ORIGINAL RESEARCH

Burnout among Syrian postgraduate residents in medicine, dentistry, and pharmacy: a cross-sectional study

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Purpose: The aim of this study was to compare the prevalence of burnout and determine the predictive factors among the residents in the three major healthcare specialties in Syria (medicine, dentistry, and pharmacy).
Methods: A web-based cross-sectional survey was used to investigate the experienced burnout among residents. The Maslach Burnout Inventory was used as a self-reported scale. Seven burnout-related factors were investigated and included in the survey.
Results: The overall reported prevalence of burnout was 73% (149/204 respondents) in the total sample. Residents in medicine reported the highest values, followed by the residents in dentistry. The residents in pharmacy reported the lowest burnout prevalence. The prevalence was statistically different in selected domains of burnout according to the type of specialty, satisfaction with monthly income, marital status, gender, existence of night shifts, and was inversely correlated with age ($p<0.05$).
Conclusion: Burnout rates among Syrian healthcare residents are high and concerning. Residents in medicine reported the highest percentage. Predictive factors should be considered by the directors of every medical program and the residency administrators.

Key Words: Burnout, Maslach Burnout Inventory, Occupational stress

Introduction

Burnout is a syndrome characterized by emotional exhaustion (EE), depersonalization (DP) (i.e., feeling detached from patients), and a diminished sense of personal achievement [1-3]. It is a psychological condition that is very common among medical residents, with levels higher than in the general population [3,4]. Burnout was first described in the 1970s as a result of the continuing interpersonal pressures at work [5]. Rates of burnout in healthcare providers have been reported to be more than 50% [4,6].

Medical trainees may experience burnout and its negative consequences during residency due to various multiple factors. Some factors are related to the learning environment and organizational structure, such as curriculum designs, excessive workload, assessment methods, lack of supervision, lack of social interpersonal support, competitive environment, and uncertainty about the future [3]. Other factors are personally related to an individual's coping strategies, personal skills, emotional control, and intelligence [4].

Burnout has a considerably negative impact on healthcare systems. Physicians' burnout not only increases the rates of medical errors, but also decreases patient sat-

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isfaction and safety, and leads to unnecessary medical procedures due to poor communication [4,7].

Burnout often results in anxiety, depression, irritability, mood swings, and suicides [3,7]. Early retirement due to burnout, along with its adverse consequences, has a financial impact on healthcare systems [6].

Few studies have focused on burnout in healthcare professionals in developing countries according to Chemali et al. [6]. These countries face numerous challenges in their healthcare systems, including shortages of staff, heavy work overloads for available healthcare providers, and other strains on the healthcare system and its workers.

Recent studies have shown increasing medical errors and staff attrition linked to burnout, which directly threaten the quality of patient care [8]. A scoping review found that the psychological well-being of healthcare professionals is intricately linked to patient care experiences. The review noted that while there is a focus on the negative aspects of mental health, there is a pressing need for interventions that support healthcare professionals' well-being, which in turn enhances patient care outcomes [9]. The evidence from these studies underscores the urgent need for healthcare systems to address burnout among healthcare professionals.

Todate, no study has addressed burnout among Syrian residents in the three major healthcare specialties: medicine, dentistry, and pharmacy. The aim of the current study was to assess the prevalence of burnout among medical, dental, and pharmacy residents in Syria using the Maslach Burnout Inventory (MBI) and to identify related factors.

Methods

1. Study design

This was a web-based cross-sectional survey study. The study protocol was approved by the Institutional Review Board (IRB) at the Syrian Virtual University, Damascus, Syria (IRB approval number: 4279). The study was conducted from September 2023 to January 2024. Residents from the three major healthcare specialties (medicine, dentistry, and pharmacy) in multiple national healthcare centers were asked to complete a cross-sectional survey. The survey (including the MBI scale) was hosted on Google Forms web application (Google LLC, Mountain View, USA). Participants were asked to agree to be included in the study at the beginning of the form. Participation in the survey was voluntary, and data insertion was anonymous with no personal information included. An agreement to release results for scientific purposes was obtained. Completion of the 22 items of MBI was mandatory to consider any participant. A total of 204 residents were included. The sample size was acceptable according to previous similar study designs [10,11].

2. Instrument and scoring

The MBI is the most common self-reported scale for assessing burnout [1,2,4]. It consists of three subscales with 22 items that evaluate the three subdimensions of burnout syndrome. The first subscale, EE, evaluates the feelings and exhaustion at work. The second subscale, DP, measures the empathy and response to the patients during activities. The third subscale, personal accomplishment (PA), evaluates the feelings in terms of success and personal achievements. The MBI scale has demonstrated high validity and reliability in most previous studies [4,6,7].

The MBI was translated from English into Arabic and consisted of 22 items distributed across three subscales: EE, DP, and PA. Each response was provided on a 7-point Likert scale, with the higher values indicating more frequent occurrence. Higher values for EE and DP and lower values of PA indicated burnout.

EE was considered high for values ≥30, moderate for values 18-29, and low for values ≤17. DP was considered high for values ≥12, moderate for values 6-11, and low for values ≤5. PA was considered high for values ≥40, moderate for values 34-39, and low for values ≤33. Participants with high levels of EE, high levels of DP, or low levels of PA were considered to have a high level of burnout.

The survey included some burnout-related risk factors: medical specialty, year of residency, age, gender, satisfaction with monthly income, absence of night shift, and marital status (married or unmarried).

The primary outcome was the percentage of residents that experienced burnout (high EE, high DP, low PA). Secondary outcomes were comparing the residents' burnout scores between residents of medicine, dentistry, and pharmacy in terms of the variables included in the survey (predictive factors).

3. Data analysis

The survey responses were exported from the web application and imported into Microsoft Excel (Microsoft Corp., Redmond, USA). Statistical analyses were performed using the IBM SPSS ver. 20.0 (IBM Corp., Armonk, USA). Statistical significance was set at a p-value less than 0.05. The MBI scores reported in this study were calculated using the summation method. Cronbach's alpha coefficient was used to assess the internal consistency of all 22 items of MBI with values ≥0.5 considered acceptable. The association between burnout and predictive factors was assessed using the chi-square test for categorical variables and the Spearman correlation coefficient for ordinal categorical variables. Descriptive statistics and the percentage of participants experiencing burnout were also calculated.

Results

1. Participant demographics

The study included 204 residents (105 females, 99 males). The medicine subgroup had 115 residents (56.3%), the dentistry subgroup had 53 residents (25.9%), and the pharmacy subgroup had 36 residents (17.6%). The age of the participants ranged from 23 to 33 years, with a mean age of 26.4 years.

2. Internal consistency of MBI subscales

The internal consistency of the MBI items was assessed using Cronbach's alpha coefficient. Cronbach's alpha values were 0.90, 0.87, and 0.89 for the EE, DP, and PA subscales, respectively, indicating a high internal consistency of the MBI items.

3. Prevalence of burnout

Burnout was prevalent among the residents. Burnout was experienced in 80% of medicine respondents (92/115),

Table 1. Burnout Rates by Professional Specialty: Medicine, Dentistry, and Pharmacy

Experienced burnout	Medicine	Dentistry	Pharmacy	Total
Mild\moderate EE or DP–high PA	23 (20.0)	15 (28.3)	17 (47.2)	55 (27.0)
High EE or DP–low PA	92 (80.0)	38 (71.7)	19 (52.8)	149 (73.0)

Data are presented as number (%).
EE: Emotional exhaustion, DP: Depersonalization, PA: Personal accomplishment.

71.7% of dentistry respondents (38/53), and 52.8% of pharmacy respondents (19/36). Overall, burnout was experienced by 73% of the total sample (149/204), as shown in Table 1. This suggests that medicine residents are at a higher risk of burnout compared to their counterparts in dentistry and pharmacy.

4. Correlation between burnout and residency programs

A statistically significant correlation ($p<0.05$) was found between burnout and the residents' programs (medicine, dentistry, and pharmacy), with medicine residents reporting a higher percentage of burnout. Significant differences were observed in the EE and DP scores.

5. Impact of demographic factors on burnout

A statistically significant difference ($p<0.05$) was found in the EE domain based on marital status, with single residents reporting higher levels of burnout. The differences between males and females were also statistically significant ($p<0.05$) in the PA domain, suggesting that female residents may experience lower feelings of PA compared to males.

6. Influence of financial satisfaction on burnout

EE and DP scores were significantly different based on satisfaction with monthly income. A statistically significant correlation ($p<0.05$) was found in these two subscales. Residents who reported dissatisfaction with their income exhibited higher levels of burnout.

7. Effects of night shifts on burnout

The impact of night shifts on burnout was found to be significant. A statistically significant correlation ($p<0.05$) was observed in the DP subscale. Residents working night shifts reported higher burnout scores, indicating that irregular work hours may exacerbate feelings of DP. Table 2 represents the statistical analysis of investigated risk factors (predictive factors) in every subscale.

Table 2. The Association between Burnout Subscales and Predictive Factors

Predictive factors	Subscale	χ^2	df	p-value
Medical specialty	EE	10.488	4	0.0330*
	DP	9.597	4	0.0480*
	PA	4.375	4	0.3580
Residency year	EE	1.826	2	0.4010
	DP	5.474	2	0.0650
	PA	1.802	2	0.4060
Marital status	EE	12.896	6	0.045*
	DP	1.775	6	0.939
	PA	4.384	6	0.625
Gender	EE	0.239	2	0.887
	DP	0.353	2	0.838
	PA	6.618	2	0.037*
Satisfaction with monthly income	EE	15.910	2	0.0000*
	DP	17.322	2	0.0000*
	PA	4.785	2	0.0910
Night shifts	EE	4.538	2	0.1030
	DP	8.419	2	0.0150*
	PA	2.617	2	0.2700

df: Degrees of freedom, EE: Emotional exhaustion, DP: Depersonalization, PA: Personal accomplishment.
*$p<0.05$ (Statistically significant).

8. The prevalence of burnout subscale scores based on the predictive factors

Table 3 represents the respondent percentages in every subscale for every predictive factor separately, which clearly shows the distribution of respondents in every domain according to these predictive factors.

1) The prevalence of emotional exhaustion

High EE was most reported among respondents in medicine (30.4%) compared to dentistry (17.0%) and pharmacy (25.0%). Single respondents reported higher levels of EE (27.2%) compared to married individuals (18.7%). Additionally, those who were not satisfied with their monthly income showed a notable prevalence of high EE at 27.9%, while those satisfied reported 0%.

2) The prevalence of depersonalization

High DP was also prevalent in medicine (79.1%), with significant rates in those working night shifts (80.9%) compared to those not working night shifts (62.8%). Respondents who were not satisfied with their monthly income reported high DP (76.3%). In contrast, only 21.4% of respondents who expressed satisfaction reported a similar experience.

3) The prevalence of low personal accomplishment

Low PA was more prevalent among female respondents (63.5%) compared to males (48.0%).

9. Age and burnout correlation

The Spearman correlation coefficient analysis revealed a statistically significant negative correlation between age

Table 3. Prevalence of High Emotional Exhaustion, High Depersonalization, and Low Personal Accomplishment among Respondents by Predictive Factors

	High emotional exhaustion	High depersonalization	Low personal accomplishment
Medical specialty	-		
Medicine	35 (30.4)	91 (79.1)	69 (60.0)
Dentistry	9 (17.0)	38 (71.7)	25 (47.2)
Pharmacy	9 (25.0)	19 (52.8)	21 (58.3)
Night shift	-		
Existed	34 (30.9)	89 (80.9)	65 (59.1)
Not existed	19 (20.2)	59 (62.8)	50 (53.2)
Marital status	-		
Single	46 (27.2)	125 (74.0)	96 (56.8)
Married	6 (18.7)	21 (65.6)	16 (50.0)
Satisfaction with monthly income	-		
Satisfied	0 (0)	3 (21.4)	4 (28.6)
Not satisfied	53 (27.9)	145 (76.3)	111 (58.4)
Gender	-		
Male	25 (25.5)	71 (72.4)	47 (48.0)
Female	28 (26.9)	75 (72.1)	66 (63.5)
Year of residency	-		
First 2 years	35 (29.9)	90 (76.9)	69 (59.0)
After 2 years	17 (22.4)	55 (72.4)	40 (52.6)

Data are presented as number (%).

Table 4. Correlation between Age and the Three Subscales of Burnout

Variable (age)	Emotional exhaustion	Depersonalization	Personal accomplishment
Spearman correlation (r)	−0.172*	−0.204*	−0.163*
Significance (2-tailed)	0.019	0.005	0.026
No. of total residents	204	204	204

*$p<0.05$ (Statistically significant negative correlation).

and each subscale of burnout ($p<0.05$), as shown in Table 4. This indicates that as age increases, the levels of burnout across all subscales tend to decrease. Older residents tend to experience lower levels of burnout across all subscales.

10. Summary of statistical findings

Certain predictive factors influenced the prevalence of burnout. Medical specialty and satisfaction with monthly income were associated with high EE and DP. Marital status and night shifts were associated with the prevalence of high EE and DP, respectively. Gender differences were found in the PA subscale, with females reporting lower levels compared to males. Finally, a negative correlation was observed between age and burnout subscales.

Discussion

This study aimed at measuring the prevalence of burnout among Syrian residents in medicine, dentistry, and pharmacy as well as to investigate risk factors. Previous studies addressed several issues in the learning and working environments in Syria. A recent study used qualitative and quantitative methods to examine personal skills, reported a lack of effective personal skills among participants [12]. Another study suggested an evaluation tool to enhance the environment for postgraduate medical students [13]. Additionally, two studies highlighted the importance of measuring humanity [14] and medical errors [15] among Syrian healthcare specialties. The results of these studies indicated that burnout-predisposing factors may be associated with residency and health care provision in these environments, justifying the conduct of the current study.

High values for EE and DP, coupled with low values for PA, were considered consistent with burnout. In the current study population, 73% of the total sample experienced burnout. Specifically, 80% of residents in medicine, 71.7% of residents in dentistry, and 52.8% of residents in pharmacy experienced burnout.

The average burnout reported in the current study is very similar to the burnout average found in a study by Dimitriu et al. [16] during the COVID-19 (coronavirus disease 2019) pandemic, which reported an average of 76% of experienced burnout among medical residents. The present findings, showing 73% of the total sample experiencing burnout in a non-pandemic period, are concerning and reveal the stressful nature of healthcare systems in Syria. A study conducted by Ashkar et al. [17] in Lebanon also revealed a similarly high prevalence of burnout, with 80% of their study sample (155 residents) having a high level of burnout in at least one subscale of MBI. These findings suggest that healthcare systems in developing countries may face similar challenges with burnout prevalence.

A meta-analysis by Low et al. [18] revealed a lower prevalence of burnout (57.18%) in several Asian countries compared to the current study. However, their findings suggest a high prevalence of burnout among medical residents. Contrary to the current study, they found that older residents suffered more than their younger counterparts, which may be due to the various designs included in their analysis. Additionally, their study was limited to the medical and surgical residents, while the burnout in dentistry and pharmacy was not within the scope of their analysis.

The differences in burnout levels were statistically significant between the three specialties ($p<0.05$). Residents in medicine reported the highest levels, with a prevalence rate of 80%. The medical specialty itself was a predictive factor for burnout in the current study sample.

Prinz et al. [19] reported higher values of burnout in dentistry than in medicine, particularly, on the DP subscale. They attributed these higher values to students who

showed a higher degree of dysfunctional coping. However, their study investigated burnout differences in the pre-graduation programs between medicine and dentistry students, while the present study focused on the residency programs.

Comparing previous studies that investigated burnout in these specialties separately, they have shown different prevalences. In medicine, the estimated pooled prevalence of burnout ranged from 40% [20] to 82.1% [21]. In dentistry, burnout was present in 46.3% of dental residents [22] and 47.37% in dental anesthesiology residents [23]. The overall prevalence of burnout was 35% in oral medicine and orofacial pain trainees [24]. Among pharmacy residents, the burnout was 74.4% in a study undertaken by Gonzalez and Brunetti [25]. These variations in burnout prevalence and associated factors between studies can be attributed to regional differences, as suggested by a systematic review and meta-analysis by Naji et al. [26].

Burnout prevalence among males and females varied in the previous studies, with the association between burnout and gender being controversial. In the present study, females experienced burnout more than males, which is consistent with the findings of Muteshi et al. [10]. Females in the current study had a high risk of burnout in the PA domain, with 63.5% reporting low PAs compared to 48% of males. In contrast, a study by Prins et al. [27], found that males had a higher risk of burnout compared to females, and Sandhu et al. [24] reported that moderate to high DP burnout was more prevalent in males.

Marital status had a statistically significant effect on burnout prevalence in the EE domain ($p<0.05$) in the current study sample. Unmarried residents reported significantly higher values of EE, which is consistent with the findings of Sandhu et al. [24], who found that unmarried residents reported higher scores of burnouts resulting from EE. The current findings are inconsistent with those of Alqahtani et al. [22], who found higher burnout values among married residents. However, their sample was relatively small and focused on dental residency programs only.

Another predictive factor in the current study sample was satisfaction with monthly income. Statistically significant differences were found in the EE and DP subscales ($p<0.05$), with unsatisfied residents experiencing high EE and DP. These results have significant implications for the quality of patient care and medical staff [10,28], and are consistent with previous studies [29,30], which found that residents with lower incomes had higher burnout levels [29].

The night shift was another associated factor with burnout. Resident who had night shifts reported a high value of DP ($p<0.05$). This finding is supported by the previous study of Nurikhwan et al. [31], who showed that working hours significantly correlated with certain domains of burnout, and Wang et al. [28], who reported a similar finding among residents with excessive workloads and night shifts.

Burnout had a statistically significant negative correlation with age in the three subscales (EE, DP, and PA). The experienced burnout decreases as the age of residents increases ($p<0.05$). This finding is inconsistent with the study undertaken by Ji et al. [29], which reported that residents aged 24 to 29 were less likely to report burnout than those ≥30 years of age. However, a systematic review by Singh et al. [32], supports the current findings, indicating that younger age was a significant factor associated with burnout in dentistry. This diversity in the relationship between age and burnout suggests that the impact of intrinsic factors (e.g., age) and extrinsic factors (i.e., related to the environment) may differ across studies.

Even though the year of residency has no relation to burnout ($p>0.05$), the different impact of age and seniority may be due to the fact that the respondents in the same

residency year are not the same age in the study sample. Kijima et al. [33] found that individual stress coping ability was a significant factor for burnout. It may be assumed that the older residents have a better coping mechanism. Muteshi et al. [10] concluded that burnout is associated with negative coping mechanisms. Additionally, the trainees in their study reported feeling more likely to make medical errors when under stress. This highlights the critical importance of addressing stress management and coping mechanisms in order to prevent and reduce burnout among healthcare residents.

Singh et al. [32] concluded that screening programs and coping strategies could help identify and prevent burnout. The authors of the current study believe that the ministries of health, higher education, public health organizations, and other local associations should have a major role in supporting medical residents during their career to decrease experienced stress and trauma in health care systems and higher education residency.

1. Limitations of the current study

The authors of the current study couldn't exclude the possibility that residents experiencing burnout avoided responding to the survey. The voluntary nature of survey participation resulted in a lower-than-anticipated response rate, which may affect the generalizability of the findings. Logistical constraints inherent in accessing postgraduate residents precluded follow-up with non-respondents. Finally, the unequal numbers of participants in the three subgroups are due to the actual different numbers of residents in these fields in Syria. Future research should consider employing strategies to enhance participation rates, such as offering incentives or utilizing multiple follow-up methods.

2. Conclusion

Burnout during residency exists in Syria with high prevalence, especially among medical residents. Factors like age, satisfaction with monthly income, gender, night shifts, and marital status were statistically related to certain domains of burnout. Strategies should be implemented to effectively address these factors and enhance the medical and learning environments. Medical leaders, mentors, and residents should be mindful of their peers and the forthcoming generation, thereby fostering a less stressful work environment.

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