

# Burnout phenomenon in Saudi dermatology residents: a national assessment of prevalence and contributing factors

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## Abstract

A cross-sectional study was conducted between March and August 2021; an electronic survey was administered to all dermatology residents (n=79) in all centers with the Saudi Board

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Dermatology Training Program in the western, eastern and southern regions. Participation was voluntary, and written informed consent was obtained before the study. The survey was completed by 70 dermatology residents, for an 88.61% response rate. All the participants were aware of the study's aims, and their informed consent was obtained. The study design complied with the Declaration of Helsinki ethical standards and was approved by the Institutional Review Board at Imam Muhammad Ibn Saud Islamic University in Saudi Arabia. A total of 70 respondents completed the questionnaire. High emotional exhaustion (EE) was present in 47.1% of respondents, low personal accomplishment (PA) was present in 65.7%, and high depersonalization (DP) was the least prevalent (24.3%) across all burnout dimensions of dermatology residents. Overall burnout was present in 21.4% of the dermatology residents. Multivariate analysis showed that the odds of EE were significantly lower in males than females [odds ratio (OR)=0.2, P=0.016] and the higher number of patients seen per clinic (OR=1.09, P=0.032) was associated with higher odds of having a high risk of EE, while higher satisfaction with work-life balance was associated with lower odds of a high risk of EE (OR=0.47, P=0.005). A higher number of study hours/week was associated with lower odds of low PA (OR=0.95, P=0.02). Similarly, higher satisfaction with career was associated with lower odds of low PA (OR=0.35, P=0.042). Multivariate analysis showed that only exercise (OR=0.21, P=0.05) and satisfaction with work-life balance (OR=0.42, P=0.008) were associated with a lower risk of burnout. Our study adds the burnout rates among dermatology residents in Saudi Arabia, in addition to possible risk factors that can predict burnout, to the literature. These findings can be applied to improve training programs and reduce the burnout rate among residents.

## Introduction

The burnout concept was first described in the 1970s and referred to as a prolonged reaction to chronic emotional and interpersonal stressors on the job. Burnout is a multidimensional syndrome defined as a combination of cynicism [depersonalization (DP)], a loss of enthusiasm for work [emotional exhaustion (EE)], and a diminished feeling of personal achievement (PA).<sup>1,2</sup> Burnout is considered a work-related matter related specifically to occupational factors, unlike stress, which may be experienced by all life forms.<sup>3</sup> Studies found that burnout is associated with suboptimal patient care, work withdrawal, lower productivity, absenteeism, and the intention to quit the job.<sup>2,4</sup> Burnout syndrome is now considered a public health issue.<sup>5</sup> It may progress to clinical depression if generalized to the home environment, induce or aggravate suicidal ideation, and lead to substance abuse, malpractice, and

medical errors. It has a mental, social, and physical association with people in their workplaces, with a clear effect on their performance and condition of life.<sup>6-8</sup>

In the past few years, the number of studies about burnout has been on the rise, and the concept of burnout has been generalized to all medical professionals.<sup>9-11</sup> Dermatologists usually have the highest rate of professional satisfaction and one of the lowest burnout rates of all medical specialties.<sup>12-15</sup> However, from 2011 to 2014, dermatologists showed an increase in burnout rate from 32 to 57%, ranking the 9th highest after ranking 23rd of 24 specialties.<sup>14</sup> Many previous studies have reported varied burnout rates during residency training programs; however, for dermatology residents, the data are always inadequate. When searching the literature, we found only a few studies on dermatology residents. This study is the completion of our first published research, which focused only on one city (Riyadh, Saudi Arabia).<sup>16</sup> Accordingly, the objectives of this study were: i) to determine the prevalence of burnout levels among dermatology residents in Saudi Arabia; ii) to have a better clarification and understanding of the factors associated with burnout.

## Materials and Methods

A cross-sectional study was conducted between March 2021 and August 2021; an electronic survey was administered to all dermatology residents (n=79) in all centers with the Saudi Board Dermatology Training Program in the western, eastern, and southern regions. Participation was voluntary and written informed consent was obtained before the study. The survey was completed by 70 dermatology residents, with an 88.61% response rate. All the participants were aware of the study's aims, and their informed consent was obtained. The study design complied with the Declaration of Helsinki ethical standards and was approved by the Institutional Review Board at Imam Muhammad Ibn Saud Islamic University in Saudi Arabia.

The questionnaire included two main parts. The first part collected information on age, gender, marital status, smoking status, and residency level. The satisfaction of the respondents with their career, salary, and life/work balance was assessed using three Likert-scale items on a scale from 1 (very unsatisfied) to 5 (very satisfied). One question was included to assess whether respondents ever failed their promotion or part exams. Two questions were included to assess the relationship between the respondents and their mentors and whether they mentored other residents/students. Respondents were also asked about their perceived job opportunities and professional and personal lives after residency. Two additional questions were added to assess whether respondents had serious thoughts about changing or quitting the program. The questionnaire also included questions about the average number of sleeping hours, on-calls/month, clinics/weeks, hospital working hours, and average number of patients under daily care. Two additional questions were used to assess whether the respondents considered psychiatric visits or anti-depressants. The second part was the validated measure of burnout, the Maslach burnout inventory (MBI-HS), which includes 22 questions to assess three domains of burnout: EE (9 questions), DP (5 questions), and PA (8 questions). High EE and DP scores are associated with higher burnout, whereas higher PA scores are associated with lower burnout. High EE was defined as an EE score >26, while high DP was defined as a DP score >12. Low PA was defined as a PA score <32. Two-dimensional burnout was defined as coexisting high EE and high DP, while three-dimensional burnout was defined as low

PA, high EE, and high DP.<sup>1</sup>

Data were analyzed using the Statistical Package for Social Sciences ver. 20 (SPSS, Chicago, IL, USA). Counts and percentages were used to summarize participants' demographics. Mean±standard deviation was used to summarize continuous variables. Burnout dimensions and overall burnout were analyzed as continuous and categorical (dichotomous) variables based on the previously mentioned cut-off criteria. Likert-scale items (satisfaction with job, career, and life/work balance) were summarized using counts and percentages. Bar plots were used to visualize the responses for the Likert-scale items. The chi-square test of independence was used to assess whether the distribution of EE, DP, PA, and burnout was significantly different between residency years. Bar plots were used to visualize the responses to the Likert-scale items and the prevalence of burnout.

Binary logistic regression was used to assess factors associated with burnout dimensions and overall burnout. The odds ratio (OR) was calculated for each factor and tested for statistical significance using univariate binary logistic regression. Multivariate binary logistic regression was used to estimate the adjusted estimate for each of the factors. Only factors that were significantly associated with the outcomes at the 0.1 level in the univariate analysis were included in the multivariate models. Four models were constructed: one for each of the three dimensions of burnout as well as one for overall burnout. All IVs were initially included in the model. A backward approach (using the p value for the Wald Chi-square statistics) was used for variable selection. Variables were kept in the model if the p value for the multivariate Wald-Chi square statistic in the final model was <0.1. Two-tailed hypothesis testing was performed at  $\alpha=0.05$ . OR and 95% confidence intervals were calculated for the IVs included in the analysis. Exercise, age, and residency level were dichotomized before the analysis. Satisfaction with various aspects of the job was treated as a continuous variable.

## Results

The questionnaire was completed by 70 respondents (50% males and 50% females). Respondents aged 25-27 years represented half of the study sample, while respondents aged 28-30 and 31-33 years represented 42.9% and 7.14%, respectively. Married residents represented 58.6% (n=41) of the study sample. Various residency levels were represented in the study sample, with residency 1 representing only 8.57%. Most of the included residents did not smoke (n=53, 75.7%). The average number of working hours in the hospital was 9.79±7.32 while the average number of on-calls per month was 5.79±2.38. The average number of sleeping hours per day was 6.93±1.76, and the average number of clinics/weeks was 6.41±7.48. The average number of patients under daily care was 16.9±17.4. Approximately one-third of the residents considered a psychiatric visit (n=22, 31.4%) and a similar number considered taking antidepressants (n=21, 30%). One-quarter of the residents considered quitting (n=34, 48.6%) (Table 1). Results showed that 80.5% of the residents were very satisfied or satisfied with their careers, 52.9% were satisfied with their salary, and 44.2% were satisfied with the work-life balance. Results showed that more than 90% of the respondents thought their professional and personal lives would improve after residency, while one-half thought that it was likely or very likely that they would get a fair job opportunity after residency.

Results showed that high EE was present in 47.1% (n=33) of dermatology residents, while low PA was present in 65.7%

**Table 1.** Descriptive statistics for the study sample (n=70). Categorical variables were summarized using counts and percentages. Continuous variables were summarized using the mean±standard deviation.

	N (%)
Age	
25-27	35 (50.0)
28-30	30 (42.9)
31-33	5 (7.14)
Gender	
Female	35 (50.0)
Male	35 (50.0)
Marital status	
Unmarried	29 (41.4)
Married	41 (58.6)
Residency level	
R1	6 (8.57)
R2	23 (32.9)
R3	23 (32.9)
R4	18 (25.7)
Do you smoke?	
No	53 (75.7)
Yes	17 (24.3)
Average hours of sleep/day (mean±SD)	6.93 (1.76)
Average number of on-call/month (mean±SD)	5.79 (2.38)
Average number of hours working in the hospital/day (mean±SD)	9.79 (7.32)
Average number of clinics/week (mean±SD)	6.41 (7.48)
Average number of patients under daily care (mean±SD)	16.9 (17.4)
Mentor for other residents/students?	
No	42 (60.0)
Yes	28 (40.0)
Benefit from your relationship with mentor?	
No	22 (59.5)
Yes	15 (40.5)
Ever failed your (promotion and/or part) exams?	
No exams	7 (10.0)
Never	47 (67.1)
Once	11 (15.7)
Twice	3 (4.29)
>Twice	2 (2.86)
Likelihood of getting a fair job after residency?	
Very unlikely	2 (2.86)
Unlikely	8 (11.4)
Neutral	21 (30.0)
Likely	23 (32.9)
Very likely	16 (22.9)
Likelihood of professional and personal life improvement after residency?	
Very unlikely	1 (1.43)
Unlikely	0 (0)
Neutral	6 (8.57)
Likely	19 (27.1)
Very likely	44 (62.9)
Ever given serious thoughts to quitting?	
No	36 (51.4)
Yes	34 (48.6)
Ever considered taking antidepressants?	
No	49 (70.0)
Yes	21 (30.0)
Ever considered a psychiatrist visit?	
No	48 (68.6)
Yes	22 (31.4)

SD, standard deviation.

(n=46). High DP was the least prevalent across all burnout dimensions (n = 17, 24.3%). A high risk of burnout was present in 15 (21.4%) of the dermatology residents (Table 2). When burnout was explored as a two-dimensional measure, 21.4% of the respondents were at high risk of burnout. The percentage decreased to 15.7% when burnout was explored as a three-dimensional measure (Figure 1).

Multivariate analysis showed that the odds of EE were significantly lower in males than females (OR=0.2, P=0.016). A higher number of patients seen per clinic (OR=1.09, P=0.032) was associated with higher odds of having a high risk of EE, while higher satisfaction with work-life balance was associated with lower odds of a high risk of EE (OR=0.47, P=0.005). Only salary showed a statistically significant association with DP when multivariate logistic regression analysis was used (OR=0.45, P=0.019). Regarding PA, a higher average number of clinics/weeks was associated with lower odds of having low PA (OR=0.56, P=0.043). A higher number of study hours per week was associated with lower odds of low PA (OR=0.95, P=0.02). Similarly, higher satisfaction with career was associated with lower odds of low PA (OR=0.35, P=0.042).

Univariate analysis showed that exercise was associated with a lower risk of burnout (OR=0.22, P=0.042), indicating that respondents who exercise are 78% less likely to be at high risk of burnout. A higher average number of patients seen per clinic (OR=1.07, P=0.008) was also associated with a higher risk of burnout. Higher satisfaction with salary (OR=0.53, P=0.024) and work-life balance (OR=0.41, P=0.006) were associated with a lower risk of burnout. Multivariate analysis showed that only exercise (OR=0.21, P=0.05) and satisfaction with work-life balance (OR=0.42, P=0.008) were associated with a lower risk of burnout (Table 3). The chi-square test of independence showed that the distribution of DP and PA was not significantly different between regions (P=0.425 and 0.087, respectively). The prevalence of two-dimensional burnout was not significantly different between regions, while the prevalence of three-dimensional burnout was significantly higher among respondents from the southern region (P=0.033). EE was also more prevalent in respondents from the southern region (P=0.013) (Table 4). Figure 2 shows the prevalence of various burnout dimensions by region.

**Table 2.** Prevalence of burnout in the study sample (n=70).

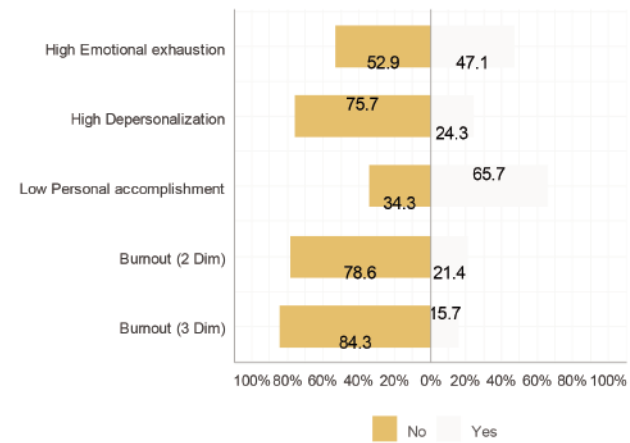
	N (%)
EE (mean±SD)	26.8 (13.9)
DP (mean±SD)	9.36 (6.37)
PA (mean±SD)	26.9 (9.32)
High emotional exhaustion	
No	37 (52.9)
Yes	33 (47.1)
High depersonalization	
No	53 (75.7)
Yes	17 (24.3)
Low personal accomplishment	
No	24 (34.3)
Yes	46 (65.7)
Burnout, two-dimensional	
No	55 (78.6)
Yes	15 (21.4)
Burnout, three-dimensional	
No	84.3
Yes	15.7

EE, emotional exhaustion; DP, depersonalization; PA, personal accomplishment, SD, standard deviation.

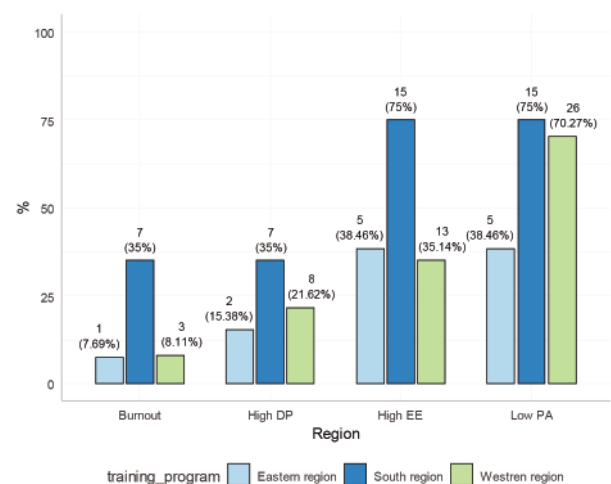
## Discussion

Significant studies conducted over many years have shown that the risk of burnout is higher among healthcare professionals. Due to the intense emotional demands of the work environment, physicians (in particular, residents) are susceptible to developing burnout above and beyond usual workplace stress.<sup>13,17</sup> Residency burnout rates range from 18 to 84%.<sup>18</sup> In comparison to other specialties, dermatology burnout has become much higher than it was in the past. Although, according to the 2018 Medscape national physician burnout and depression report, 32% of dermatologists are burned out, which represents a large decrease in dermatology burnout from 46% in 2017. However, the threat of burnout in dermatology has not disappeared.<sup>19</sup>

In our study, we used the MBI-HS, which is the gold standard measure of burnout and has been used in approximately 88% of all research on burnout.<sup>20</sup> To perfectly understand and defy burnout in dermatology, it is crucial to identify the factors that cause dermatologists to feel burned out. Residency-related factors, such as sleeping hours, on-call/month, working hours, clinics/week,



**Figure 1.** Prevalence of burnout across dermatology residents.



**Figure 2.** Prevalence of burnout dimensions across residency years.

**Table 3.** Factors associated with burnout (three-dimensional).

Demographic characters	No	Yes	Univariate LR OR [95% CI]	P*	Multivariate LR OR [95% CI]	P**
<b>Training program</b>						
Eastern region	12 (20.3%)	1 (9.09%)	Ref.	Ref.		
South region	13 (22.0%)	7 (63.6%)	5.59 [0.79;158]	0.091		
Western region	34 (57.6%)	3 (27.3%)	0.98 [0.10;30.1]	0.988		
<b>Age</b>						
<28	29 (49.2%)	6 (54.5%)	Ref.	Ref.		
28+	30 (50.8%)	5 (45.5%)	0.81 [0.21;3.07]	0.756		
<b>Gender</b>						
Female	29 (49.2%)	6 (54.5%)	Ref.	Ref.		
Male	30 (50.8%)	5 (45.5%)	0.81 [0.21;3.07]	0.756		
<b>Marital status</b>						
Married	24 (40.7%)	5 (45.5%)	Ref.	Ref.		
Unmarried	35 (59.3%)	6 (54.5%)	0.82 [0.22;3.25]	0.773		
<b>Residency</b>						
R1	5 (8.47%)	1 (9.09%)	Ref.	Ref.		
R2	20 (33.9%)	3 (27.3%)	0.71 [0.06;23.5]	0.807		
R3	18 (30.5%)	5 (45.5%)	1.27 [0.14;39.3]	0.850		
R4	16 (27.1%)	2 (18.2%)	0.61 [0.04;22.0]	0.740		
<b>Smoking status</b>						
No	46 (78.0%)	7 (63.6%)	Ref.	Ref.		
Yes	13 (22.0%)	4 (36.4%)	2.02 [0.45;8.06]	0.339		
<b>Exercise</b>						
No	28 (47.5%)	9 (81.8%)	Ref.	Ref.		
Yes	31 (52.5%)	2 (18.2%)	0.22 [0.03;0.95]	0.042	0.21 (0.03-0.99)	0.05
<b>Residency related factors</b>						
Sleeping hours	7.07 (1.66)	6.18 (2.18)	0.67 [0.41;1.10]	0.116		
On-call/month	5.83 (2.45)	5.55 (2.07)	0.95 [0.73;1.24]	0.714		
Working hours	10.1 (7.91)	8.09 (1.76)	0.94 [0.81;1.09]	0.430		
Clinics/week	6.51 (8.14)	5.91 (1.22)	0.99 [0.87;1.11]	0.811		
Patients/clinic	13.6 (10.3)	34.5 (32.6)	1.07 [1.02;1.12]	0.008		
Study hours/week	23.6 (20.3)	15.2 (13.0)	0.97 [0.92;1.02]	0.182		
<b>Satisfaction</b>						
Salary	3.78 (1.13)	2.82 (1.47)	0.53 [0.31;0.92]	0.024		
Career	4.42 (1.00)	3.91 (1.14)	0.66 [0.38;1.15]	0.141		
Balance	3.47 (1.28)	2.09 (1.38)	0.41 [0.22;0.78]	0.006	0.42 (0.2-0.75)	0.008

LR, linear regression; OR, odds ratio; CI, confidence interval; \*p<0.1; \*\*p<0.05.

**Table 4.** Prevalence of burnout across regions. Data were summarized using counts and percentages. Analysis was performed using the chi-square test of independence.

	East, n=13 N (%)	South, n=20 N (%)	West, n=37 N (%)	P
<b>Emotional exhaustion</b>				
Low	8 (61.5)	5 (25.0)	24 (64.9)	0.013
High	5 (38.5)	15 (75.0)	13 (35.1)	
<b>Depersonalization</b>				
Low	11 (84.6)	13 (65.0)	29 (78.4)	0.425
High	2 (15.4)	7 (35.0)	8 (21.6)	
<b>Personal accomplishment</b>				
High	8 (61.5)	5 (25.0)	11 (29.7)	0.087
Low	5 (38.5)	15 (75.0)	26 (70.3)	
<b>Burnout (2 dim)</b>				
Low	11 (84.6)	13 (65.0)	31 (83.8)	0.243
High	2 (15.4)	7 (35.0)	6 (16.2)	
<b>Burnout (3 dim)</b>				
Low	12 (92.3)	13 (65.0)	34 (91.9)	0.033
High	1 (7.69%)	7 (35.0)	3 (8.11)	



patients/clinic, study hours/week, satisfaction, career, work-life balance, and exercise, that predict burnout were mentioned in this article. Our result showed that respondents who exercise are 78% less likely to be at high risk of burnout. A higher average number of patients/clinic (OR=1.07, P=0.008) was also associated with a higher risk of burnout, while higher satisfaction with salary (OR=0.53, P=0.024) and work-life balance (OR=0.41, P=0.006) were associated with a lower risk of burnout. This is in accordance with a cross-sectional study performed at the dermatology board training centers in Riyadh, Saudi Arabia, which showed that higher satisfaction with salary (OR=0.21, p<0.05), career (OR=0.04, p<0.05), and work-life balance (OR=0.12, P=0.05) were associated with lower odds of burnout, while average daily sleeping hours showed a statistically significant association with a high risk of burnout (OR=0.64, P=0.05).<sup>16</sup> While the distribution of DP, PA, and prevalence of two-dimensional burnout was not significantly different between regions, the prevalence of three-dimensional burnout and EE was significantly higher in respondents from the southern region in our study.

MBI-HS described burnout in three dimensions: EE, DP, and a diminished feeling of PA. EE represents feelings of being overextended and depleted of emotional resources. DP includes detachment, negative feelings, and cynical attitudes toward the recipient of services. The final component, diminished feeling of PA, refers to negative self-evaluation and feelings of reduced efficacy or accomplishment.<sup>21</sup> Our study results showed that high EE was present in 47.1% of dermatology residents, low PA was present in 65.7% of them, and high DP was the least prevalent across all burnout dimensions (24.3%). A high risk of burnout was present in 21.4% of the participants. Similarly, the percentages of EE, low sense of PA, and DP were 41.2%, 45.1%, and 13.7%, respectively, among dermatology residents in Riyadh. The overall burnout rate was only 7.8%.<sup>16</sup> Therefore, it can be deduced from these results that nationally, in Saudi Arabia, the overall burnout rate among dermatology residents is low (less than 50%), while depolarization has the least prevalence among them.

In contrast to the results found in Saudi Arabia, the burnout rate is higher among dermatology residents worldwide, while PA is the least prevalent among them. Higher EE (54%) and DP (40%) scores and lower PA (40%) were found in Canadian dermatology residents in a cross-sectional study conducted using an online survey.<sup>15</sup> Although the overall burnout prevalence was not mentioned in this study, another study was conducted among dermatology residents in Texas, United States, in 2020, using the Oldenburg burnout inventory as the assessment tool. Burnout was prevalent in 51.89% of the dermatology residents.<sup>20</sup>

Generally, burnout is associated with several negative consequences, including depression, the risk of medical errors, and negative effects on patient safety. It may be associated with decreased productivity and decreased job satisfaction.<sup>13</sup> In their study, Namigr *et al.* reported that the most important result of burnout is impaired quality and quantity of the given service; it also causes serious physical and mental problems in individuals.<sup>17</sup> The rates of depression, suicidal ideation, plans, and attempts were noted to be high in burnout states and tended to decline with recovery. Other risks include cardiovascular disease and increased inflammation biomarkers. Physical symptoms may take many different forms, including insomnia, appetite changes, fatigue, colds or flu, headaches, and gastrointestinal distress.<sup>13</sup> A review article by Niku *et al.* states that It is possible that the experience of emotional exhaustion and poor functioning may trigger a depressive episode. This review article also reported that Shanafelt *et al.* found that 90% of residents who screened positive for depression had high burnout scores at that single time point, while 51% of residents

with burnout reported a history of major depression during residency and 31% screened positive for depression.<sup>18</sup> In our study, we found that 31.4% of the residents considered a psychiatric visit and 30% were taking antidepressants.

Studies suggest that the burden of burnout symptoms continues during the transitional period from medical school into residency.<sup>22,23</sup> Dermatology is commonly cited as one of the most preferred and desired specialties among medical students. Despite the increasing number of dermatology residency positions throughout the years, it is still considered one of the most competitive specialties in terms of matching of applicants.<sup>24</sup> Factors can differ when choosing a future specialty. The literature suggests that another potential trigger for burnout was enrollment in a certain specialty for the wrong reasons, including income and prestige; these people seem to experience burnout faster than others.<sup>16</sup> A study done in the United Kingdom showed the most important factors in choosing dermatology were working hours and conditions. Similar findings were found in a study in the US that showed that a controllable lifestyle in a specialty, with a higher income and fewer years of training, was preferred when considering a future specialty.<sup>25,26</sup>

One of the limitations of our study is its cross-sectional design, which is incapable of evidencing causation. Despite a good response rate, the small sample size, although representing the whole population, is another limitation. Our study was conducted among participants in three regions in Saudi Arabia (the western, eastern, and southern regions), which can be generalized nationally in Saudi Arabia while comparing it with the study conducted in Riyadh. It also adds to the literature about burnout rates among dermatology residents in Saudi Arabia, in addition to possible risk factors that can predict burnout. Understanding the individual components of burnout and its predictors can help determine the source.

## Conclusions

Dermatology is mostly viewed as a lifestyle-friendly specialty; however, findings in our study and other studies in the literature indicate that no specialty is immune to burnout. The numerous negative consequences of burnout, including depression, the risk of medical errors, and negative effects on patient safety make salient the importance of considering factors and ways to combat this phenomenon to prevent regression. Although individual interventions, like exercise, have been found helpful in fighting burnout, institutional interventions are highly recommended.

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