Original Article

Burnout among emergency and surgery residents

An exploration of contributing factors and implications

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ABSTRACT

الأهداف: تقييم مدى انتشار الإرهاق المهني بين المقيمين في الطوارئ والجراحة واستكشاف العوامل المرتبطة به.

المنهجية: أجريت هذه الدراسة في المملكة العربية السعودية خلال الفترة من يناير إلى مارس 2024م. تم استخدام تصميم المسح العرضي، حيث تم استخدام استبيان مقياس الإرهاق المهني - خدمات الإنسان ومقياس المرونة - 14 لقياس الإرهاق المهني والمرونة على التوالي. شمل الاستبيان معلومات ديموغرافية، وأسئلة متعلقة بالصحة، وعناصر محددة تتعلق بالإرهاق المهني. تم إجراء التحليلات الوصفية، وتوزيعات التردد، والتحليلات الاستدلالية لاستكشاف العلاقات بين الإرهاق المهني، والعوامل الديموغرافية، والمرونة.

النتائج: كشفت الدراسة عن تمثيل متنوع عبر العوامل الديموغرافية، مع تباين في مدى انتشار الإرهاق المهني. أفاد حوالي 63% من المشاركين بتجربتهم للإرهاق المهني، مع مستويات عالية من الإرهاق العاطفي (55%) وتجرد من المشاعر (28%). تباينت مستويات المرونة عبر الخصائص الديموغرافية المختلفة. وُجدت علاقات ذات دلالة إحصائية بين الإرهاق المهني وعوامل مثل الجنس، الحالة الاجتماعية، وجود الأطفال، التخصص، مدة الخبرة، والانضمام إلى برامج الدراسات العليا.

الخلاصة: تسلط النتائج الضوء على الحاجة الملحة إلى تدخلات مستهدفة لمعالجة الإرهاق المهني لدى العاملين في مجال الرعاية الصحية. تسلط العلاقات الدقيقة بين الإرهاق المهني، والمرونة، والعوامل الديموغرافية الضوء على أهمية استراتيجيات مخصصة للتخفيف من الإرهاق بشكل فعال. من الضروري معالجة الإرهاق المهني ليس فقط لرفاهية العاملين في مجال الرعاية الصحية ولكن أيضًا للحفاظ على رعاية المرضى عالية الجودة.

Objectives: To assess the prevalence of burnout among emergency and surgical residents and explore the associated factors.

Methods: This study was carried out at King Faisal University, Al Hofuf, Saudi Arabia, through the period from January to march 2024. A cross-sectional survey design was employed, utilizing the Maslach burnout inventory-human services survey and the resilience scale-14 to measure burnout and resilience. The survey included demographic information, health-related questions, and specific burnout-related items. Descriptive statistics, frequency distributions, and inferential analyses were carried out to explore the relationships between burnout, demographic factors, and resilience.

Results: The study revealed a diverse representation across demographic factors, with variations in burnout prevalence. Approximately 63% of participants reported experiencing burnout, with high levels of emotional exhaustion (55%) and depersonalization (28%). Resilience levels varied across different demographic characteristics. Significant associations were found between burnout and factors such as gender, marital status, having children, specialty, length of experience, and enrollment in postgraduate programs.

Conclusion: The findings underscore the urgent need for targeted interventions to address burnout in healthcare professionals. The nuanced relationships between burnout, resilience, and demographic factors highlight the importance of tailored strategies to mitigate burnout effectively. Addressing burnout is crucial not only for the well-being of healthcare professionals but also for maintaining high-quality patient care.

Keywords: burnout, resilience, emergency, surgery, residency

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Burnout is a common occurrence in many professional domains, but it is especially prominent in the demanding healthcare industry, impacting medical personnel from a wide range of specializations.[1-3] Its defining characteristics are chronic occupational stress that results in emotional weariness, depersonalization (DP), and a lessened sense of personal success.[4] Medical workers are especially susceptible to burnout due to a complex combination of factors such as extended working hours, heavy workloads, and the emotional strain of caring for distressed patients.[1] Research indicates that medical workers are 15 times more likely to suffer burnout than professionals in other fields, raising increasing concerns.[5] Furthermore, physician burnout is associated with reduced quality of patient care, an increase in medical errors, and risks to the health of the practitioners themselves (namely, coronary artery disease, peptic ulcer disease, sleep disturbances, and psychological disorders).[5,6]

In addition, burnout can be worsened by the usual expectations placed on residents and the hierarchical structure of medical education.[7] A resident's sense of isolation may be exacerbated by feelings of shame regarding showing vulnerability, concerns over professional reputation, and fear of judgment. This lack of psychological safety could worsen burnout and hinder the development of coping skills.[8] In a previous study, residents were found to have significantly higher burnout rates compared to other positions. Moreover, the study also noted that surgery and emergency medicine were among the specialties most affected.[9]

Residents in emergency and surgery disciplines work in high-stress settings as first responders to life-threatening medical emergencies. They regularly encounter surgical emergencies and trauma patients, which are considered high-acuity cases. These scenarios pose unique challenges due to extended work hours, life-or-death decisions, and a constant influx of patients.[10,11] Thus, the inherent nature of emergency and surgical residency work significantly contributes to burnout. Moreover, emergency situations' erratic and severe nature can cause persistent stress, which is a major risk factor for burnout.[4,12] In such an environment where life-threatening circumstances are common and immediate decisions are required, a high degree of resilience and adaptation are necessary. Consequently, residents may struggle to cope with the emotional burden of their duties, potentially exacerbating emotional exhaustion (EE) and leading to burnout.

The medical community faces a widespread and alarming problem with burnout among emergency and surgical residents, posing serious risks to the health of medical personnel and the overall standard of patient care.[1,3,9] Reduced job satisfaction, increased medical errors, and a deterioration in patient care quality have all been linked to burnout.[13] Furthermore, the increase in resident burnout due to the rigorous nature of medical residency, especially in emergency and surgical departments, is particularly concerning.[13,14] These factors underscore the urgent need to address this problem. Healthcare organizations can foster a culture of resilience, well-being, and support for their residents by implementing targeted measures that are informed by an awareness of the causes and consequences of burnout.

Due to the challenges faced by emergency and surgical residents, such as high-acuity situations, lengthy workdays, and difficult work-life balance, a thorough investigation of the prevalence, causes, and consequences of burnout within this specific population is required. By exploring the multifaceted nature of this issue and understanding the particular stressors involved, this research aims to identify key areas for intervention and propose strategies to promote these healthcare professionals' mental and emotional well-being. In the current study, we aimed to explore the prevalence of burnout among emergency and surgery residents in Saudi Arabia, as well as the complex interplay of variables that contribute to burnout in these residents.

Methods. This observatinal, cross-sectional study was carried out At King Faisal University, Al Hofuf, Saudi Arabia, through the period from January to march 2024. The research employed a survey to investigate burnout among emergency and surgical residents in Saudi Arabia. The survey consisted of 4 sections: demographics, health-related questions, the Maslach burnout inventory-human services survey (MBI-HSS), and the resilience scale-14 (RS-14).[15,16]

Participants included emergency and surgical residents from various medical institutions in Saudi Arabia. Participation was voluntary, and informed consent was requested from each participant before beginning the quesstionnaire. According to the ministry of health statistics, the total number of surgery and emergency residents were approximately 5370. After determining a tolerable error of 5%, the calculated sample size was 359. After adjustment for the response

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rate of 60%, the number of participants to be invited was 589. Follow up reminders using official e-mails provided by the hospitals were sent to improve the response rate. However, 367 respondents completed the survey with response rate of 62%. Inclusion criteria encompassed enrollment in emergency or surgical residency programs in Saudi Arabia, being aged 23 years or older, and voluntarily agreeing to participate with informed consent. Exclusion criteria included not consenting to participate, not being a resident in emergency or surgical programs, submitting incomplete survey responses, and being outside the age range typically associated with medical residency programs.

This study was approved by the research ethics committee of King Faisal University's Deanship of Scietific Research, Al Hofuf, Saudi Arabia (reference No.: KFU-REC-2024-JAN-ETHICS1984). Ethical considerations were paramount, with adherence to guidelines, approval from the institutional review board, and informed consent obtained from all participants. Measures were implemented to ensure the privacy and confidentiality of the collected data.

The questionnaire included sections on demographics, job-related questions, health-related questions, the MBI-HSS, and the RS-14. The MBI-HSS, a 22-item questionnaire, assessed burnout using 3 subscales: EE, DP, and personal accomplishment (PA). Participants were categorized of having high, moderate, or low of each MBI-HSS dimension as follow: EE of >27 (high), EE of 19-26 (moderate), EE of 0-18 (low), DP of >10 (high), DP of 6-9 (moderate), DP of 0-5 (low), and PA of >40 (high), PA of 34-39 (moderate), PA of 0-33 (low). Burnout was determined by the presence of one or more of the following: high EE, high DP, or low PA scores. The RS-14, a 14-item questionnaire with a 7-point Likert scale with range of 1-7 for each item with total scores ranging from 14-98. Scores lower than 65 indicate low resilience, scores from 65-81 are considered moderate resilience, while scores above 81 indicate high resilience. The internal reliability of both MBI-HSS and RS-14 was confirmed through Cronbach's alpha coefficients with internal consistency of RS-14 which was good (Cronbach's α=0.90).[17] The reliability coefficients' ranges of the MBI are: Cronbach Alpha = 0.71-0.90 and one month test-retest = 0.60-0.80.[18]

Data was collected using an online survey platform, distributed via institutional channels and professional networks. Participants were assured of confidentiality, and responses were anonymized. The survey remained open for a predetermined period, after which data were extracted for analysis.

Statistical analysis. Quantitative data analysis involved descriptive statistics for demographic and health-related variables. Data analysis were carried out using the Statistical Package for the Social Sciences, version 26.0 (IBM Corp., Armonk, NY, USA). Burnout and resilience levels were assessed using the MBI-HSS and RS-14. Frequency and percentages (%) were given for description of categorical variables while mean and standard deviation (SD) were used of ongoing variables. The independent sample t-test and ANOVA test were used to assess the difference between RS-14 means and different demographic groups. Moreover, Chi-test was used to assess the difference between demographic factors considering the prevalence of burnout. Type I error rate was 0.05. *P*-values of <0.05 were considered significant.

Results. A total of 367 emergency and surgical residents completed the quiestionaire. The participants were distributed across various age groups, with the largest percentage (26.7%) falling in the >30 age category. Most participants were male (72.2%), single (53.4%), and without children (59.9%). The study included a nearly equal representation of emergency residents (48.5%) and surgical residents (51.5%). Participant distribution varied in terms of length of experience, with the majority having more than one year of experience (51.3%). Additionally, there was diverse representation among participants enrolled in postgraduate programs. Table 1 displays the demographic characteristics of the participants.

Table 2 presents the health characteristics of the participants. The majority of participants rated their general health as good (43.1%). The frequency of depressed feelings varied among the participants, with occasional feelings being the most common (34.9%). Regarding exercise habits, a substantial portion of participants exercised occasionally (45.8%) or frequently (14.4%). Dietary habits showed that a significant proportion of participants occasionally (36.8%) or frequently (34.6%) consumed fast food. The participants reported diverse sleeping patterns, with a substantial number rating their sleep as good (37.6%).

Table 3 outlines the prevalence of burnout among participants as measured by the MBI-HSS. Emotional exhaustion, DP, and lack of PA were categorized into low, moderate, and high tiers. The majority of participants experienced high EE (54.8%), while a significant portion reported high levels of DP (27.8%) and lack of PA (54.0%). According to the criterion of burnout, the overall burnout prevalence was 62.7%.

Table 1 - Demographic characteristics of the participants (N=367).

Variables	n (%)
Age (years)	
22-25	98 (26.7)
26-28	103 (28.1)
29-30	68 (18.5)
>30	98 (26.7)
Gender	
Male	265 (72.2)
Female	102 (27.8)
Marital status	
Single	199 (54.2)
Married	168 (45.8)
Do you have children?	
Yes	147 (40.1)
No	220 (59.9)
Specialty	
Emergency resident	178 (48.5)
Surgical resident	189 (51.5)
Length of experience	
<6 months	126 (34.3)
6 months - one year	53 (14.4)
>1 year	188 (51.3)
Are you enrolled in an emergency medicine postgraduate program?	
Yes	53 (29.8)
No	125 (70.2)
Are you enrolled in a surgical postgraduate program?	
Yes	49 (25.9)
No	140 (74.1)

Values are presented as numbers and percentages (%).

Table 2 - Health characteristics of the participants (N=367).

Variables	n (%)
General health perception	
Excellent	98 (26.7)
Very good	86 (23.4)
Good	158 (43.1)
Fair	23 (6.3)
Poor	2 (0.5)
Frequency of depressed feelings	
Never	53 (14.4)
Rarely	96 (26.2)
Occasionally	128 (34.9)
Frequently	59 (16.1)
Always	31 (8.4)
Exercise frequency	
Never	32 (8.7)
Rarely	49 (13.4)
Occasionally	168 (45.8)
Frequently	53 (14.4)
Always	65 (17.7)
Consuming fast food	
Never	26 (7.1)
Rarely	46 (12.5)
Occasionally	135 (36.8)
Frequently	127 (34.6)
Always	33 (9.0)
Describe your sleeping pattern	
Excellent	67 (18.3)
Very good	98 (26.7)
Good	138 (37.6)
Fair	35 (9.5)
Poor	29 (7.9)

Values are presented as numbers and percentages (%).

Table 4 provides an in-depth analysis revealing the complex relationships between burnout prevalence, demographic factors, and RS-14 scores among emergency and surgical residents. No significant differences in burnout prevalence were observed across age groups, with mean RS-14 scores ranging from 61.1-65.1. However, gender emerged as a significant factor, with female participants experiencing a higher burnout rate (70.6%) and a lower mean RS-14 score (54.1%) compared to males (59.6%, mean RS-14=72.1%). Marital status also displayed a notable impact, with single participants reporting higher burnout rates (65.8%) than their married counterparts (58.3%) and married individuals having a notably higher mean RS-14 score (76.1%). The presence of children demonstrated a significant association with burnout (p=0.000), as participants with children reported higher burnout rates (71.4%) and a substantially higher mean RS-14 score (78.2%). Differences between specialties were marked, with emergency residents experiencing a higher burnout rate (70.8%) and a lower RS-14 mean score (50.9%) compared to surgical residents (55.0%, mean RS-14=75.3%). Length of experience showed a significant association with burnout (p=0.003), with those having less than 6 months of experience exhibiting higher burnout rates (86.5%) and a lower mean RS-14 score (65.2%).

Enrollment in postgraduate programs also revealed significant associations with burnout rates. Emergency medicine postgraduate participants exhibited higher burnout rates (60.4%), while those enrolled in surgical postgraduate programs experienced lower burnout rates (38.8%). Correspondingly, mean RS-14 scores mirrored these differences, with higher scores observed among surgical postgraduate participants (75.3%).

Discussion. Burnout among emergency and surgical residents is a critical issue that warrants attention due to its potential impact on individual well-being and patient care.[1,19] This study's findings provide valuable insights into the demographic factors, health characteristics, burnout prevalence, and resilience among this specific cohort of medical professionals in Saudi Arabia.

Table 3 - The prevalence of burnout and burnout subscales among the participants (N=367).

Variables	n (%)
Emotional exhaustion	
Low	76 (20.7)
Moderate	90 (24.5)
High	201 (54.8)
Depersonalization	
Low	167 (45.5)
Moderate	98 (26.7)
High	102 (27.8)
Lack of personal accomplishment	
Low	83 (22.6)
Moderate	86 (23.4)
High	198 (54.0)
Burnout prevalence (high levels of either EE or DP)	
Burnout	230 (62.7)
Non-burnout	137 (37.3)

Values are presented as numbers and percentages (%).
EE: emotional exhaustion, DP: depersonalization

Frequent stressful environments can negatively impact lifestyle and quality of life. Except for 14% of participants, the rest reported experiencing depressed feelings with varying frequency. A predominant reliance on fast food was observed, ranging from occasional to always. Although this dietary habit is concerning due to potential health problems, it may also increase stress levels.[20,21] On the other hand, exercise and sleeping patterns appear reassuring. Good sleep and frequent exercise support mental and physical wellness, which may positively impact the ability to cope with stressful situations.[22]

In our study, as assessed through the MBI-HSS, the overall prevalence of burnout was 63%. More than half of the participants (55%) experienced high EE, while a significant proportion reported high DP (28%) and a lack of PA (23%). These findings align with both regional and global trends among medical residents, emphasizing the need for targeted interventions.[23-29]

Although the targeted healthcare workers may vary, research on this issue consistently yields concerning results. Alenezi et al[23] explored burnout prevalence among Saudi residents of various speciality. They reported findings that were almost comparable to ours regarding burnout subscales. Doraiswamy et al[26] carried out a systematic review in the Eastern Mediterranean region, finding high prevalence rates for EE, DP, and low PA. Benhamza et al[30] noted a significant prevalence of burnout among intensive care physicians, with 48% experiencing high EE, 43.2% displaying significant DP, and 21% exhibiting a low sense of PA. Medeiros et al[31] surveyed healthcare workers and found high EE in 48.6% of participants and high DP in 29.4%. Shroub et al[32] observed that 57.7% of participants experienced high EE, 21.5% had high DP, and 47.8% reported a lack of PA.

The RS-14 scores indicated variations in resilience levels among participants. Being male, married, having children, and being enrolled in a postgraduate program were associated with higher resilience scores. Emergency residents had significantly lower resilience scores compared to surgical residents, which may reflect the unique stressors associated with emergency medicine. The negative correlation between resilience and burnout is consistent with previous research, emphasizing the potential protective role of resilience in mitigating burnout.[33-35]

The analysis of demographic factors in relation to burnout revealed noteworthy associations. Female participants exhibited higher burnout rates than males, aligning with previous literature highlighting gender disparities in burnout.[26,27,29-31] The impact of marital status on burnout was consistent with a previous study carried out in Saudi Arabia, where married residents reported significantly lower burnout rates than single residents.[23] This finding could be explained by the support and emotional relief provided by a partner. However, this finding contradicts other studies that identify marriage as a contributing factor to burnout.[36,37] Chen et al[36] studied the correlation between marriage and burnout among healthcare workers during the coronavirus disease 2019 pandemic, although isolation protocols and fear of disease transmission may have influenced the results. Nevertheless, the burnout prevalence among married participants in our study remains high at 58%, underscoring the need for family-friendly policies and support systems within residency programs. Specialty-based variations in burnout prevalence highlight the distinct challenges faced by emergency residents, necessitating targeted interventions for this subgroup. Residents' burnout decreased by half after one year of experience, a finding consistent with numerous studies demonstrating the positive impact of experience on reducing burnout.[37] This emphasizes the importance of early and targeted interventions. Notably, enrollment in postgraduate programs significantly reduces burnout, possibly due to structured task descriptions, and an improved sense of accomplishment among enrolled residents.

The study findings have important implications for developing targeted interventions to address burnout among emergency and surgical residents. Implementing resilience-building programs, mental health support services, and fostering a supportive work environment

Table 4 - The relationship between burnout and demographic factors.

Variables	Burnout	Non-Burnout	*P*-values	RS-14	
				Mean	*P*-values
Age (years)					
22-25	61 (62.2)	37 (37.8)	0.638	64.2	0.4
26-28	64 (62.1)	39 (37.9)		62.1	
29-30	43 (63.2)	25 (36.8)		65.1	
>30	62 (63.3)	36 (36.7)		61.1	
Gender					
Male	158 (59.6)	107 (40.4)	<0.001*	72.1	<0.001*
Female	72 (70.6)	30 (29.4)		54.1	
Marital status					
Single	132 (65.8)	67 (34.2)	0.030*	59.9	<0.001*
Married	98 (58.3)	70 (41.7)		76.1	
Do you have children?					
Yes	105 (71.4)	42 (28.6)	<0.001*	78.2	<0.001*
No	125 (56.8)	95 (43.2)		47.9	
Specialty					
Emergency resident	126 (70.8)	52 (29.2)	<0.001*	50.9	<0.001*
Surgical resident	104 (55.0)	85 (45.0)		75.3	
Length of experience					
<6 months	109 (86.5)	17 (13.5)	0.003*	65.2	<0.001*
6 months - one year	41 (77.4)	12 (22.6)		58.7	
>1 year	80 (42.6)	108 (57.4)		65.3	
Are you enrolled in an emergency medicine postgraduate program?					
Yes	32 (60.4)	21 (39.6)	<0.001*	70.3	<0.001*
No	94 (75.2)	31 (24.8)		55.9	
Are you enrolled in a surgical postgraduate program?					
Yes	19 (38.8)	30 (61.2)	<0.001*	75.3	<0.001*
No	85 (60.7)	55 (39.3)		50.9	

Values are presented as numbers and percentages (%). *Significant, RS-14: resilience scale-14

are crucial steps. Family-friendly policies and mentorship programs could help alleviate stress associated with marital status and parenthood. Additionally, the gender disparities in burnout call for further exploration and tailored solutions to determine the unique challenges faced by female residents.

Study limitations. While this study provides useful insights, it is fundemental to acknowledge certain limitations. The cross-sectional design limits the capability to draw causal inferences, and the self-report nature of the survey could introduce potential response bias. Longitudinal designs and including objective measures are advised in future research to enhance the robustness of the findings. Additionally, exploring cultural factors specific to Saudi Arabia could provide a deeper understanding of burnout within this context.

In conclusion, this study sheds light on the multifaceted aspects of burnout among emergency and surgery residents in Saudi Arabia. The findings underscore the need for comprehensive interventions targeting both individual and organizational factors. Addressing demographic-specific challenges and promoting resilience may contribute to the well-being of residents, ultimately enhancing the quality of patient care.

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