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ORIGINAL RESEARCH

Factors associated with psychological distress in emergency medicine residents: findings from a single-center study

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Abstract

Emergency medicine (EM) residents face significant levels of psychological stress from work and non-work-related factors which can impact their well-being. The objective of this study was to determine the factors that may worsen or mitigate the prevalence of psychological distress among EM residents in a university-based tertiary medical center. Over a 3-month period, after an EM block, residents completed a survey on their demographics, work-related factors, and the Kessler-10 psychological distress scale. Fisher's exact and Pearson correlation coefficient were used to determine statistical significance. Significant variables were then analyzed using ordinal and multiple linear regression to determine predictor variables. The study enrolled 38 participants, with an average age of 27 $\pm$ 1.5 years and a male preponderance. 44.74% had varying degrees of psychological distress, with females more likely experiencing severe distress. Participants who reported curtailing their daily activities more frequently were found to have a 1.58 times higher likelihood of severe psychological distress. Participants remaining after end-of-shift to complete tasks and those experiencing more negative interactions with colleagues had significantly higher levels of distress. We found a high prevalence of varying degrees of psychological distress among emergency medicine residents with almost one fifth in our study population having a high likelihood of severe distress. Female gender and work-related problems that lead to a reduction in normal daily activities seem to correlate with the severity of psychological distress in EM residents. However, future research would need to account for a wider range of institutional, social and societal factors that may contribute to residents' likelihood of psychological distress. Nonetheless, it is essential for residents, mentors of residents, and residency program directors and personnel to understand reasons behind these factors, *i.e.*, negative interactions with colleagues and increased workload and to strategize early identification and mitigation techniques to promote resident wellness.

Keywords

Emergency medicine residents; Burnout; Psychological distress; Kessler-10

1. Introduction

Psychological distress is a multifactorial construct leading to poor psychological function and quality of life, which may occur as a direct consequence of burnout and is closely linked with all burnout dimensions [1, 2]. Burnout, defined by the International Classification of Diseases (ICD-11) as chronic, unsuccessfully managed workplace stress [3], is characterized by emotional exhaustion (EE), depersonalization (DP) with negativity or cynicism toward one's job, and a sense of lack of personal accomplishment (PA) [4].

Although psychological distress and burnout are two constructs within the realm of mental health that have garnered significant attention in research literature. While they are distinct concepts, there is a growing body of evidence suggesting a nuanced interplay between them. It is crucial to acknowledge that the presence of higher levels of psychological distress does not automatically imply the occurrence of burnout. Nevertheless, several studies have investigated the potential correlation between these phenomena, and a prevailing theme suggests the existence of a linear relationship between the two [5–8].

Postgraduate residents in all specialties face multiple stressors throughout their training. Residents in EM function in a particularly stressful environment with multiple work and non-work-related stressors that have both short- and long-term psychological effects [9]. Work-related factors contributing to burnout include long hours, increased workload, violence and traumatic experiences in the workplace, and poor staffing

[10]. These acute stressors can impair well-being and cognitive performance, leading to burnout and its associated negative outcomes for patients, other medical personnel, and their respective institutions [11, 12]. Burnout is also influenced by non-work-related factors, such as gender, work-family conflict, age and lifestyle [13, 14]. Identifying these risk factors and stressors is essential for enhancing residents' quality of life and indirectly, patient care.

Various methods have been used to objectively determine burnout and psychological distress. The most widely used burnout scale is the Maslach Burnout Inventory (MBI), which assesses individual burnout across the three domains of EE, DP and PA [4]. A widely accepted tool to assess psychological distress is the Kessler-10 (K10) rating scale, developed by Kessler *et al.* [15]. The K10 scale is reliable and highly specific for screening mental health illnesses and has been used in several populations, including health care workers [2, 16, 17].

The prevalence of burnout among physicians in Saudi Arabia has been investigated in previous studies conducted among health care workers, particularly those working in the emergency medicine department. These studies reported a high prevalence of burnout, reaching as high as 75% during the beginning of the COVID-19 pandemic [18, 19]. Recent studies using the K10 and the Kessler-6 (K6) scales for psychological distress have shown high levels of psychological distress among various Saudi health care workers, including prehospital providers, nurses, allied health professionals and doctors [20, 21]. A comparison of junior residents in three postgraduate residency training programs for psychological distress using the K10 scale showed a higher prevalence among emergency medicine residents [9]. Therefore, it is essential to determine the predisposing factors associated with distress in EM residents so strategies can be adopted to mitigate this distress and improve the psychological well-being of these young physicians.

The objective of this study was to determine the prevalence of psychological distress and its associated factors among EM postgraduate residents in a large university-based tertiary medical center in Saudi Arabia. The goal was to help delineate demographic, lifestyle and work-related factors associated with psychological distress to afford residents, mentors and program directors a means for the early identification of individuals at risk of developing psychological distress, rectifying factors leading to psychological distress and thereby preventing its occurrence.

2. Methods

This cross-sectional analytical study was conducted in the Adult and Pediatric Emergency departments of a large university-based tertiary medical center over a 3-month period from November 2022 to January 2023. This tertiary care medical center in Saudi Arabia caters to a large caseload of medical and traumatic emergencies. Emergency medicine residents from the center's emergency residency program across all years of training were targeted for the survey. For sample size estimation, because there were no prior values for the proportions to be estimated, we assumed that 50% of the subjects in the population would be affected by burnout. The sample size was determined using a single proportion formula, a 95% confidence interval, and a precision of 0.05. The recommended sample size was 38 for a population size of 45 for estimating the expected proportion [22].

Residents who were not willing to participate or to provide consent were excluded from the study.

A Google Form survey questionnaire was distributed *via* email to Emergency Medicine residents. They were requested to complete the survey within a 2-day timeframe, subsequent to finishing a 4-week emergency medicine block. This process was reiterated over a period of 3 months, encompassing all residents meeting the specified criterion who were not engaged in conducting the study. Informed consent was obtained prior to survey access, and participants had the option to withdraw at any time, including after survey submission. Each EM resident typically completes a 4-week block in the emergency department, working 8-hour shifts in both adult and pediatric units within the department. Data was collected in the first 2 days after the completion of a 4-week block. Data collection was performed in this manner, as the K10 distress scale measures psychological distress experienced within 4 weeks prior to survey administration.

The survey questionnaire consisted of four sections. The first section captured the participants' demographic characteristics, such as age, gender, marital status, year of training, lifestyle (specifically smoking status and exercise regularity) and their daily hospital commute. Second, the work/shift section determined the number of shifts per participant per assessment period, the number of patients seen per shift, the time spent completing any pending tasks after shifts, and the presence and frequency of any negative interactions such as demeaning, belittling, verbal harassment, or abuse by any member of the treating team (*i.e.*, consultants, residents, interns, medical students) or consulted specialty service teams. The third section explored the effect of these shift-related problems in terms of the number of days participants were either unable to complete or had to reduce their work, study or daily activities. This third section also explored how many times participants had sought help from other physicians or health care professionals, and how many deaths had occurred in patients under their care in the prior four weeks. The final section included the K10 psychological distress instrument.

The K10 is a valid and reliable screening tool with good precision and consistent psychometric properties across different sociodemographic populations [16, 17]. The English version of the tool was utilized for this research. The K10 survey tool consists of 10 questionnaire items scored on a 5-point Likert-type scale, with the following response options: 1—none of the time, 2—a little of the time, 3—some of the time, 4—most of the time and 5—all the time. The K10 questionnaire items can identify both anxiety and depression using a single scale. The total score for each participant ranges from 10–50, with higher scores reflecting higher levels of psychological distress [2]. Score-ranges are 10–19, 20–24, 25–29 and 30–50 which translate to likelihood of having "no", "mild", "moderate" or "severe" distress, respectively. For this study, a cutoff score of 19 was used, and any score equal to or higher than 19 indicated the presence of psychological distress, based on evidence from

the 2001 Victorian Population Health Survey [23].

The collected data was input and analyzed using the statistical software NCSS version 2020 (NCSS, LLC, Kaysville, Utah, USA) [24].

Frequency counts and percentages for categorical variables, and means and standard deviations (SDs) for continuous variables, are reported. Associations between categorical variables were determined using Fisher's exact test because some of the variables in the sample included cells with fewer than five individuals. Correlations between continuous variables were assessed using the Pearson correlation coefficient test.

All variables that were significantly correlated and associated with psychological stress were then utilized for regression analysis. Ordinal regression analysis was used and the outcome variable was categorized as ordered levels of psychological distress by assuming equal steps between categories. The K10 score, as a continuous outcome, was then tested using multiple linear regression with the same predictors as the ordinal regression model, and the model's accuracy was optimized using the stepwise selection methods. The significance level for all associations was set as $p \leq 0.05$.

3. Results

3.1 Characteristics of the study respondents

The study participants had an average age of 27 ± 1.5 years old, with a male preponderance (n = 25, 65.79%). Most of the participants (n = 27, 71.05%) were nonsmokers. None of the married participants (n = 6, 15.79%) had children. The sociodemographic characteristics of the participants are outlined in Table 1.

TABLE 1. Sociodemographic characteristics of the participants.

Characteristics	n (%)
Gender	
Male	25 (65.79)
Female	13 (34.21)
Age (Mean ± SD)	27 ± 1.5
Repeated a training year	
None	37 (97.37)
Once	1 (2.63)
Marital status	
Single	32 (84.21)
Married	6 (15.79)
Professional status	
PGY-1	13 (34.21)
PGY-2	3 (7.89)
PGY-3	12 (31.58)
PGY-4	10 (26.32)
Exercise history	
Never	22 (57.89)
1–2 times per week	6 (15.79)
3–4 times per week	10 (26.32)
≥5 times per week	0 (0)
Average commute	
<20 min	14 (36.84)
20–40 min	19 (50.00)
40–60 min	4 (10.53)
>60 min	1 (2.63)

Abbreviations: PGY: postgraduate year; SD: standard deviation.

3.2 Psychological distress scores

Using the K10 score cutoff value of 19 for psychological distress, 17 (44.74%) of the participants had varying degrees of psychological distress, as shown in Fig. 1. Psychological distress in females was higher than that in males.

3.3 Relationship between psychological distress and associated factors

The bivariate analysis from Fisher's exact test showed that psychological distress significantly varied by gender, with females experiencing more psychological distress than males in the study sample ($p < 0.05$). There was no association between psychological distress and all other sociodemographic factors (professional level, marital status, smoking history, exercise and average commute time). These results are highlighted in Table 2.

Table 3 illustrates the association between psychological distress and work/shift-related factors among the study participants. Participants who spent more time completing remaining tasks after end-of-shift had significantly higher levels of psychological distress. Moreover, an increased frequency of negative interactions (demeaning, belittling, verbal harassment or abuse) with the team of physician-trainee colleagues (residents, interns, medical students) was also linked to higher psychological distress.

Participants who faced shift-related problems were also asked about the impact of these problems on their professional activities, *i.e.*, whether they were totally unable to perform or had to reduce their work, study or daily activities and whether they had sought help from another health care professional. Participants who had reduced their work, study or daily activities had higher levels of psychological distress. There was a significant weak positive correlation of psychological distress in cases where participants sought help from another health care professional or experienced the death of patients under their care within the last 4 weeks.

Table 4 highlights these associations between K10 scores and the impact of shift-related problems.

3.4 Ordinal logistic regression analysis

All the factors that showed a significant association with psychological distress in the correlation and association analysis were chosen for the multivariable proportional odds model, with the outcome variable being the likelihood of psychological distress based on the K10 score (Table 5). The predictor variables were tested a priori to verify that there was no violation of the assumption of multicollinearity. The overall assumption of proportionality in this study was not violated, as the p value was 0.997 and exceeded 0.05.

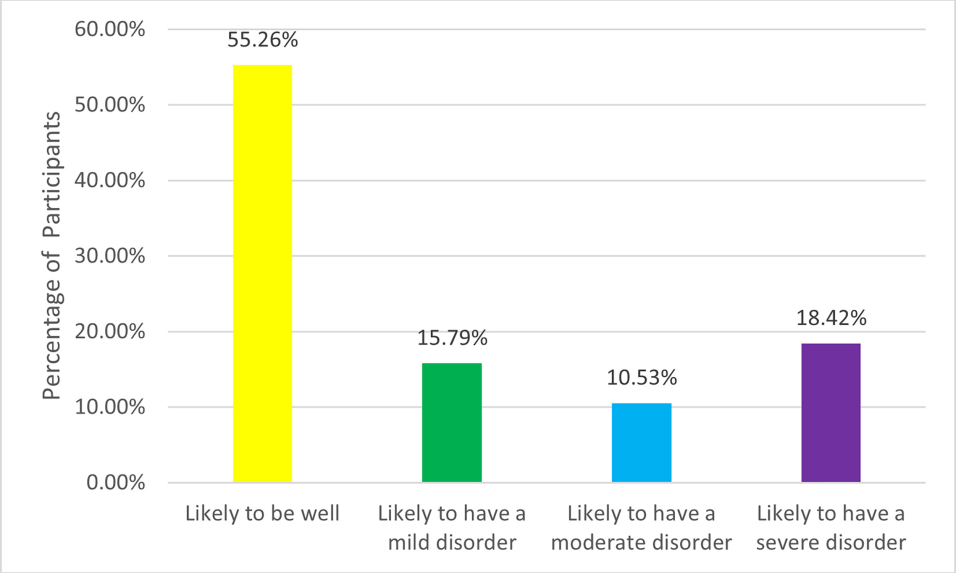

FIGURE 1. Likelihood of participants having psychological distress based on the Kessler-10 (K10) scale. Participants' scores spanned across the four likelihood ranges with a little over half in the "Likely to be well" range and almost one fifth in the "Likely to have severe disorder" range.

TABLE 2. Association between psychological distress and sociodemographic factors.

Social factors	Psychological status, n (row %) (total %)				*p* value
	Likely to be well	Mild disorder	Moderate disorder	Severe disorder	
Marital status					
Single	16 (50.00) (42.11)	6 (18.75) (15.79)	3 (9.38) (7.89)	7 (21.88) (18.42)	0.133
Married	5 (83.33) (13.16)	0	1 (16.67) (2.63)	0	
Gender					
Female	3 (23.08) (7.89)	2 (15.38) (5.26)	3 (23.08) (7.89)	5 (38.46) (13.16)	0.012*
Male	18 (72) (47.37)	4 (16.00) (10.53)	1 (4.00) (2.63)	2 (8.00) (5.26)	
Professional level					
PGY-1	6 (46.15) (15.79)	4 (30.77) (10.53)	1 (7.69) (2.63)	2 (15.30) (5.26)	0.456
PGY-2	2 (66.67) (5.26)	1 (33.33) (2.63)	0	0	
PGY-3	7 (58.33) (18.42)	1 (8.33) (2.63)	1 (8.33) (2.63)	3 (25.00) (7.89)	
PGY-4	6 (60.00) (15.79)	0	2 (20.00) (5.26)	2 (20.00) (5.26)	
Smoking status					
Non-smoker	15 (55.56) (39.47)	2 (7.41) (5.26)	4 (14.81) (10.53)	6 (22.22) (15.79)	0.065
Smoker	6 (54.55) (15.79)	4 (36.36) (10.53)	0	1 (9.09) (2.63)	
Exercise					
None	9 (40.91) (23.68)	4 (18.18) (10.53)	3 (13.64) (7.89)	6 (27.27) (15.79)	0.217
1–2 times per week	4 (66.67) (10.53)	1 (16.67) (2.63)	0	1 (16.67) (2.63)	
3–4 times per week	8 (80.00) (21.05)	1 (10.00) (2.63)	1 (10.00) (2.63)	0	
≥5 times per week	0	0	0	0	
Average commute time to the hospital					
<20 min	4 (28.57) (10.50)	5 (35.71) (13.20)	2 (14.29) (5.30)	3 (21.43) (7.90)	0.076
20–40 min	13 (68.42) (34.20)	1 (5.26) (2.60)	2 (10.53) (5.30)	3 (15.79) (7.90)	
40–60 min	4 (100.00) (10.50)	0	0	0	
>60 min	0	0	0	1 (100.00) (2.60)	
Talk to someone on a regular basis outside of shifts					
Yes	4 (80.00) (10.50)	0	0	1 (20.00) (2.60)	0.334
No	17 (51.52) (44.70)	6 (18.18) (15.80)	4 (12.12) (10.50)	6 (18.18) (15.80)	

Abbreviations: PGY: postgraduate year.
*Notes: *Statistically significant at $p < 0.05$.*

TABLE 3. Association between psychological distress and shift-related factors.

Social factors	Psychological status, n (row %) (total %)				*p* value
	Likely to be well	Mild disorder	Moderate disorder	Severe disorder	
Number of shifts worked in last 4 weeks					
<12	4 (57.14) (10.53)	0	1 (14.29) (2.63)	2 (28.57) (5.26)	0.705
13–14	8 (61.54) (21.05)	1 (7.69) (2.63)	2 (15.38) (5.26)	2 (15.38) (5.26)	
15–16	6 (42.86) (15.79)	4 (28.57) (10.53)	1 (7.14) (2.63)	3 (21.43) (7.89)	
17–18	2 (66.67) (5.26)	1 (33.33) (2.63)	0	0	
≥19	1 (100.00) (2.63)	0	0	0	
Amount of time spent completing remaining shift-related work after shifts					
<15 min	1 (20.00) (2.63)	3 (60.00) (7.89)	1 (20.00) (2.63)	0	<0.001*
15 min to <1 h	16 (69.57) (42.10)	3 (13.04) (7.89)	3 (13.04) (7.89)	1 (4.35) (2.63)	
1–2 h	4 (40.00) (10.50)	0	0	6 (60.00) (15.79)	
>2 h	0	0	0	0	
Number of negative interactions (demeaning, belittling, verbal abuse, or harassment) with consulted teams in last 4 weeks					
Never	8 (88.89) (21.10)	0	0	1 (11.11) (2.63)	0.123
1–5 times	12 (44.44) (31.60)	6 (22.22) (15.80)	4 (14.81) (10.50)	5 (18.52) (13.20)	
6–10 times	0	0	0	0	
>10 times	1 (50.00) (2.63)	0	0	1 (50.00) (2.63)	
Number of negative interactions (demeaning, belittling, verbal harassment, or abuse) with team of physician-trainee colleagues** (residents, interns, medical students) in the last 4 weeks					
Never	19 (62.07) (48.65)	2 (6.90) (5.41)	4 (13.79) (10.81)	5 (17.24) (13.51)	0.022*
1–5 times	2 (25.00) (5.26)	4 (50.00) (10.53)	0	2 (25.00) (5.26)	
Number of negative interactions (demeaning, belittling, ignoring, verbal harassment or abuse) with emergency consultants*** in the last 4 weeks					
Never	12 (52.17) (31.60)	3 (13.04) (7.90)	3 (13.04) (7.90)	5 (21.74) (13.20)	0.459
1–5 times	9 (64.29) (23.70)	3 (21.43) (7.90)	1 (7.41) (2.60)	1 (7.41) (2.60)	
6–10 times	0	0	0	1 (100.00) (2.60)	
>10 times	0	0	0	0	
Number of patients who died under your care in the last 4 weeks					
0	13 (65.00) (34.20)	3 (15.00) (7.90)	2 (10.00) (5.30)	2 (10.00) (5.30)	0.110
1–2	3 (37.50) (7.90)	3 (37.50) (7.90)	1 (12.50) (2.60)	1 (12.50) (2.60)	
3–4	4 (80.00) (10.50)	0	1 (20.00) (2.60)	0	
≥5	1 (20.00) (2.63)	0	0	4 (80.00) (10.53)	

*Notes: *Statistically significant at $p < 0.05$.*
***colleagues in residency training; ***board-certified emergency physicians with at least 2 years of experience post residency training.*

TABLE 4. Correlation between K10 scores and factors related to the impact of shift-related problems.

Factors	Correlation coefficient	*p* value
Number of days the participant was totally unable to work, study or manage day-to-day activities due to distress.	0.524	0.052
Number of days the participant had to reduce work, study or perform daily activities.	0.702**	<0.001
Number of times the participant consulted another doctor/health care professional about feelings of distress.	0.332*	0.042

*Notes: *Correlations were significant at the 0.05 level (two-tailed). **Correlations were significant at the 0.01 level (two-tailed).*

TABLE 5. Multivariable proportional odds model.

Categories	B	Sig.	Exp (B)	95% Wald confidence interval for Exp (B)	
				Lower	Upper
Gender (Reference: Male)					
Female	2.114	0.019*	8.284	1.423	48.215
Negative interactions with your team of physician-trainee colleagues (residents, interns, medical students) in the last 4 weeks (Reference: 1–5 times)					
Never	−1.228	0.154	0.293	0.054	1.586
Reduced activities					
Number of days the participant had to reduce work, study or daily activities	0.456	0.021*	1.577	1.072	2.321
Days unable to work					
Number of days the participant was totally unable to work, study or manage day-to-day activities due to distress	0.192	0.285	1.212	0.852	1.722
Patient deaths					
Number of patients who died under the participant's care in the last 4 weeks	0.120	0.775	1.127	0.496	2.562
Number of consultations					
Number of times the participant consulted another doctor/health care professional about feelings of distress	−0.199	0.663	0.820	0.335	2.007
How much time spent completing remaining shift-related work after shifts (Reference: 1–2 h)					
<15 min	−1.113	0.265	0.329	0.046	2.322
15 min to <1 h	−2.238	0.009	0.107	0.020	0.570

*Notes: *p values reported were significant based on a significance level of 0.05.*
Abbreviations: B: beta coefficient; Sig: significance; Exp (B): exponentiated beta coefficient or odds ratio.

Regression analysis highlighted two significant variables, *i.e.*, gender and the number of days participants had to reduce work, study or daily activities due to the impact of shift-related problems. Females were found to be significantly more likely to experience severe psychological distress (OR 8.28; 95% CI: 1.423–48.215; $p < 0.05$). Moreover, participants who reduced their activities more frequently were also found to have a 1.58-fold increased likelihood of severe psychological distress ($p < 0.05$).

3.5 Multiple linear regression analysis

Multiple stepwise linear regression was also performed by taking the total score of psychological distress as a continuous outcome. The same two predictors were found to be independently associated with psychological distress, *i.e.*, gender and the number of days participants had to reduce work, study or other daily activities due to the impact of shift-related problems.

4. Discussion

This study shows a 44.74% prevalence of psychological distress ranging from mild to severe among the population of emergency medicine residents surveyed, with mostly females suffering from severe and statistically significant psychological distress. Training in emergency medicine is associated with potential psychological stressors that are thought to be due to the critical conditions of the presenting patients, the high rate of mortality, frequent incidences of violence, and poor individual and organizational support [25]. The prevalence of psychological distress reported in our study is similar to that reported in the published literature; a prevalence of 35% for depression in a large national survey of EM physicians in China [26] and as high as 80% reported among EM residents in another study conducted in Saudi Arabia [9]. This further contributes to the growing body of evidence of the magnitude of psychological distress in this at-risk population.

This study does not report any significant association between year of training and distress scores ($p = 0.456$). Data reported on this aspect has been conflicting. A prospective cross-sectional study comparing psychological stress, anxiety, depression and other factors in EM residents at the time of their induction in the residency program and three years afterward found a significant increase in the rates of anxiety and stress over time, highlighting a worsening trend of psychological distress as their residency progressed [27]. However, a significant decrease in overall stress levels measured by the K10 scale was reported with an increase in years of training among EM residents by another study [9].

Gender is a major determinant of psychological well-being. A large survey of emergency physicians during the COVID-19 pandemic showed significantly higher distress, concentration

problems and sleep disturbances among females [28]. Higher levels of female psychological distress and burnout during residency have been attributed to multiple factors, including promotion and wage disparities, gender bias and discrimination from colleagues and patients and poor social and organizational support [29]. Other reports have highlighted high burnout and posttraumatic stress disorder levels as well as lower compassion satisfaction scores among female emergency physicians [30].

We explored several other demographic factors in relation to their effect on psychological distress. The current literature reports a higher burnout prevalence among individuals who smoke [18, 31], those with low levels of physical exercise [32] and those who are married [18]. These factors did not significantly impact the psychological distress scores in our study, which could be due to our small sample size. Although it can be argued these factors may be a contributor to psychological distress, a counterargument is these factors are a result of psychological distress, this may be challenging to differentiate.

Work-related factors, including staying overtime to finish remaining tasks and experiencing negative interactions such as abuse or bullying from coworkers, were significant contributors to psychological distress in our study. Working overtime or for longer hours is a well-known contributor to psychological distress among general workers [33] as well as physicians [34]. Bullying, harassment, discrimination and abuse from colleagues or consultants are major factors contributing to junior doctor burnout and psychological distress [35, 36]. Indirect consequences of work-related factors also contribute to psychological distress, as identified in our study; having to reduce work, study or daily activities because of the negative impact of work-related factors emerged as an independent predictor of increased psychological distress, with 1.58 times effect size.

In addition to the need for whole-system strategies such as availability of resources, leadership involvement and support, hazard pay, being heard and having concerns addressed among others [37–39] to address psychological distress and burnout among healthcare providers, our study further highlights the need for individual- and community-level strategies to recognize and mitigate factors contributing to psychological distress in EM residents. This is an area of active research; a literature review of 8 interventional studies conducted in 2017 showed no significant improvement in the rates of wellness or burnout among emergency medicine residents after the introduction of various wellness interventions [40]. Wellness strategies can be employed at an individual level (such as encouraging mindfulness and positivity, improving sleep, exercise, nutrition and personal health and promoting an active life outside residency) as well as at a community level (mentorship and feedback, debriefing sessions, developing a culture of recognition and gratitude, and introducing wellness in residency curricula) [41]. Peer counseling plays an important role in promoting wellness, as shown in our study, where residents who talked to other health professionals about the impact of work problems on their daily lives were found to have significantly lower psychological distress levels.

5. Limitations

Our study has several limitations. The respondents were from a single residency program, which limits generalizability. The association of certain sociodemographic factors with psychological distress could not be ascertained due to low representation and the small sample size. We did not explore possible protective factors against psychological distress and burnout which may have led to an overestimation of distress in our study [42]. This study also did not account for other factors that have been shown to contribute to affect well-being among females such as wage disparities, gender bias and discrimination, poor social and organizational support, and microaggressions and harassment [43–45]. Future studies should also incorporate negative interactions with patients as possible stress-related factors. However, our study provides valuable information regarding the prevalence of psychological distress and its contributing factors among EM residents in Saudi Arabia, and future research should focus on interventions to mitigate psychological distress and improve wellness.

6. Conclusions

There is a high prevalence of varying degrees of psychological distress among emergency medicine residents with almost one fifth in our study population having a high likelihood of severe distress. Female gender and work-related problems that lead to a reduction in normal daily activities seem to correlate with the severity of psychological distress in EM residents. However, future research would need to account for a wider range of institutional, social and societal factors that may contribute to residents' likelihood of psychological distress. Nonetheless, it is essential for residents, mentors of residents, and residency program directors and personnel to understand reasons behind these factors, *i.e.*, negative interactions with colleagues and increased workload, and to strategize early identification and mitigation techniques to promote resident wellness.

AVAILABILITY OF DATA AND MATERIALS

The data are contained within this article.

AUTHOR CONTRIBUTIONS

TAAS, AA, MAG, ARB and AAAK—performed study concept and design, acquisition of data, interpretation of results and drafting of the manuscript. FFF—performed statistical analysis and interpretation of the data. All authors performed a critical revision of the manuscript and approved the final manuscript.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Approval was obtained from King Saud University's College of Medicine Institutional Review Board (approval no. E-22-7191) prior to the dissemination of the survey. Informed consent was obtained from each participant prior to survey

access, and participants had the option to withdraw at any time, including after survey submission.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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