (Adj Residual = -3.57,  $p < 0.001$ ) and severe burnout (Adj Residual = -5.20,  $p < 0.001$ ).



**Figure 1** Emotional exhaustion score among ICU and non-ICU staff (Figure Indicator “x” is the mean value).



**Figure 2** Depersonalization score among ICU and non-ICU staff (Figure indicator “x” represents the mean value, and “oooo” indicates outliers).



**Figure 3** Personal achievement score among ICU and non-ICU staff (Figure indicator “x” represents the mean value, and “oooo” indicates outliers).

In DP domain, a significant difference was observed,  $\chi^2$  (df = 2) = 90.60,  $p < 0.001$ . Post-hoc analysis indicated that ICU workers were significantly less likely to experience mild depersonalization (Adj Residual =  $-7.13$ ,  $p < 0.001$ ) and moderate depersonalization (Adj Residual =  $-3.49$ ,  $p < 0.001$ ), but significantly more likely to experience severe depersonalization (Adj Residual =  $9.22$ ,  $p < 0.001$ ) than expected. Non-ICU workers, on the other hand, were more likely to experience mild (Adj Residual =  $7.13$ ,  $p < 0.001$ ) and moderate depersonalization (Adj Residual =  $3.49$ ,  $p < 0.001$ ) while being less likely to experience severe depersonalization (Adj Residual =  $-9.22$ ,  $p < 0.001$ ).

In PA domain, significant differences were also found,  $\chi^2$  (df = 2) = 46.21,  $p < 0.001$ . ICU workers were significantly less likely to experience mild burnout (Adj Residual =  $-6.72$ ,  $p < 0.001$ ) and more likely to experience severe burnout (Adj Residual =  $5.67$ ,  $p < 0.001$ ) than expected. Non-ICU workers were more likely to report mild burnout (Adj Residual =  $6.72$ ,  $p < 0.001$ ) and less likely to report severe burnout (Adj Residual =  $-5.67$ ,  $p < 0.001$ ) (Table 2). These findings further align with our hypothesis that ICU professionals experience greater burnout compared to non-ICU professionals.

The MBI questionnaire results revealed significant differences in burnout levels among healthcare professionals. In the EE domain, further pairwise comparisons showed a statistically significant difference in median (IQR) scores

**Table 2** Prevalence of Burnout Among Emotional Exhaustion, Depersonalization and Personal Achievement Domains

Dimensions	Category	ICU Staff Frequency (%)	Non-ICU Staff Frequency (%)	p-Value
<b>Emotional exhaustion</b>	Low level	141(43.79)	354(67.8)	< 0.001
	Moderate level	111(34.48)	121(23.2)	
	High level	70(21.73)	47(9)	
<b>Depersonalization</b>	Low level	36(11.20)	172(33)	< 0.001
	Moderate level	63(19.60)	159(30.50)	
	High level	223(69.30)	191(36.60)	
<b>Personal Achievement</b>	Low level	124(38.50)	325(62.30)	< 0.001
	Moderate level	56(17.40)	65(12.50)	
	High level	142(44.10)	132(25.30)	

between nurses 16 (20) and physical therapists 8 (12) ( $p \leq 0.0001$ ), as well as between respiratory therapists 16 (17) and physical therapists 8 (12) ( $p = 0.002$ ). In the DP domain, nurses 14 (18) had significantly higher scores compared to physical therapists 5.5 (10) ( $p \leq 0.0001$ ), and similarly, respiratory therapists 13 (15) scored significantly higher than physical therapists 5.5 (10) ( $p \leq 0.0001$ ). For PA, physical therapists 44 (9) had significantly higher scores than both nurses 40 (17) ( $p \leq 0.0001$ ) and respiratory therapists 39 (16) ( $p = 0.002$ ) (Table 3).

The regression analysis presents the adjusted odds ratios (Adj. OR), 95% confidence intervals (95% CI), and p-values for the associations between various covariates and the three domains, with comparisons made relative to the reference groups (Table 4). We found a significant association between sociodemographic factors and burnout dimensions. Female gender and age were not significantly associated with any burnout dimensions. However, being married was linked to lower EE (Adj OR = 0.453, 95% CI: 0.257–0.816), but higher DP (Adj OR = 1.623, 95% CI: 1.019–2.584), while being divorced/separated was associated with lower EE (Adj OR = 0.558, 95% CI: 0.336–0.926), and significantly higher DP (Adj OR = 4.699, 95% CI: 2.498–8.838) and PA (Adj OR = 2.690, 95% CI: 0.199–0.694) compared to unmarried individuals. Nurses were more likely to experience high EE (Adj OR = 2.262, 95% CI: 1.080–4.737). Individuals with

**Table 3** Comparison of Maslach Burnout Inventory (MBI) Score Between Healthcare Professionals

	Physicians (n=67)	Nurses (n=233)	Respiratory Therapist (n=442)	Physical Therapist (n=102)	p-Value
<b>Emotional exhaustion Median (IQR)</b>	11(13)	16(20)	16(17)	8(12)	<0.0001
<b>Depersonalization Median (IQR)</b>	9(16)	14(18)	13(15)	5.50(10)	<0.0001
<b>Personal achievement Median (IQR)</b>	42(11)	40(17)	39(16)	44(9)	<0.0001

Abbreviation: IQR, Interquartile Range.

**Table 4** Regression Analysis for Sociodemographic Factors With Maslach Burnout Inventory (MBI) Score

Covariables	Emotional Exhaustion (High Versus Low Level)			Depersonalization (High Versus Low Level)			Reduced Personal Achievement (High versus Low Level)		
	Adj. OR <sup>a</sup>	95% CI <sup>b</sup>	p Value	Adj. OR	95% CI	p Value	Adj. OR	95% CI	p Value
<b>Male (reference)</b>									
Female	0.89	0.62–1.27	0.532	1.20	0.81–1.79	0.352	1.32	0.88–1.97	0.173
<b>Age group &gt;45 years (reference)</b>									
Age, 18–24 years	1.41	0.57–3.47	0.446	1.01	0.36–2.84	0.978	1.77	0.64–4.87	0.269
<b>Unmarried (reference)</b>									
Marital status- Married	0.45	0.25–0.81	0.008	1.62	1.01–2.58	0.041	0.74	0.46–1.19	0.219
Marital status- Divorced/ Separated	0.55	0.33–0.92	0.024	4.69	2.49–8.83	<0.001	2.69	0.19–0.69	0.002
<b>Physiotherapy (reference)</b>									
Nursing Profession	2.26	1.08–4.73	0.031	0.92	0.74–1.14	0.490	0.77	0.27–2.22	0.640
<b>9–12 years of experience (reference)</b>									
Number of years of experience, 6–8 years	0.33	0.17–0.62	0.001	0.98	0.47–2.03	0.959	0.61	0.30–1.24	0.175
<b>Number of hours per shift 12 hour/shift (reference)</b>									
Number of hours per shift, 8 hours/day	0.44	0.23–0.85	0.014	0.61	0.30–1.22	0.164	2.15	0.23–0.92	0.028

(Continued)

**Table 4** (Continued).

Covariables	Emotional Exhaustion (High Versus Low Level)			Depersonalization (High Versus Low Level)			Reduced Personal Achievement (High versus Low Level)		
	Adj. OR <sup>a</sup>	95% CI <sup>b</sup>	p Value	Adj. OR	95% CI	p Value	Adj. OR	95% CI	p Value
<b>Number of patients to take care per shift &gt;20 patients (reference)</b>									
Number of patients to take care per shift, 5–9 patients	0.57	0.34–0.95	0.034	0.50	0.29–0.86	0.013	1.07	0.60–1.91	0.80
Number of patients to take care per shift, 10–20 patients	0.43	0.26–0.73	0.002	0.29	0.16–0.53	<0.001	1.40	0.76–2.57	0.271
<b>Number of shifts per month 15–20 (reference)</b>									
Number of shifts per month, 5–10	0.28	0.14–0.54	<0.001	0.65	0.33–1.26	0.205	2.02	0.28–0.86	0.013
Number of shifts per month, 10–15 shift per month	0.43	0.25–0.73	0.002	0.51	0.28–0.94	0.032	0.69	0.40–1.18	0.178
Having an additional jobs	1.36	0.84–2.20	0.209	2.46	1.33–4.57	0.004	1.23	0.73–2.05	0.422

Notes: <sup>a</sup>Adj. OR: Adjusted Odds Ratio, <sup>b</sup>CI: Confidence Interval.

6–8 years of experience had lower odds of EE (OR = 0.331, CI: 0.176–0.623). Working 8-hour shifts was associated with lower EE (OR = 0.449,  $p = 0.014$ ) and greater PA reduction (OR = 2.155, CI: 0.234–0.920).

Managing fewer patients per shift (5–9) was linked to reduced EE (Adj. OR = 0.578, 95% CI: 0.348–0.958) and DP (Adj. OR = 0.503, 95% CI: 0.291–0.866), while handling 10–20 patients significantly lowered the odds of both EE (Adj. OR = 0.438 95% CI: 0.260–0.737) and DP Adj. OR = 0.292 (95% CI: 0.160–0.531). Working fewer monthly shifts (5–10) reduced EE (Adj. OR = 0.283, 95% CI: 0.147–0.546) and increased the risk of reduced PA (Adj. OR = 2.023, 95% CI: 0.284–0.862). Finally, holding an additional job was associated with higher DP (Adj. OR = 2.467, 95% CI: 1.331–4.572). These findings emphasize the impact of sociodemographic variables on burnout and underscore the differences in burnout experiences between ICU and non-ICU settings.

## Discussion

The current study observed heightened levels of EE, DP and reduced PA among ICU staff compared to non-ICU staff. Our study also underscores the significant disparities in burnout levels across different healthcare professions with nurses and respiratory therapists being the most affected. Additionally, marital status, job specialty, and number of shifts per month were significant predictors of burnout.

The ICU is widely recognized as a highly stressful environment, with numerous studies reporting a strong correlation between high stress setting and elevated rates of burnout syndrome (BOS) among healthcare professionals.<sup>8,22</sup> In the United States, overall burnout prevalence among health care professionals ranged from 0–80.5% where EE, DP, and low PA prevalence ranged from 0–86.2%, 0–89.9%, and 0–87.1%, respectively.<sup>10</sup> Poncet et al study included participants from 167 ICUs and revealed that 32.8% of the staff experienced severe burnout.<sup>9</sup> Furthermore, van Mol et al emphasized the prevalence of both burnout and compassion fatigue among ICU healthcare professionals, with 40% reporting high levels of burnout.<sup>23</sup> These findings highlighted the ongoing emotional and psychological strain endured by ICU staff working in critical care environments, where staff are regularly exposed to life-and-death situations and high patient acuity.<sup>24</sup> A previous study by Elshaer et al which involved 82 critical care healthcare workers in Saudi Arabia, reported higher rates of EE (36%), DP (28%), and reduced PA (47%) among ICU professionals. However, the study had certain limitations, such as the absence of a comparison with non-ICU staff and its primary focus on nurses and medical technicians. In contrast, our findings not only corroborate these results but also reveal that ICU staff experience significantly greater levels of EE, DP and reduced PA compared to their non-ICU staff.

Previous systematic reviews which showed moderate-to-high but wide-ranging prevalence of burnout among health-care providers in Arab countries.<sup>11</sup> Ashkar et al and Sabbah et al reported greater EE among doctors (67.7%) and nurses

(77.5%) in Lebanon,<sup>25,26</sup> whereas, tertiary single center studies in Saudi Arabia showed variable burnout rates among physicians and nurses, including EE (29.5%-54.0%), DP (15.7%-48.6%), and PA (17.0%-71.5%).<sup>27-29</sup> There are limited studies on burnout among respiratory therapists, Bai et al reported high burnout rates (68.4%) among pulmonologists or respiratory therapists, which was perceived to increase during the COVID-19 pandemic.<sup>30</sup> Additionally, Algarni et al single center study observed high prevalence of burnout rates among respiratory therapists.<sup>31</sup> These findings suggest that certain roles within healthcare settings are more susceptible to burnout, potentially due to the nature of their responsibilities and the intensity of patient care. These healthcare professionals often provide direct, continuous care to patients, which can be both physically and emotionally debilitating.<sup>27,30</sup> In our study nurses and respiratory therapists exhibited greater levels of EE and DP compared to physicians and physiotherapists.

This study findings were consistent with existing evidence, emphasizing the impact of sociodemographic factors on burnout. In the EE dimension, married individuals reported lower scores, which aligns with previous reports that strong social support networks could be protective against mental health challenges for healthcare workers.<sup>32,33</sup> However, the DP domain was affected in both married and divorced/separated individuals. Furthermore, greater DP was observed among married, divorced/separated individuals, and those with additional jobs corroborates with evidence that individuals with fewer social supports or additional stressors may experience greater emotional detachment.<sup>11,34</sup> Reduced PA among divorced/separated individuals and those with fewer shifts was consistent with findings that suggest a lack of personal and professional fulfillment in individuals facing more significant personal and job-related stress.<sup>35,36</sup>

While this study provides valuable insights, it is not without limitations. Cross-sectional design limits the ability to infer causality, and the reliance on self-reported measures may introduce response bias. Future research should prioritize longitudinal studies monitoring burnout in medical professionals over time in both intensive care and non-intensive care settings. Studies evaluating interventions like mindfulness training, peer support groups, and work-life balance programs are essential. Investigating organizational policies, such as limiting shift duration and adjusting workload, can offer further insights into burnout reduction strategies. Furthermore, policymakers should emphasize evidence-based interventions at individual and organizational levels, including counseling services, peer support programs, and improved workflow management to mitigate burnout.<sup>37-40</sup>

## Conclusion

In conclusion, ICU healthcare professionals experienced significant levels of burnout, with nurses and respiratory therapists being the most affected. This study also found that certain sociodemographic factors, including marital status, years of experience, shift duration, and additional jobs increase the risk of burnout. These findings emphasize the necessity of implementing targeted interventions that address burnout among healthcare workers who are particularly vulnerable to it in high-stress environments such as the ICU.

## Abbreviations

EE; Emotional exhaustion, DP; Depersonalization, PA; Personal accomplishment, MBI; Maslach Burnout Inventory questionnaire, IQR; interquartile ranges, OR; odds ratios, CI; Confidence intervals, ICU; Intensive Care Unit.

## Data Sharing Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

## Ethics Approval and Informed Consent

All subjects provided their informed written consent online before participating in the study. The study received approval from the institutional ethical committee (*RES-2024-0055*).

## Acknowledgments

The authors wish to express their gratitude to all who contributed to the completion of this research. The support and resources provided by colleagues and the institution were invaluable to this work.

## Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

## Funding

This research was conducted without any specific funding from public, commercial, or not-for-profit agencies.

## Disclosure

The author(s) declare(s) that there is no conflict of interest regarding the publication of this article.

## References

- Montero-Marín J, García-Campayo J, Mera DM, Del Hoyo YL. A new definition of burnout syndrome based on Farber's proposal. *J Occup Med Toxicol*. 2009;4:1–17.
- Jacobs C. *Occupational Stress and Burnout. Burnout Syndrome-Characteristics and Interventions*. IntechOpen; 2024.
- Rodrigues H, Cobucci R, Oliveira A, et al. Burnout syndrome among medical residents: a systematic review and meta-analysis. *PLoS One*. 2018;13(11):e0206840. doi:10.1371/journal.pone.0206840
- Salvagioni DAJ, Melanda FN, Mesas AE, González AD, Gabani FL, Andrade S. Physical, psychological and occupational consequences of job burnout: a systematic review of prospective studies. *PLoS One*. 2017;12(10):e0185781. doi:10.1371/journal.pone.0185781
- Schulz M, Damkröger A, Voltmer E, et al. Work-related behaviour and experience pattern in nurses: impact on physical and mental health. *J Psychiatric Mental Health Nurs*. 2011;18(5):411–417. doi:10.1111/j.1365-2850.2011.01691.x
- Bakhamis L, Paul III DP, Smith H, Coustasse A. Still an epidemic: the burnout syndrome in hospital registered nurses. *Health Care Manager*. 2019;38(1):3–10. doi:10.1097/HCM.0000000000000243
- Embriaco N, Papazian L, Kentish-Barnes N, Pochard F, Azoulay E. Burnout syndrome among critical care healthcare workers. *Curr Opinion Critical Care*. 2007;13(5):482–488. doi:10.1097/MCC.0b013e3282ef28a
- Donchin Y, Seagull FJ. The hostile environment of the intensive care unit. *Curr Opinion Critical Care*. 2002;8(4):316–320. doi:10.1097/00075198-200208000-00008
- Poncet MC, Toullic P, Papazian L, et al. Burnout syndrome in critical care nursing staff. *Am J Respir Crit Care Med*. 2007;175(7):698–704. doi:10.1164/rccm.200606-806OC
- Rotenstein LS, Torre M, Ramos MA, et al. Prevalence of burnout among physicians: a systematic review. *JAMA*. 2018;320(11):1131–1150. doi:10.1001/jama.2018.12777
- Elbarazi I, Loney T, Yousef S, Elias A. Prevalence of and factors associated with burnout among health care professionals in Arab countries: a systematic review. *BMC Health Serv Res*. 2017;17(1):1–10. doi:10.1186/s12913-017-2319-8
- Oliveira EG, Garcia PC, Citolino Filho CM, de Souza Nogueira L. The influence of delayed admission to intensive care unit on mortality and nursing workload: a cohort study. *Nurs Crit Care*. 2019;24(6):381–386. doi:10.1111/nicc.12402
- Iorga M, Muraru I-D, Hanganu B, Manolescu IS, Popa A, Ioan B-G. Burnout, alexithymia and job satisfaction in autopsy technicians. *Rom J Leg Med*. 2020;28(3):339–347. doi:10.4323/rjlm.2020.339
- Real-Ramírez J, García-Bello LA, Robles-García R, et al. Well-being status and post-traumatic stress symptoms in health workers attending mindfulness sessions during the early stage of the COVID-19 epidemic in Mexico. *Salud mental*. 2021;43(6):303–310. doi:10.17711/SM.0185-3325.2020.041
- Sipos D, Jenei T, Kövesdi OL, et al. Burnout and occupational stress among Hungarian radiographers working in emergency and non-emergency departments during COVID-19 pandemic. *Radiography*. 2023;29(3):466–472. doi:10.1016/j.radi.2023.02.013
- Sipos D, Goyal R, Zapata T. Addressing burnout in the healthcare workforce: current realities and mitigation strategies. *Lancet Regional Health Eur*. 2024;42:100961. doi:10.1016/j.lanepe.2024.100961
- Leiter MP, Maslach C. Nurse turnover: the mediating role of burnout. *J Nurs Manage*. 2009;17(3):331–339. doi:10.1111/j.1365-2834.2009.01004.x
- Aryankhesal A, Mohammadibakhsh R, Hamidi Y, et al. Interventions on reducing burnout in physicians and nurses: a systematic review. *Med J Islamic Republic Iran*. 2019;33:77. doi:10.34171/mjiri.33.77
- Alvares MEM, Thomaz EBAF, Lamy ZC, Nina RVd AH, Pereira MUL, Garcia JBS. Burnout syndrome among healthcare professionals in intensive care units: a cross-sectional population-based study. *Revista Brasileira Terapia Intens*. 2020;32(2):251–260. doi:10.5935/0103-507X.20200036
- Barbosa FT, Leão BA, Tavares GMS, Santos J. Burnout syndrome and weekly workload of on-call physicians: cross-sectional study. *Sao Paulo Med J*. 2012;130(5):282–288. doi:10.1590/S1516-31802012000500003
- Raftopoulos V, Charalambous A, Talias M. The factors associated with the burnout syndrome and fatigue in Cypriot nurses: a census report. *BMC Public Health*. 2012;12(1):1–13. doi:10.1186/1471-2458-12-457
- Bakker AB, Le Blanc PM, Schaufeli WB. Burnout contagion among intensive care nurses. *J Adv Nurs*. 2005;51(3):276–287. doi:10.1111/j.1365-2648.2005.03494.x
- Van mol MM, Kompanje EJ, Benoit DD, Bakker J, Nijkamp MD. The prevalence of compassion fatigue and burnout among healthcare professionals in intensive care units: a systematic review. *PLoS One*. 2015;10(8):e0136955. doi:10.1371/journal.pone.0136955

24. Papazian L, Hraiech S, Loundou A, Herridge MS, Boyer L. High-level burnout in physicians and nurses working in adult ICUs: a systematic review and meta-analysis. *Intensive Care Med.* 2023;49(4):387–400. doi:10.1007/s00134-023-07025-8
25. Ashkar K, Romani M, Musharrafieh U, Chaaya M. Prevalence of burnout syndrome among medical residents: experience of a developing country. *Postgraduate Med J.* 2010;86(1015):266–271. doi:10.1136/pgmj.2009.092106
26. Ibtissam S, Hala S, Sanaa S, Hussein A, Nabil D. Burnout among Lebanese nurses: psychometric properties of the Maslach burnout inventory-human services survey (MBI-HSS). *Health.* 2012;2012:644–652.
27. Al-Turki HA, Al-Turki RA, Al-Dardas HA, et al. Burnout syndrome among multinational nurses working in Saudi Arabia. *Annals Afr Med.* 2010;9(4):226–229. doi:10.4103/1596-3519.70960
28. Al-Sareai N, Al-Khaldi Y, Mostafa O, Abdel-Fattah M. Magnitude and risk factors for burnout among primary health care physicians in Asir Province, Saudi Arabia. *East Mediterr Health J.* 2013;19(5):426–434. doi:10.26719/2013.19.5.426
29. Aldrees TM, Aleissa S, Zamakhshary M, Badri M, Sadat-Ali M. Physician well-being: prevalence of burnout and associated risk factors in a tertiary hospital, Riyadh, Saudi Arabia. *Ann Saudi Med.* 2013;33(5):451–456. doi:10.5144/0256-4947.2013.451
30. Bai X, Wan Z, Tang J, et al. The prevalence of burnout among pulmonologists or respiratory therapists pre-and post-COVID-19: a systematic review and meta-analysis. *Annals Med.* 2023;55(1):2234392. doi:10.1080/07853890.2023.2234392
31. Algarni SS, Alghib AA, Dahmash HAB, et al. Burnout among respiratory therapists in a tertiary hospital in Saudi Arabia. *Respiratory Care.* 2023;68(2):228–233. doi:10.4187/respcare.10140
32. Peng J, Wu WH, Doolan G, et al. Marital status and gender differences as key determinants of COVID-19 impact on wellbeing, job satisfaction and resilience in health care workers and staff working in academia in the UK during the first wave of the pandemic. *Front Public Health.* 2022;10:928107. doi:10.3389/fpubh.2022.928107
33. AlJhani S, AlHarbi H, AlJameli S, Hameed L, AlAql K, Alsulaimi M. Burnout and coping among healthcare providers working in Saudi Arabia during the COVID-19 pandemic. *Middle East Current Psychiatry.* 2021;28(1):29. doi:10.1186/s43045-021-00108-6
34. Hou T, Zhang T, Cai W, et al. Social support and mental health among health care workers during Coronavirus Disease 2019 outbreak: a moderated mediation model. *PLoS One.* 2020;15(5):e0233831. doi:10.1371/journal.pone.0233831
35. Elshaer NSM, Moustafa MSA, Aiad MW, Ramadan MIE. Job stress and burnout syndrome among critical care healthcare workers. *Alexandria Journal of Medicine.* 2018;54(3):273–277. doi:10.1016/j.ajme.2017.06.004
36. Pakou V, Tsartsalis D, Papathanakos G, Dragioti E, Gouva M, Koulouras V. Personality Traits, Burnout, and Psychopathology in Healthcare Professionals in Intensive Care Units—A Moderated Analysis. *MDPI.* 2024;12:587.
37. West CP, Dyrbye LN, Erwin PJ, Shanafelt TD. Interventions to prevent and reduce physician burnout: a systematic review and meta-analysis. *Lancet.* 2016;388(10057):2272–2281. doi:10.1016/S0140-6736(16)31279-X
38. Xu HG, Kynoch K, Tuckett A, Eley R. Effectiveness of interventions to reduce emergency department staff occupational stress and/or burnout: a systematic review. *JBIS Evidence Synth.* 2020;18(6):1156–1188. doi:10.11124/JBISIR-D-19-00252
39. da Silva FCT, Barbosa CP. The impact of the COVID-19 pandemic in an intensive care unit (ICU): psychiatric symptoms in healthcare professionals. *Prog Neuro Psychopharmacol Biol Psychiatry.* 2021;110:110299. doi:10.1016/j.pnpbp.2021.110299
40. Gualano MR, Sinigaglia T, Lo Moro G, et al. The burden of burnout among healthcare professionals of intensive care units and emergency departments during the COVID-19 pandemic: a systematic review. *Int J Environ Res Public Health.* 2021;18(15):8172. doi:10.3390/ijerph18158172