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ORIGINAL RESEARCH

Mental Health Status of Medical Residents: A Cross-Sectional Study of Depression and Anxiety in a University Hospital

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ABSTRACT

This study aims to assess the severity of depressive and anxiety symptoms among medical residents in a university hospital and identify the factors associated with these symptoms. We expected depression and anxiety symptoms to be associated with working conditions, workplace relationships, and social functioning. This cross-sectional study included 283 medical residents at a university hospital who participated on a voluntary basis. Data were collected using the Beck Depression Inventory (BDI), the Beck Anxiety Inventory (BAI) and a structured sociodemographic data form designed by the researchers. Significantly higher BDI and BAI scores were associated with female gender (p<0.001) and current use of psychiatric medication (p=0.029 and p=0.027, respectively). Key stressors identified included seeing more than 30 patients per day, finding the number of shifts excessive, and perceived inability to participate in social activities. Furthermore, negative workplace experiences -including exposure to threats, lack of peer support, poor relationships with superiors, and feeling unappreciated- were strongly correlated with increased psychological distress. Other contributing factors were overall workplace dissatisfaction, the desire to specialize in a different field, inadequate physical conditions, and a bleak professional outlook for one's branch. Suicidal ideation during residency was specifically linked to higher depressive symptom severity (p<0.001). Lower professional experience and lower period of residency showed a significant negative correlation with anxiety scores (r=-0.177, p=0.003 and r=-0.146, p=0.014, respectively). In the adjusted regression models, female gender, fewer years of professional experience, current psychiatric medication use, and limited participation in social activities remained independently associated with higher BDI and BAI scores. These results suggest that severity of depressive and anxiety symptoms among resident physicians are closely related to modifiable occupational and environmental factors. Targeted interventions to improve these conditions are essential to support the mental well-being of physicians in training.

Key Words: Depression. Anxiety. Medical Resident. Working Condition. Suicide.

Asistan Hekimlerin Ruh Sağlığı Durumu: Bir Üniversite Hastanesinde Depresyon ve Anksiyete Üzerine Kesitsel Bir Çalışma

ÖZET

Bu çalışma, bir üniversite hastanesinde görev yapan asistan hekimlerin depresif belirti ve anksiyete belirti şiddetini değerlendirmeyi ve bu durumları etkileyen faktörleri saptamayı amaçlamaktadır. Depresyon ve anksiyete semptomlarının çalışma koşulları, iş yeri ilişkileri ve sosyal işlevsellik ile ilişkili olması beklenmiştir. Kesitsel tipteki bu araştırmaya, bir üniversite hastanesinde gönüllülük esasına göre katılan 283 asistan hekim dahil edilmiştir. Veriler; Beck Depresyon Envanteri (BDE), Beck Anksiyete Envanteri (BAE) ve araştırmacılar tarafından hazırlanan yapılandırılmış sosyodemografik veri formu aracılığıyla toplanmıştır. Anlamlı derecede yüksek BDE ve BAE puanları; kadın cinsiyet (p<0,001) ve aktif psikiyatrik ilaç kullanımı (sırasıyla p=0,029 ve p=0,027) ile ilişkili bulunmuştur. Belirlenen temel stresörler arasında günlük 30'dan fazla hasta muayenesi, nöbet sayısının aşırı bulunması ve sosyal aktivitelere katılım yetersizliği yer almaktadır. Ayrıca tehdide maruz kalma, akran desteği eksikliği, üstlerle zayıf ilişkiler ve takdir görmeme gibi olumsuz iş yeri deneyimleri, artan psikolojik sıkıntı ile güçlü korelasyon göstermiştir. İş memnuniyetsizliği, branş değişikliği isteği, yetersiz fiziksel koşullar ve mesleki geleceğe dair karamsarlık diğer katkıda bulunan faktörler olarak saptanmıştır. Uzmanlık eğitimi sırasında intihar düşüncesi varlığı yüksek BDI puanlarıyla ilişkili bulunurken (p<0,001); düşük mesleki tecrübe ve kıdem, BAI puanlarıyla anlamlı bir negatif korelasyon sergilemiştir (sırasıyla r=-0,177, p=0,003 ve r=-0,146, p=0,014). Uyarlanmış regresyon modellerinde, kadın cinsiyeti, daha az mesleki deneyim yılı, mevcut psikiyatrik ilaç kullanımı ve sosyal aktivitelere sınırlı katılım, hem BDI hem de BAI puanlarıyla bağımsız olarak ilişkili kalmıştır. Bu sonuçlar asistan hekimler arasındaki depresyon ve anksiyete düzeylerinin değiştirilebilir mesleki ve çevresel faktörlerle yakından ilişkili olduğunu düşündürmektedir. Bu koşulları iyileştirmeye yönelik hedefe yönelik müdahaleler, eğitim sürecindeki hekimlerin ruh sağlığını desteklemek adına elzemdir.

Anahtar Kelimeler: Depresyon. Anksiyete. Asistan Hekim. Çalışma Koşulları. İntihar.

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The healthcare sector is a demanding environment that imposes significant physical and psychological burdens on its workforce. Healthcare professionals are negatively affected by many factors, such as increased workloads, duties and responsibilities that include life threats, sleep deprivation, fear of malpractice, and the risk of disease transmission. Furthermore, time constraints and interpersonal conflicts within the workplace exacerbate these challenges. Such factors may compromise the psychological resilience of healthcare workers, potentially leading to anxiety, chronic stress, alcohol and substance use disorders, and depression. Ultimately, these issues not only impair the well-being of the staff but also threaten the quality and safety of patient care services[1-3].

In other Turkish national context, medical residency training is structured upon a traditional apprenticeship-based hierarchy. Within this framework, residents -occupying the entry-level positions- are subjected to heightened stress levels. This vulnerability stems from suboptimal working conditions, prolonged working hours, strenuous on-call shifts, workplace bullying (mobbing), and inadequate financial compensation[4].

Extensive research indicates that resident physicians experience a substantial burden of depressive symptoms. In a systematic review and meta-analysis of 54 studies including 17560 resident physicians, Mata et al. reported a pooled prevalence of depression or depressive symptoms of 28.8%[5]. Estimates ranged from 20.9% to 43.2% depending on the assessment instrument used, highlighting the methodological variability among studies[5]. These findings demonstrate that depressive symptoms are common during residency in training, although screening-based estimates should not be interpreted as the prevalence of clinically diagnosed depressive disorders.

Various studies further underscore this disparity. Caplan reported anxiety and depression frequencies of 29% and 27%, respectively, among physicians[6]. Specifically within university hospital settings, Demiral et al. identified depression in 27.4% and anxiety in 19.0% of the medical staff[7]. Studies focusing exclusively on resident physicians in Türkiye have yielded even more striking results, with depression rates ranging from 39.7% to as high as 50.7%[8-11]. These findings consistently highlight the profound mental health challenges faced by physicians during their specialist training.

In the literature, it is seen that topics such as depression, job satisfaction and burnout syndrome in healthcare professionals have been investigated[3,11,12]. Still, anxiety levels and affecting factors in assistant physicians have not been sufficiently examined. Therefore, in our study, we aimed to investigate the depression, anxiety levels and influencing factors of medical residents. This study suggests that depression and anxiety in resident doctors at a university hospital are linked to changeable factors. We predicted that stress would be associated with modifiable job and workplace conditions, and that some of these factors would still be significant after accounting for other influences.

Materials and Methods

Study Sample

This cross-sectional study was conducted between September 21, 2020, and December 21, 2020, among resident physicians at a university hospital. Ethical approval was obtained from the relevant ethics committee on September 02,2020 (Decision No: 2020-15/16). A total of 283 volunteers who met the inclusion criteria and provided informed consent were enrolled in the study. At the planning stage, the maximum number of potentially eligible resident physicians was estimated to be approximately 350. All accessible residents were invited to participate voluntarily, and 283 completed the study, representing 80.9% of the maximum anticipated sample. Since the exact number of eligible and invited residents could not be retrospectively verified, a formal response rate could not be calculated. Data collection was performed using a structured Sociodemographic Data Form, the Beck Depression Inventory (BDI) to assess depressive symptom severity, and the Beck Anxiety Inventory (BAI) to evaluate anxiety levels.

Psychiatric Assessment Scales

Sociodemographic Data Form: This comprehensive, self-reported form was designed to assess several dimensions of the participants' lives. It included demographic characteristics (age, gender, marital status, number of children, and living arrangements), socioeconomic factors (monthly income, satisfaction with the current city of residence, and frequency of social activities), and professional variables (specialty area, years of clinical experience, motivations for career choice, work schedules, and physical work environment). Furthermore, the form evaluated occupational stressors and well-being, such as interpersonal relationships in the workplace, job satisfaction, and history of exposure to workplace violence. Finally, clinical and lifestyle factors were documented, including perceived patient care outcomes, perceived family support, personal psychiatric history, and the use of tobacco, alcohol, or other substances.

Beck's Depression Inventory (BDI): Originally developed by Beck et al. in 1961, the BDI is a widely recognized instrument designed to assess the severity of depressive symptoms in both adolescents and adults[13]. The Turkish version of the scale was

validated for reliability and validity by Hisli in 1989[14]. The inventory evaluates the somatic, emotional, and cognitive components of depression. It consists of 21 items, each presented as a series of four statements corresponding to a score ranging from 0 to 3. While the BDI is frequently utilized as a self-report measure, it can also be administered by a clinician. Higher total scores on the inventory reflect an increase in the intensity of depressive symptomatology. Based on the Turkish validation study, a score of ≥17 was used as a screening threshold for depressive symptoms above the normal range. This cut-off was not considered diagnostic of depressive disorder.

Beck's Anxiety Inventory (BAI): Developed by Beck et al.[15], the BAI is a widely utilized self-report instrument designed to assess the severity of anxiety symptoms. The scale is particularly effective in distinguishing between the somatic symptoms of anxiety and subjective psychological distress. The reliability and validity of the Turkish version were established by Ulusoy et al.[16]. The inventory consists of 21 items, with total scores categorized as follows: 0–7 points (minimal anxiety), 8–15 points (mild anxiety), 16–25 points (moderate anxiety), and 26 points or higher (severe anxiety). Consistent with the inventory's design, higher total scores indicate a greater intensity of anxiety experienced by the respondent.

Statistical Analysis

Statistical analyses were performed using IBM SPSS Statistics for Windows, Version 22.0 (IBM Corp., Armonk, NY, USA). Mann-Whitney U was used for two independent group comparisons that did not have a normal distribution, and Kruskal Wallis tests were used for more than two independent group comparisons. Two-group comparisons were made using the Dunn-Bonferroni test in cases of significant differences. The Spearman Correlation Coefficient was used to examine the relationship between variables that did not have a normal distribution. Hierarchical multiple linear regression was used to find factors linked to depression and anxiety, controlling for other influences. Predictors were added in steps:

Model 1: Personal details (age, sex, experience, current psychiatric medication)

Model 2: Workload (patients seen, hours worked, shift burden perception)

Model 3: Work environment (conditions, satisfaction, supervisor relations, peer support)

Model 4: Social support (activities, income, satisfaction with city)

Model 5: Career outlook (considering leaving specialty or medicine)

Each model reported R^2, ΔR^2, β, B, SE, 95% CI, and p values. Multicollinearity was checked with VIFs (<5 accepted).

To determine the practical magnitude and clinical relevance of the regression models, Cohen's f^2 effect sizes were calculated for each block, with thresholds categorized as small (≥ 0.02), medium (≥ 0.15), and large (≥ 0.35).

For all analyses, a p-value of <0.05 was considered statistically significant.

Results

The doctors participating in our study were compared using various demographic factors, including gender, age, professional experience, and duration of service. The findings are presented in Table I.

Table I. Sociodemographic characteristics of the participants.

Characteristics		n (%) or Median (Min-Max)
Age (years)		28 (24-47)
Gender	Men	139 (49.1%)
	Women	144 (50.9%)
Marital status	Married	120 (42.4%)
	Single	163 (57.6%)
Children	No	233(82.3%)
	Yes	50 (17.7%)
Housing status	Rent	202 (71.4%)
	Other (Own/Family/Dorm)	81 (28.6%)
Perceived income	Insufficient	193 (68.1%)
	Sufficient	90 (31.9%)
Residential satisfaction	Dissatisfied	67 (23.6%)
	Satisfied	216 (76.4%)
Social Activity Engagement	No	231 (81.6%)
	Yes	52 (18.4%)

Seventy-one participants (25.1%) had a BDI score of ≥ 17, indicating elevated depressive symptoms according to the Turkish screening cut-off. Factors associated with depression and anxiety symptoms are presented in Table II. Female residents exhibited significantly higher BDI and BAI scores compared to their male colleagues (p<0.001). Regarding socioeconomic factors, insufficient income (p=0.034) and dissatisfaction with living in the current city (p=0.002) were significantly associated with higher BDI scores. Residents without children reported significantly higher BAI scores (p=0.027). Furthermore, participation in social activities was a critical factor; residents who were unable to participate in social events had significantly higher scores in both depression and anxiety inventories (p<0.001 for both).

Table II. Factors affecting depression and anxiety.

Factor		BDI Median (Min-Max)	*p* value	BAI Median (Min-Max)	*p* value
Gender	Men	9 (0-40)	**<0.001**	5 (0-45)	**<0.001**
	Women	12.5 (0-36)		9 (0-43)	
Marital status	Married	10 (0-36)	0.124	6 (0-41)	0.123
	Single	11 (0-40)		7 (0-45)	
Children	No	11 (0-40)	0.330	7 (0-45)	**0.027**
	Yes	10(0-36)		6 (0-30)	
Perceived income	Insufficient	11 (0-40)	**0.034**	7 (0-45)	0.712
	Sufficient	10 (0-36)		7 (0-39)	
Residential satisfaction	No	14 (0-36)	**0.002**	7 (0-38)	0.185
	Yes	10 (0-40)		7 (0-39)	
Social activity engagement	No	11 (0-40)	**<0.001**	7 (0-45)	**<0.001**
	Yes	6.5 (0-24)		2 (0-32)	

BDI: Beck Depression Inventory; BAI: Beck Anxiety Inventory. Bold font indicates statistical significance (p<0.050).

The relationship between individual characteristics and psychological distress is summarized in Table III. A history of suicidal ideation during residency was significantly associated with higher BDI scores (p<0.001). However, no significant associations were found between BDI or BAI scores and family support, chronic physical disease, prior psychiatric diagnosis, or history of suicide attempts (p>0.05). Similarly, smoking and alcohol consumption did not significantly influence scale scores in this study population.

Table III. Individual traits and habits associated with depression and anxiety.

Factor		BDI Median (Min-Max)	*p* value	BAI Median (Min-Max)	*p* value
Family support	No	12.5 (0-40)	0.105	9 (1-42)	0.130
	Yes	10 (0-35)		6 (0-45)	
Chronic disease	No	10 (0-40)	0.142	6.5 (0-45)	0.909
	Yes	12 (1-26)		7 (0-26)	
Psychiatric disease	No	11 (0-40)	0.236	6 (0-45)	0.093
	Yes	11 (1-32)		11.5 (0-38)	
Current use of psychiatric treatment	No	11 (0-40)	**0.029**	6 (0-45)	**0.027**
	Yes	12 (1-36)		10 (0-32)	
Suicidal thought	No	10 (0-36)	**<0.001**	6.5 (0-45)	0.068
	Yes	17 (3-40)		10 (0-42)	
Suicide attempt	No	11 (0-40)	0.858	7 (0-45)	0.365
	Yes	11 (3-26)		4 (2-7)	
Smoking and alcohol consumption	No	14 (0-34)	0.220	7 (0-33)	0.323
	Yes	10 (0-36)		6 (0-43)	

BDI: Beck Depression Inventory; BAI: Beck Anxiety Inventory. Bold font indicates statistical significance (p<0.050).

As shown in Table IV, several occupational factors were significantly associated with psychological distress. Residents who perceived their shift numbers as unacceptable, those examining more than 30 patients per day, and those reporting overall workplace dissatisfaction had significantly higher BDI and BAI scores (p<0.05).

Table IV. Occupational characteristics associated with depression and anxiety.

		BDI Median (Min-Max)	*p* value	BAI Median (Min-Max)	*p* value
Total working time in the profession	≤2 years	11 (0-40)	0.271	9.5 (0-42)	**0.034**
	>2 years	11 (0-36)		6 (0-45)	
Time worked as medical resident in the department	≤2 years	11 (0-40)	0.401	8 (0-45)	0.083
	>2 years	11 (0-32)		6 (0-43)	
Is your hospital shift count above acceptable levels?	No	9 (0-36)	**0.003**	6 (0-43)	**0.013**
	Yes	11.5 (0-40)		7 (0-45)	
Average number of patients examined per day	≤30	10 (0-30)	**0.003**	6 (0-45)	**0.006**
	>30	12 (0-40)		8 (0-43)	
Appreciation by patients	No	11 (0-40)	**<0.001**	7 (0-43)	0.274
	Yes	6.5 (0-24)		6 (0-45)	
Workplace satisfaction	No	13 (0-40)	**<0.001**	9 (0-43)	**<0.001**
	Yes	8 (0-30)		5 (0-45)	
Peer support	No	12 (0-40)	**0.001**	7 (0-43)	**0.026**
	Yes	9 (0-36)		6 (0-45)	
Clinical working conditions	Difficult	13 (0-40)	**<0.001**	7 (0-45)	**0.023**
	Easy-Medium	10 (0-36)		6 (0-41)	
Receiving threats from patients or patients' relatives	No	10 (0-36)	**0.014**	6 (0-45)	**0.003**
	Yes	11 (0-40)		8 (0-43)	
Future career outlook in the specialty	Optimistic	7.5 (0-40)	**<0.001**	5 (0-42)	**0.002**
	Pessimistic	13 (0-36)		8 (0-45)	
Poor relationships with superiors	No	10 (0-36)	**0.002**	6 (0-45)	**0.004**
	Yes	14 (0-40)		10 (0-42)	
Desire to change current specialty	No	10 (0-36)	**0.004**	6 (0-45)	**0.007**
	Yes	11 (0-40)		8 (0-43)	
Intention to leave residency training	No	9 (0-36)	**<0.001**	6 (0-45)	**<0.001**
	Yes	14 (0-40)		10.5 (0-43)	

BDI: Beck Depression Inventory; BAI: Beck Anxiety Inventory. Bold font indicates statistical significance (p<0.050).

Additionally, lower levels of peer support, difficult clinical working conditions, and a history of receiving threats from patients or their relatives were significantly linked to elevated BDI and BAI scores. Interestingly, while a lack of appreciation by patients was significantly associated only with higher BDI scores (p<0.001), shorter total working time in the profession (≤2years) was specifically associated with higher BAI scores (p=0.034).

The correlation analysis between working conditions and psychological scores is presented in Table V. Significant positive correlations were found between the average number of monthly shifts and daily working hours with both BDI and BAI scores (all p<0.001).

Table V. Correlation analysis between working conditions and psychological scores.

	BDI		BAI	
	r	*p*	*r*	*p*
Total working years in this profession	-0.042	0.479	-0.177	**0.003**
Time spent working as a medical resident in your department	-0.058	0.335	-0.146	**0.014**
Average number of shifts per month	0.169	**0.004**	0.202	**0.001**
Average daily working hours	0.160	**0.007**	0.192	**0.001**
Average number of patients seen per day	0.118	**0.049**	0.100	0.096

BDI: Beck Depression Inventory; BAI: Beck Anxiety Inventory. Bold font indicates statistical significance (p<0.050).

Table VI. Hierarchical multiple linear regression predicting depression (BDI) and anxiety (BAI) scores: model summary.

Model	Block (variables added)	R^2	ΔR^2	F Δ (p)	Model F (p)	Cohen's f^2
BDI (Depression)						
1	Individual characteristics	0.081	0.081	-	**5.90 (<0.001)**	**0.088**
2	+ Workload	0.135	0.054	**5.57 (0.001)**	**5.93 (<0.001)**	**0.062**
3	+ Workplace climate	0.232	0.097	**8.26 (<0.001)**	**7.19 (<0.001)**	**0.126**
4	+ Social resources	0.275	0.043	**5.12 (0.002)**	**7.01 (<0.001)**	**0.059**
5	+ Professional identity conflict	0.304	0.029	**5.31 (0.005)**	**7.00 (<0.001)**	**0.042**
BAI (Anxiety)						
1	Individual characteristics	0.092	0.092	-	**6.82 (<0.001)**	**0.101**
2	+ Workload	0.125	0.033	**3.33 (0.020)**	**5.42 (<0.001)**	**0.038**
3	+ Workplace climate	0.175	0.050	**3.98 (0.004)**	**5.05 (<0.001)**	**0.061**
4	+ Social resources	0.219	0.044	**4.90 (0.002)**	**5.20 (<0.001)**	**0.056**
5	+ Professional identity conflict	0.230	0.010	1.75 (0.176)	**4.79 (<0.001)**	**0.013**

BDI: Beck Depression Inventory; BAI: Beck Anxiety Inventory. N=274 (listwise deletion). Model 1: age, gender, total professional experience, current psychiatric medication use. Model 2: + patients examined per day, daily working hours, shift number perceived excessive. Model 3: + adequate physical conditions, workplace satisfaction, good relationship with superiors, adequate peer support. Model 4: + adequate participation in social activities, income perceived sufficient, satisfied with city of residence. Model 5: + considering leaving specialty, considering leaving medicine. Cohen's f^2 was calculated as the effect size metric for the regression blocks; values of ≥ 0.02, ≥ 0.15, and ≥ 0.35 represent small, medium, and large effect sizes, respectively.

Furthermore, BDI scores were positively correlated with the average number of patients seen daily (r=0.118, p=0.049). regarding Professional experience, BAI scores showed a significant negative correlation with both total years in the profession (r=-0.177, p=0.003) and time spent in the current department (r=-0.146, p=0.014).

To determine which variables remained independently associated with psychological distress after accounting for potential confounding, hierarchical multiple regression analyses were performed separately for depressive and anxiety symptoms. The final regression model explained 29.6% of the variance in depressive symptoms. After accounting for various factors, being female, using psychiatric medication, having less professional experience, fewer social activities, and considering leaving one's specialty were linked to higher BDI scores. Workplace factors that initially seemed important, like patient load and supervisor relationships, were no longer significant after adjustments, suggesting shared causes (Table VI).

For anxiety, the final model explained 22.2% of the variance. Being female, using psychiatric medication, having less professional experience, and fewer social activities were linked to higher BAI scores. Similar to depression, many workplace factors became insignificant after adjustments, indicating overlap in stressors (Table VI).

Discussion and Conclusion

This study investigated the severity of depressive and anxiety symptoms among resident physicians at a university hospital, with a specific focus on identifying the multifaceted factors influencing their psychological well-being. Our core hypothesis -that psychological distress in this population is significantly associated with modifiable occupational and sociodemographic conditions- was largely supported by the findings. By assessing 283 participants through the BDI and BAI, several critical stressors were identified, providing a framework for potential institutional interventions aimed at improving the mental health of residents.

Our findings show that modifiable sociodemographic and occupational factors strongly influence psychological distress. Being female and feeling financially insufficient predicted higher BDI scores, while less than two years of experience predicted higher BAI scores. Lack of social engagement was linked to both.

Occupational stressors were central. High workloads (many shifts, many patients, long hours) correlated with higher BDI and BAI. A poor work environment (tough conditions, low satisfaction, lack of support,

bad relationships with superiors) was also strongly linked to distress. External stressors like threats from patients or lack of appreciation worsened depressive symptoms. A negative career outlook, wanting to switch specialties, or considering leaving training also led to higher distress. Suicidal thoughts during residency were noted. Anxiety levels seemed highest early in training, potentially decreasing with experience.

The findings of the present study regarding the prevalence and severity of depressive symptoms are largely aligned with the existing literature. We observed a median BDI score of 11.85, which is slightly higher than the median score of 9 reported by Çete et al.[10]. Similarly, our results mirror the high depression rates identified by Başpınar et al. (49.5%) and Gören et al. (39.7%), underscoring a persistent and widespread mental health challenge among resident physicians[8,9].

A key finding in our study was the significant gender disparity, with the female residents exhibiting higher BDI and BAI scores than their male counterparts. This is consistent with several studies, such as those by Gören et al.[9] and Çeler et al.[17], which identified female gender as a significant risk factor for depressive symptoms. However, literature on this topic remains divided; for instance Şehitoğlu Alpağut et al.[11] and Başpınar et al.[8] reported no significant gender-based differences in depression rates. Our findings support the broader evidence summarized in a meta-analysis of 48 studies, which indicates that female gender, alongside intense job demands and poor work-life balance, nearly triples the likelihood of burnout and psychological stress among medical residents[18]. This suggests that while individual study results may vary, gender-specific stressors remain a critical component of the professional burden in medicine.

Regarding marital status, our study revealed no significant correlation with BDI scores, which aligns with previous findings in the literature[9-11]. Similarly, parental status -defined as the presence or absence of children- did not significantly influence depression scores in our cohort. This result is concordant with the study by Gören et al[9]. In contrast, Şehitoğlu Alpağut et al. reported a significant association between parenthood and depression levels, suggesting that the responsibilities of child-rearing may impact the psychological well-being of residents in different institutional contexts[11].

The results of the present study contribute to a more comprehensive understanding of the occupational and environmental determinants of depression among medical professionals. Our findings corroborate several prior reports indicating that workload-related stressors, such as excessive duty hours and high patient volume, are significant predictors of elevated depression and anxiety scores[9-11]. Furthermore, workplace culture and interpersonal dynamics - including job dissatisfaction, workplace intimidation, and poor relationships with superiors- emerged as critical factors in our cohort. These results are also consistent with literature highlighting the psychological toll of a negative future outlook and a lack of social engagement[9-11]. Conversely, while some studies suggest a link between substance use or chronic illness and mental health, our study observed no significant differences in BDI scores regarding these variables. This discrepancy may be attributed to the relatively low prevalence of chronic conditions in our specific sample or potential underreporting of substance use due to social desirability bias in a professional medical setting.

A notable finding in our study was the differential impact of the socioeconomic and environmental factors on depression versus anxiety. Specifically, residents who perceived their income as insufficient exhibited significantly higher BDI scores, whereas income levels did not appear to influence BAI scores. This association between financial dissatisfaction and depressive symptomatology is well-documented in the literature, reflecting the psychological strain of economic instability during residency[9,10]. Similarly, residential satisfaction -defined as being content with the city of residence- and the perceived adequacy of working conditions were significant predictors of lower BDI scores, yet these factors did not show a statistically significant relationship with anxiety levels. These results suggest that while environmental and financial stressors are potent drivers of depressive mood and sense of hopelessness, anxiety in the medical profession may be more closely tied to acute workload parameters and clinical responsibilities rather than general life satisfaction.

Our findings underscore that professional commitment and satisfaction with the chosen medical specialty are critical determinants of psychological well-being. Consistent with the literature[9,10], residents who did not choose their fields voluntarily, those expressing a desire to specialize in a different field, or those considering resigning from their current residency program exhibited significantly higher BDI scores. This suggests that a lack of vocational alignment may foster a sense of hopelessness and professional alienation, which are core components of depressive symptomatology. Interestingly, while total working time as a continuous variable did not show a significant linear correlation with BDI or BAI scores, categorical analysis revealed that residents in the early stages of their career (two years or less) reported significantly higher anxiety levels. This indicates that the initial phase of residency -marked by high clinical uncertainty and the process of professional adaptation- is particularly associated with acute anxiety, whereas

the desire to change or leave the specialty remains a potent stressor for both depression and anxiety throughout the training period.

The work environment impacts residents' health through physical, quantitative, and interpersonal aspects. High patient volume and perceived excessive shifts were linked to higher BDI and BAI scores. Lack of peer support, poor collaboration with superiors, and lack of appreciation also contributed to depression. Occupational safety concerns, like threats or poor physical conditions, led to higher distress. This aligns with research identifying heavy workload, poor faculty relationships, and unmet needs as primary stress drivers. Our data strongly corroborates the framework proposed by Ong et al., who identified heavy workload, poor relationships with faculty members, and unmet needs as the three primary catalysts for increased stress among residents[19]. This highlights that mitigating psychological morbidity requires not only a reduction in clinical hours but also an improvement in the relational and physical quality of the workplace.

Current psychiatric medication use and suicidal ideation were significant distress indicators. Residents on psychiatric medication had higher BDI and BAI scores, likely reflecting active conditions. Suicidal ideation was strongly linked to depression. A history of suicide attempts was not statistically significant, possibly due to low prevalence in our sample. Family support, chronic physical disease, past psychiatric illness, and habits like smoking or alcohol did not significantly influence scores, suggesting active psychological crises and current occupational stressors have a more immediate impact.

The hierarchical regression analyses revealed a key finding. While many workload and workplace factors initially correlated with depression and anxiety, these links weakened significantly after accounting for other variables. This suggests occupational stressors overlap, meaning interventions targeting just one factor might be less effective than broader organizational strategies.

From an organizational standpoint, focusing solely on reducing workload may not be enough. Workload-related factors, though initially linked to distress, showed less independent impact after considering workplace, social, and professional aspects. This highlights the need for comprehensive organizational approaches that integrate workload management with improvements in workplace atmosphere, supervisor support, social involvement, and professional growth.

Despite the comprehensive nature of this study, several limitations must be acknowledged. The reliance of self-reported data may introduce social desirability bias, and the single-center design potentially limits the generalizability of the findings to different institutional contexts. In addition, the exact number of eligible and invited resident physicians during the study period could not be retrospectively confirmed. Therefore, a formal response rate could not be calculated, and the possibility of selection and non-response bias cannot be excluded. Specialty-specific analyses could not be performed because the codebook linking anonymized specialty codes to the corresponding branches was unavailable. The BDI and BAI are self-report instruments that measure severity of depressive and anxiety symptoms, respectively, and do not establish clinical psychiatric diagnoses. Therefore, the findings should not be interpreted as estimates of the prevalence of depressive or anxiety disorders. Furthermore, the cross-sectional nature of the research precludes the establishment of definitive cause-and-effect relationships. Data was collected during late 2020, a peak time for the COVID-19 pandemic. This may have increased depression and anxiety in residents beyond normal levels. Consider this context when interpreting findings and comparing with other groups. Nevertheless, this study fills a significant gap in the literature, particularly regarding resident anxiety levels -an area often overshadowed by depression research. Our findings highlight that anxiety in this population is acutely sensitive to early-career uncertainties, excessive patient volumes, and workplace safety concerns.

These results collectively suggest that improving the psychological well-being of residents is not merely an individual responsibility but an institutional one. Implementing systemic changes -such as optimizing shift durations, ensuring workplace safety, and fostering transparent communication with seniors- is essential. By prioritizing these modifiable conditions, medical institutions can cultivate a more supportive environment that protects the mental health of medical residents while maintaining high standards of medical education.

This study concludes that depressive and anxiety symptoms among medical residents are significantly driven by modifiable occupational stressors, particularly high patient volumes, excessive shift counts, and suboptimal interpersonal support. Our findings highlight that psychological distress among resident doctors is not just an individual problem but a systemic issue tied to the workplace. This means residents' mental health is best understood not by looking at workload in isolation, but by considering the broader occupational and organizational environment. Addressing these modifiable conditions through institutional reforms -such as optimizing workloads and fostering a supportive professional culture- is essential for the mental well-being of residents. Prioritizing these interventions is critical to ensuring a sustainable healthcare workforce and maintaining the overall quality of medical education and patient care.

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