

ORIGINAL ARTICLE

Assessment of burnout among emergency medicine residents in Saudi Arabia: a cross-sectional survey

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ABSTRACT

Background: Burnout syndrome is a frequent challenge faced in the emergency department. There exists a dearth of clinical evidence regarding the risk and occurrence of burnout, among emergency residents in Saudi Arabia. Therefore, this study was conducted to assess the parameters of burnout in this cohort.

Methods: This prospective, cross-sectional study was conducted via an online survey using the Maslach Burnout Inventory - Human Services Survey (MBI-HSS) for Healthcare Professionals questionnaire. All emergency medicine residents registered under the country's residency program were invited to participate. The relative importance index analysis was used to describe the frequency of the MBI-HSS indicators. The t-test of independent groups and the one-way analysis of variance were used to assess the impact of demographic and professional factors.

Results: A total of 73 residents completed the questionnaire. Low personal accomplishment (PA) was reported by 53.4% while medium to high depersonalization (DP) and emotional exhaustion (EE) were reported by 84.9% and 67.1% of residents, respectively. Female residents had significantly higher EE versus males. Age, marital status, and number of children had no correlation with burnout. Emergency residents serving at hospitals of the Ministry of Health reported significantly higher levels of burnout, versus other institutions. The final year of the residency program showed significantly lower levels of burnout than the earlier years.

Conclusion: This is the first study from Saudi Arabia, to assess the parameters of burnout, specifically among emergency medicine residents. The study has shown alarmingly high levels of DP, EE, and low PA and warrants urgent remedial measures to curb burnout among emergency residents.

Keywords: Burnout, emergency residents, depersonalization, emotional exhaustion, low personal accomplishment.

Introduction

The word "burnout" paints a grim picture of an individual who is emotionally and physically drained out, feels detached from people and cynical about the surrounding environment, has a poor sense of accomplishment, has low job satisfaction, and suffers from psychological and physical stress. Burnout is a well-known occupational hazard and a growing menace that needs urgent attention [1].

Medical professionals are highly vulnerable to burnout syndrome due to exceptionally high stress levels and the mounting pressures of medical practice. Past research has demonstrated that the global prevalence of burnout among doctors ranges from 12% to as high as 81% [2]. There are multiple factors associated with rampant burnout among physicians including increasing workload, longer work hours, erratic schedules, lack of

personal time, night shifts, poor workplace environment, lack of support from colleagues and subordinates, rising demands from seniors, undue pressure from patients' families, and the pressure to save lives and improve prognosis in spite of unfavorable circumstances. All

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these factors work together and take a heavy toll on the psychological, emotional, and physical well-being of healthcare professionals in emergency medicine. This can trigger episodes of emotional turbulence, suicidal tendencies, and chronic systemic disorders. All these accumulations cause a direct adverse impact on the quality of medical care delivered to patients [2].

Amidst the chaos of emergency medical services, a doctor struggles with the negative feelings of emotional exhaustion (EE), depersonalization (DP), and low personal accomplishment (PA). These three parameters comprise the standardized yardstick for measuring the levels of burnout in an individual. PA, DP, and EE constitute the key components of the Maslach Burnout Inventory - Human Services Survey (MBI-HSS) index; a widely accepted and adopted scale for burnout assessment [2,3].

Within the spectrum of medical professionals, it is the resident doctors who fall prey to burnout most often. Past evidence tells us that up to 88% of resident doctors suffer from burnout at some point in time during their residency, regardless of the medical specialty they belong to [4]. Among the emergency medicine team, the rates of burnout are known to be significantly high among resident doctors in the emergency department (ED) [5,6]. The prevalence of burnout was found to be nearly 76%, in a large cohort of 1,522 emergency residents in the United States (US), equivalent to a sample of >20% of all US emergency residents [7]. A large, multicountry survey conducted by the European Society of Emergency Medicine revealed that 62% of emergency medical workers suffer from symptoms of burnout [8]. In a cohort of 200 emergency residents from India, Dolly and Radhika [9] reported an alarmingly high burnout rate of 90.9%, with severe burnout reported in 37.1% of residents.

Global data reveals that the prevalence of burnout among post-graduate medical trainees is 67.4% in the Middle East, which is significantly higher than that reported in the US, Europe, or other Asian countries [4]. However, Saudi Arabia faces a lack of large-scale country-specific data on this issue. However, the published literature does have individual studies from Saudi Arabia with varying estimates of the rate of burnout, among physicians and residents from nonemergent medical specialties [10-13]. Some research studies have also published clinical data regarding burnout among emergency care physicians in Saudi Arabia [1,14,15]. However, to the best of our knowledge, there is a severe and long-standing dearth of data, regarding the rates of burnout among emergency medicine residents in the country, who are perhaps one of the most vulnerable subgroups for burnout. Therefore, we conducted this questionnaire-based study among a group of registered emergency medicine residents in the country, to throw light on the magnitude of burnout and its causative factors, in this sensitive cohort.

Materials and Methods

This prospective, cross-sectional study was conducted via an online questionnaire-based survey (MBI-HSS questionnaire), focused on the key parameters (EE, DP, and PA) of the MBI-HSS for burnout assessment.

Formal permission was obtained to utilize the English and Arabic versions of the survey questionnaire through the official website of Maslach's Inventory. The survey questionnaire was made available to the participants through the Survey Monkey portal.

All emergency medicine residents (Level R1 to R4) registered under the residency program of the Saudi Commission for Health Specialty (SCFHS) were eligible to participate in this survey, unregistered residents were excluded. An online link to the survey questionnaire along with a participation request was sent to each of the registered residents. The study was conducted from September 1st, 2018 to Jan 1st, 2019 and was approved by the research ethics committee at King Abdul Aziz University Hospital.

Means and SDs were used to describe continuous variables. Frequencies and percentages were employed for the description of categorical variables.

The relative importance index (RII) analysis was used to describe the relative frequency of the MBI-HSS indicators. The RII is a weighted average of the residents' responses to each indicator. It was used to weigh the residents' perceptions in terms of their sheer magnitude.

The RII is a weighted average of the total responses of residents to each item on the MBI-HSS, expressed as a percentage between 0% and 100%. Values of RII have the following interpretations with respect to the indicators of burnout:

- 0%–25% – ηιγηλψ νονσυβσταντιωε
- 25%–50% – νονσυβσταντιωε
- 50%–75% – συβσταντιωε
- >75% – ηιγηλψ συβσταντιωε

The t-test of independent groups and the one-way analysis of variance were used to assess the emergency residents' demographic and professional factors, for statistically significant differences in their mean perceptions of each of the three main domains (EE, DP, and PA) of the MBI-HSS questionnaire. The Statistical Package for the Social Sciences IBM Version-20 and Microsoft Excel programs were used to collect and analyze the data. p-value less than 0.050 was considered significant.

Results

A total of 113 SCFHS-registered emergency medicine residents were invited to participate in the online MBI-HS survey. Of these, 73 residents responded to the survey and completed the questionnaire. Table 1 summarizes the demographic and professional characteristics of the survey respondents. The majority of respondents were males (61.6%), below 28 years of age (67.1%), single (64.4%), and the majority of them did not have any children (82.2%). Most respondents (68.5%) were from training levels R1 and R2.

Table 2 summarizes the descriptive statistics and RII values for the three key subscales of PA, DP, and EE. Each item or response on these subscales was evaluated with a mean, SD, and most importantly an RII value.

On the PA subscale, residents expressed confidence and positivity about being able to effectively deal with

Table 1. Emergency residents' demographic and professional characteristics (N = 73).

Variable	Frequency (%)
Gender	
Male	45 (61.6)
Female	28 (38.4)
Age (years)	28.20 ± 3.8
24-28 years	49 (67.1)
>28 years	24 (32.9)
Marital status	
Single	47 (64.4)
Married	26 (35.6)
Children	
No	60 (82.2)
Yes	13 (17.8)
City	
East provinces	17 (23.3)
Middle region	25 (34.2)
West provinces	31 (42.5)
Training level	
Resident-1	31 (42.5)
Resident-2	19 (26.0)
Resident-3	15 (20.5)
Resident-4	8 (11.0)
Medical training location	
National Guard	17 (23.3)
King Faisal Specialist Hospital	12 (16.4)
University Hospital	24 (32.9)
Other ^a	9 (12.3)
MOH hospitals	11 (15.1)

^aMOH - Ministry of Health; Other hospitals include: Two from the Royal Commission of Jubail, two from Security Forces' Hospitals, one from the Royal Commission of Yanbu, and four from other undisclosed hospitals.

patients' problems (RII = 79%). Residents opined that they could easily understand patients' feelings (RII = 76.7%) and could create a relaxed environment for patients to cope up with their issues (RII = 69.2%). On the PA subscale, the RII values were the lowest with respect to residents feeling exhilarated after working closely with patients (RII = 57.3%) and having a sense of worthwhile accomplishment (RII = 59.6%).

On the DP subscale, the top three concerns were as follows: residents seemed worried that their job in emergency medicine is making them emotionally insensitive (RII = 50.2%), they seemed cognizant of the feeling that they have become callous toward people (RII = 39.5%) and were concerned that they get unduly blamed for patients' problems (RII = 37%).

Finally, on the EE subscale, the three most substantive triggers of emotional turbulence were that the job of a resident demands excessive hard work (RII = 66.9%), they feel drained out by the end of the day (RII = 58.7%) and fatigued the next morning making it tough to gear up for the next workday (RII = 58%). This was followed by some residents also reporting a feeling of burnout, emotional drainage, and job frustration.

Table 3 classifies the levels of PA, DP, and EE reported by the study participants, into degrees of intensity - low, medium, and high. A significantly higher number of

Table 2. Descriptive statistics and RII values of MBI-HSS indicators of burnout among emergency residents (N=73).

Indicators	Mean	SD	RII	Rank
PA at work subscale				
I can easily understand how my patients feel about things.	4.6	1.61	76.7	2
I deal very effectively with the problems of my patients.	4.74	1.35	79.0	1
I feel I am positively influencing other people's lives through my work.	3.92	1.89	65.3	5
I feel very energetic.	3.99	1.75	66.4	4
I can easily create a relaxed atmosphere with my patients.	4.15	1.75	69.2	3
I feel exhilarated after working closely with my patients.	3.44	2.07	57.3	8
I have accomplished many worthwhile things in this job.	3.58	1.85	59.6	7
In my work, I deal with emotional problems very calmly.	3.9	1.69	65.1	6
DP subscale				
I feel I treat some patients as if they were impersonal objects.	2.1	1.92	34.9	4
I have become more callous toward people since I took this job.	2.37	2	39.5	2
I worry that this job is hardening me emotionally.	3.01	2.04	50.2	1
I do not really care what happens to some patients.	1.07	1.7	17.8	5
I feel patients blame me for some of their problems.	2.22	2.11	37.0	3
EE subscale				
I feel emotionally drained from my work.	2.85	1.96	47.5	5
Working with people all day is really a strain for me.	2.18	2.03	36.3	8
I feel burned out from my work.	2.9	2.04	48.4	4
I feel frustrated by my job.	2.74	1.94	45.7	6
I feel I am working too hard on my job.	4.01	1.78	66.9	1
Working with people directly puts too much stress on me.	2.36	1.97	39.3	7
I feel like I am at the end of my rope.	2.08	2.13	34.7	9
I feel used up at the end of the workday.	3.52	1.99	58.7	2
I feel fatigued when I get up in the morning and have to face another day on the job.	3.48	2.03	58.0	3

MBI-HSS - Maslach Burnout Inventory - Human Services Survey; RII - Relative importance index; SD - standard deviation.

residents reported a low level of PA (53.4%; $p = 0.001$) coupled with medium to high levels of DP (84.9%; $p = 0.01$), and EE (67.1%; $p = 0.001$). The mean percentage of respondents with low PA, medium to high DP, and EE was 68.4% in our study.

Figure 1 summarizes the percentage of emergency residents with low PA and average to high DP and EE. This subgroup signifies the residents facing a notable degree of burnout.

Table 4 given below correlates the residents' demographic and professional characteristics with their level of PA. Residents >28 years of age had significantly greater PA than those aged <28 years ($p = 0.029$). No other factors exerted a statistically significant impact on PA levels (Table 4).

Significantly higher levels of EE were reported by female emergency residents versus their male counterparts ($p = 0.006$) (Table 5). As the residency program progressed from its first year to the third year, a rise in the level of EE was reported, followed by a lower EE in the final year ($p < 0.001$). The first-year and second-year residents reported a mean EE level of 25.39 and 18.58, respectively. A sharp rise was seen in the third year with mean EE escalating to its highest score of 38.2, followed by a substantial fall of the EE level, to a mean score of 24.25 in the fourth year of residency. The levels of EE also differed significantly based on the location of the residency program. Residents from hospitals under the

Ministry of Health (MOH), in Saudi Arabia, reported the highest mean EE score of 33.1. Coming close to this level, were the residents from the King Faisal Specialist Hospital and the National Guard with mean EE scores of 30 and 30.17, respectively. Residents at the university-based teaching hospitals reported the lowest mean EE score of 17.83.

Table 6 correlates residents' level of DP with their demographic factors. Residents from various Saudi provinces differed significantly with respect to their sense of DP ($p = 0.025$); those from eastern provinces had a significantly lower mean perceived DP, versus the western provinces ($p = 0.026$) (Table 6).

The DP-related results followed a trend and pattern similar to EE, with respect to the year and location of residency. As the residency program progressed from its first year to the third year, a rise in the level of DP was reported, followed by lower DP in the final year ($p = 0.004$). The first-year and second-year residents reported a mean DP level of 10.32 and 8.95, respectively. A sharp rise was seen in the third year with the mean DP escalating to 16, followed by an almost equal fall of the DP level, to the lowest mean score of seven in the fourth year of residency. The levels of DP also differed significantly based on the location of the residency program. Residents from hospitals under the MoH, in Saudi Arabia, reported the highest mean DP score of 15.45. Coming close to this level, were the residents from the King Faisal Specialist Hospital and the National Guard with mean DP scores

Table 3. Burnout parameters classified as per intensity (N = 73).

Burnout parameter	n (%)			p-value*
	Low	Medium	High	
PA level	39 (53.4%)	17 (23.3%)	17 (23.3%)	0.001
DP level	11 (15.1%)	25 (34.2%)	37 (50.7%)	0.011
EE level	24 (32.9%)	14 (19.2%)	35 (47.9%)	0.001

p-value calculated as per chi-square test.

DP - Depersonalization; EE - emotional exhaustion; SD - standard deviation.

*Significant p value.

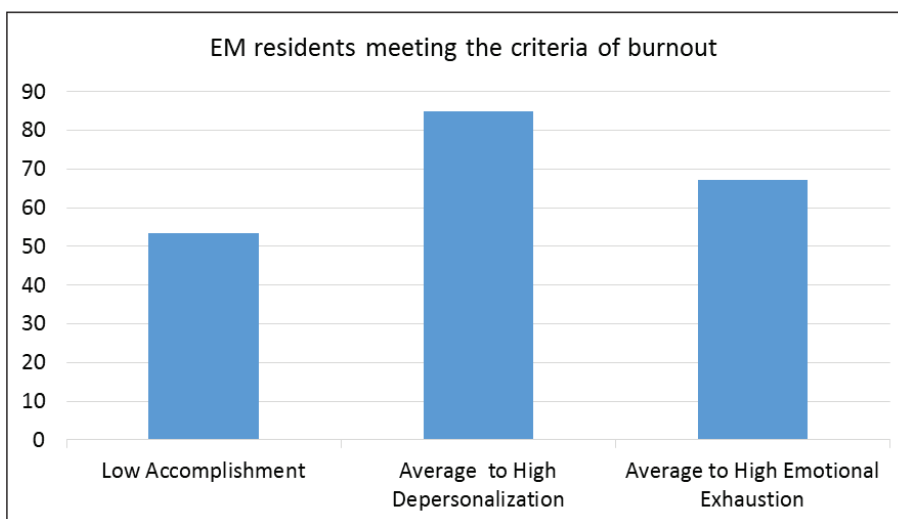


Figure 1. Percentage of emergency residents facing burnout. EM - Emergency medicine residents.

Table 4. Bivariate analysis of the emergency medicine residents' PA across demographic and professional characteristics (N = 73).

Variable	Mean (SD)	p-value*
Gender		
Male	33.27 (8.85)	0.242
Female	30.78 (8.53)	
Age (years)		
24-28 years	30.76 (9.15)	0.029
>28 years	35.5 (7)	
Marital status		
Single	31.32 (9.72)	0.145
Married	34.12 (6.43)	
Children		
No	32 (9.10)	0.513
Yes	33.77 (7.05)	
City		
East provinces	32.94 (6.37)	0.34
Middle region	34 (9.34)	
West provinces	30.61 (9.31)	
Training level		
Resident-1	32.26 (10.7)	0.886
Resident-2	31.79 (5.9)	
Resident-3	31.87 (8.24)	
Resident-4	34.63 (7.86)	
Medical training location		
National Guard	31.11 (8.2)	0.12
King Faisal Specialist Hospital	28.17 (7.7)	
University Hospital	35.92 (9.5)	
Other ^a	31.56 (8.5)	
MOH hospitals	31.45 (7.5)	

^aOther hospitals include: Two from the Royal Commission of Jubail, two from Security Forces' Hospitals, one from the Royal Commission of Yanbu, and four from other undisclosed hospitals; p-value calculated as per independent samples t-test.

MOH - Ministry of Health; SD - Standard deviation.

*Significant p value.

Table 5. Bivariate analysis of the emergency medicine residents' perceived EE across demographic and professional characteristics (N = 73).

Variable	Mean (SD)	p-value
Gender		
Male	22.58 (13.5)	0.006
Female	31.82 (13.8)	
Age (years)		
24-28 years	26.27 (14.5)	0.904
> 28 years	25.83 (13.9)	
Marital status		
Single	27.45 (15.2)	0.288
Married	23.73 (12.3)	
Children		
No	25.83 (14.5)	0.711
Yes	27.50 (13.2)	
City		
East provinces	21.24 (12.97)	0.264
Middle region	28.16 (15.96)	
West provinces	27.16 (13.2)	
Training level		
Resident-1	25.39 (13.73)	<0.001
Resident-2	18.58 (11.1)	
Resident-3	38.2 (12.11)	
Resident-4	24.25 (13.84)	
Medical training location		
National Guard	30 (13.81)	0.008
King Faisal Specialist Hospital	30.17 (14)	
University Hospital	17.83 (13.2)	
Other ^a	27 (12.7)	
MOH hospitals	33.1 (11.9)	

^aOther hospitals include: Two from the Royal Commission of Jubail, two from Security Forces' Hospitals, one from the Royal Commission of Yanbu, and four from other undisclosed hospitals; p-value calculated as per independent samples t-test.

EE - Emotional exhaustion; MOH - Ministry of Health; SD - Standard deviation

Table 6. Bivariate analysis of the emergency medicine residents' perceived DP across demographic and professional characteristics (N = 73).

Variable	Mean (SD)	p-value
Gender		
Male	9.96 (6.74)	0.205
Female	12.10 (7.1)	
Age (years)		
24-28 years	11.10 (7.1)	0.606
>28 years	10.17 (6.6)	
Marital status		
Single	10.77 (7.2)	0.998
Married	10.76 (6.5)	
Children		
No	10.78 (7)	0.966
Yes	10.69 (7)	
City		
East provinces	7.82 (4.1)	0.025
Middle region	11.48 (8.81)	
West provinces	11.81 (6.04)	
Training level		
Resident-1	10.32 (7)	0.004
Resident-2	8.95 (4.70)	
Resident-3	16 (7.3)	
Resident-4	7 (5.39)	
Medical training location		
National Guard	12.35 (7.7)	0.003
King Faisal Specialist Hospital	13 (6.65)	
University Hospital	7.13 (4.9)	
Other ^a	8.78 (3.5)	
MOH hospitals	15.45 (8)	

^aOther hospitals include: Two from the Royal Commission of Jubail, two from Security Forces' Hospitals, one from the Royal Commission of Yanbu, and four from other undisclosed hospitals; p-value calculated as per independent samples t-test.

DP - Depersonalization; MOH - Ministry of Health; SD - Standard deviation.

of 13 and 12.35, respectively. Residents at the university hospitals reported the lowest levels of DP.

Discussion

Our study has revealed an alarming pattern of burnout among emergency residents, with the majority of them reporting low PA and medium to high levels of DP and EE. Our sample included 61.6% males and 38.4% females. In this study, the PA levels were comparable across both genders. However, females had a significantly higher level of EE as compared to males. The DP levels were also higher among females in our study though the difference was not significant. This leads us to infer that female emergency residents in our study seemed more vulnerable to burnout than males. A similar finding has been put forward by past studies too, indicating greater levels of burnout among female emergency professionals [16-19].

In our study, we found a nonsignificant increase in PA among residents >28 years of age versus the younger age group of 24-28 years. Age also did not seem to impact the levels of DP or EE, which were found to be comparable in both age groups. However, past studies have presented a mixed opinion regarding the impact of age on burnout. Kimo Takayesu et al. [20] found no correlation between age and burnout in a cohort of 218 emergency medicine residents. Several other studies have presented similar findings showing no major impact

of age on the parameters of burnout [21]. On the other hand, a cross-sectional survey among 111 emergency physicians conducted by Lovell et al. [22] showed that the DP levels declined significantly with advancing age. A similar finding has also been put forth by Lu et al. [23] in a self-reported survey assessing the impact of burnout on emergency physicians. Jalili et al. [24] have also demonstrated an inverse correlation between DP and age, among Iranian emergency physicians. Alqahtani et al. [14] have reported significantly higher levels of EE among emergency physicians in Saudi Arabia, aged 31-35 years versus their younger counterparts aged 25-30. In a cohort of Turkish emergency residents, Toker et al. [25] confirmed that the younger the age, the higher the DP and EE. In a Palestinian cohort of emergency healthcare workers too, younger age was reported as a key factor for increasing burnout rates [26].

The marital status of residents or the number of children did not impact any of the burnout parameters in our study; a finding that seems in congruence with several past studies [14,22,27-29]. However, we also found contrasting evidence from past studies showing the impact of marital status and children on the level of burnout among emergency residents. Kimo Takayesu et al. [20] demonstrated that emergency residents who had a significant other or spouse had a higher prevalence of burnout compared to single residents (60% vs. 40%, $p = 0.002$) [20]. A national survey from the US showed that being a parent can significantly reduce burnout among emergency residents [30]. In a cohort of 488 emergency residents, Whitley et al. [31] showed that unmarried residents had significantly higher stress and depression levels as compared to their married counterparts. In our opinion, the evidence on this aspect of burnout is divergent, presenting a mixed opinion. Hence, future studies should be conducted to ascertain the impact of marriage and children on emergency residents' burnout levels. We concur with Kalemoglu and Keskin [32] that sharing everyday issues and problems with close family and friends can help reduce the risk of burnout among emergency residents.

We analyzed the levels of PA, EE, and DP in our sample, based on the location of the emergency residents. In our study, emergency medicine residents from the middle, western, and eastern provinces of Saudi Arabia had comparable levels of PA. Residents from the eastern province had significantly lower levels of DP versus their middle and western province counterparts. EE also followed the same pattern with notably lower levels in the eastern province versus the other two provinces, though the difference was not statistically significant. We believe geographical factors or the city of residence may have an impact on the levels of burnout. Past studies have demonstrated varying levels of burnout among emergency residents in different countries and geographical locations [22,33].

We analyzed the parameters of burnout among emergency residents, across different types of hospitals in the country. Residents at hospitals of the MoH had the highest levels of DP and EE, followed by those at King Faisal Hospital and the National Guard. In comparison to this, significantly lower DP and EE scores were noted

among the residents at the university teaching hospitals. We believe a lot of organizational and workplace-related factors account for such a notable difference in the DP and EE levels across these institutions. The organizational culture, workplace environment, overall workload, stress levels, and work pressures are known to impact the parameters of burnout among emergency residents [2].

We report a peculiar pattern in the dynamics of DP and EE, across the different years of the residency program. DP and EE levels were at a steady high during the first and second years of residency, with a further steep rise seen in the third year. In sharp contrast to this, an equally steep decline in DP and EE was seen in the final year. We believe this early rise and late fall of DP and EE during the residency years signifies the higher levels of burnout faced by younger emergency residents as compared to their final-year peers. In our view, the most plausible explanation of this phenomenon is that residents in their final year are better equipped to handle the stresses of the ED, through their experiences and practice of the earlier years of residency. Past studies have presented divergent views on the association of burnout with the year of residency in the ED. In a cohort of 173 emergency medicine residents, Dam et al. [34] have shown a burnout pattern similar to our study, with the incidence of burnout peaking in the third year of residency (87.3%) followed by a sharp reduction in the fourth year (63%). The DP and EE levels in this study also followed a trend similar to that seen in our study, with levels rising in the second and third years and plummeting significantly in the final year [34]. In contrast to this, a national survey conducted in a cohort of 247 emergency residents from the US showed the level of burnout to be 75% among first-year residents whereas residents in their third and final year reported higher burnout in the range of 83%–85% [7]. Vanyo et al. [35] examined the burnout levels among 2,501 first-year residents, 2,389 second-year residents, 2,206 third-year, and 616 final-year emergency residents. In this large cohort, a steady rise in burnout levels was reported from the first to the fourth year, escalating from 28.2% to 43.3%, respectively [35]. Williams et al. [36] assessed burnout levels in a group of forty military emergency residents in the US and reported that 60% of residents suffered from burnout in the first year whereas a cent percent burnout rate was reported for final year emergency residents.

To the best of our knowledge, this is the first study from Saudi Arabia, to assess the prevalence of burnout, specifically among emergency medicine residents, in a cross-sectional country-wide sample. The study provides insight and a glimpse into the magnitude and scale of “burnout” as a highly prevalent syndrome among emergency residents in Saudi Arabia. The situation warrants urgent remedial measures to reduce and better streamline the workload in the ED, to provide a better work culture and environment at the workplace for residents, and to help boost their self-confidence and self-esteem at work.

Optimizing staff recruitment in the ED, better scheduling of work hours and shifts, ensuring circadian scheduling as far as possible, minimizing diurnal switches in

scheduling, employing medical scribes, using cutting-edge technology to support clinical management and better time utilization can all play a significant role in reducing burnout among emergency residents [37].

It is also essential to reward the excellent clinical achievement of residents and acknowledge their efforts. It is necessary to make residents feel more autonomous and in control of their medical decisions and time in the ED. Improving the on-boarding process of patients and better operational management of the ED can help reduce many unnecessary hassles faced by residents. Distributing night shifts, weekend work, and holidays evenly and transparently among residents can help impart a sense of fairness and transparency to the work flow in the ED. Emergency medicine is sheer teamwork. It is essential to inculcate a team culture in the ED and make residents feel part of a dynamic community of physicians, nurses, and other emergency healthcare workers. Managing team conflict and employee attrition in the ED can further contribute to this sense of team building. Hospital management should work toward creating a work environment congruent with the core values of emergency medicine, an environment that makes emergency residents and physicians confident of delivering optimal care to all patients presenting to the ED. This can go a long way in improving emergency residents’ job satisfaction and reducing burnout [37].

Our study manifests some limitations. The majority of respondents in our study sample were males, less than 28 years of age, most of them were in the first and second years of the residency program and were unmarried. The majority of the married respondents did not have children. Hence, our study sample was skewed in favor of the male gender, younger age group, earlier years of residency, unmarried residents, and childless couples. While we invited all residents enrolled in the SCFHS emergency residency program to participate in this study, only 73 residents completed the survey as per the study requirements.

In the future, we recommend larger studies to be conducted across Saudi Arabia, among emergency residents, with the objective of providing more robust pan-country estimates of the prevalence and risk factors for burnout. We recommend controlled clinical studies be planned in this area, to ensure desired sample sizes and demographically well-balanced study samples.

Conclusion

This study revealed an alarmingly high magnitude of burnout among emergency residents in Saudi Arabia, with the majority of them reporting low PA and medium to high levels of DP and EE. Female residents were more vulnerable to burnout than males. Age, marital status, and number of children had no correlation with burnout. Emergency residents serving at hospitals of the MoH, Saudi Arabia, reported significantly higher levels of burnout, versus their peers at other institutions. The final year of the residency program showed significantly lower levels of burnout versus the earlier years. To the best of our knowledge, this is the first study from Saudi Arabia, to assess the parameters and causes of burnout,

specifically among emergency medicine residents, in a cross-sectional country-wide sample. The situation warrants urgent remedial measures to reduce the burden of burnout in the ED, to provide a better work culture and environment at the workplace for residents, and to help boost their self-confidence and self-esteem at work.

List of Abbreviations

DP	Depersonalization
ED	Emergency department
EE	Emotional exhaustion
MBI-HSS	Maslach burnout inventory - human services survey
MoH	Ministry of Health
PA	Personal accomplishment
RII	relative importance index
SCFHS	Saudi Commission for Health Specialty
SD	Standard deviation

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Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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Consent to participate

Written consent was obtained from all participants.

Ethical approval

The institutional review board of KAUH, Faculty of Medicine REB approval was obtained during November 2018 (Reference No 435-18), Jeddah, Saudi Arabia, granted ethical approval for the conduct of this study.

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