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General

Prevalence of Depression and Burnout among Family Medicine Residents in Riyadh City, Saudi Arabia

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Background

The mental health of healthcare workers, particularly family medicine residents, is an area of growing concern, more so in the context of the COVID-19 pandemic. High levels of burnout and depression among these professionals can affect their well-being and patients' quality of care.

Objectives

The study aimed to determine the prevalence of depression and burnout among family medicine residents in Riyadh, Saudi Arabia.

Materials and Methods

A cross-sectional study was conducted among 213 family medicine residents, using a self-administered survey. The survey included the Maslach Burnout Inventory and the Patient Health Questionnaire (PHQ)-9 to assess burnout and depression. Descriptive statistics were used to summarize participants' characteristics, and regression model was developed to explore predictors of burnout and depression.

Results

The mean age of participants was 26.85±1.42 years, and 53.3% were males. The study found a high prevalence of emotional exhaustion (EE) and depersonalization (DP) among participants, with mean scores of 21.10±9.38 and 15.44±7.69, respectively, indicating moderate to high levels. Similarly, a high level of personal accomplishment (PA) was reported, with a mean score of 11.46±6.33. Around 10% of participants reported moderately severe and severe depression, with a mean PHQ-9 scale score of 6.03±5.10. Gender and depression severity were significantly associated with burnout ($p=0.001$ and $p<0.001$, respectively).

Conclusion

The study underscores a significant prevalence of burnout and depression among family medicine residents in Riyadh, with notable variations across different demographic and professional characteristics. This necessitates tailored mental health interventions for this population, especially in challenging times like the ongoing pandemic.

1. INTRODUCTION

Burnout, as characterized by the World Health Organization (WHO) in the International Classification of Diseases (ICD-11), represents a syndrome emanating from unmanaged chronic workplace stress. It encompasses three dimensions: feelings of exhaustion or energy depletion, increased mental estrangement or negativism towards one's work, and diminished professional effectiveness.[1]

Medical practitioners, especially physicians, are susceptible to higher rates of burnout compared to their counterparts in other doctoral-level fields. Training periods have been identified as the pinnacle of distress for physicians.[2, 3] For instance, the Medscape Physician Burnout and Depression Report-2022 noted that 47% of US-based physicians showed signs of burnout.[4] Further, a meta-analysis documented a 35.7% burnout prevalence rate among medical residents, with local investigations reporting between 32% and 84.2% among family medicine residents.[5-7]

Burnout often coexists with destructive behaviors such as substance abuse, reduced quality of life, increased conflicts, and impaired relationships.[8] Furthermore, it is associated with mental health conditions including anxiety,

depression, sleep disturbances, and suicidal ideation.[9,10] Systematic reviews reveal that physicians experiencing burnout are twice as likely to contribute to patient safety incidents and deliver suboptimal patient care, contributing to lower patient satisfaction ratings and the compromised ability of healthcare systems to ensure high-quality, safe care.[11,12]

Depression, as delineated by the American Psychiatric Association, represents a significant negative affective state, manifesting as unhappiness and discontent to severe sadness, pessimism, and despondency, which interferes with daily functioning.[13] As a pervasive and severe medical illness, depression adversely influences feelings, thought processes, and actions.[14] It is a primary cause of global disability and a significant contributor to the worldwide disease burden.[15]

Resident physicians have been documented to exhibit higher depression rates compared to the general populace,[16-18] with reported depression prevalence or depressive symptoms ranging between 20.9% and 43.2%.[19] Among Saudi resident physicians, perceived stress is comparably high or slightly higher than global rates,[20] with regional studies showing depression prevalence from 57.3% to 75.8%.[21-23]

Depression is a leading cause of disability globally, matching other medical conditions such as diabetes, hypertension, and arthritis.[24] It is strongly associated with suicidal ideation and attempts,[25] and amongst resident physicians, is linked to increased medical errors and reduced patient care quality.[26]

Within the context of Saudi Arabia's Vision 2030, primary care has been emphasized as a pivotal aspect of healthcare, specifically through family practice and the concept of gatekeeping. The family medicine residency program has been adjusted to span three instead of four years, with the curriculum competencies drawn from various international and national frameworks, as well as the New Model of Care (MOC) aimed at achieving Saudi healthcare transformation by 2030.

Investing in the wellness and professional values of resident physicians, who will shoulder healthcare delivery in the coming decades, is essential for fostering organizational immunity against workforce shortages, patient harm, and mistrust. Hence, the current study focuses on exploring the prevalence of depression and burnout among family medicine residents.

2. MATERIALS AND METHODS

2.1. ETHICAL CONSIDERATIONS

This study received institutional review board approval from King Fahad Medical City, Riyadh, Saudi Arabia. Participant anonymity was preserved by excluding identifiers from the survey, and a consent form was collected alongside each survey.

2.2. STUDY DESIGN AND SETTING

This investigation utilizes a cross-sectional study design, executed in 2021, through the implementation of a self-administered survey among family medicine residents practicing in Riyadh, the capital of Saudi Arabia.

2.3. SAMPLE SELECTION AND SAMPLING TECHNIQUE

The sample incorporates family medicine residents in Riyadh. Stratified random sampling was used to ensure a representative sample across all residency program levels (R1-R3). Inclusion criteria consisted of family medicine residents in Riyadh willing to participate in the study. Conversely, exclusion criteria covered family medicine residents practicing outside Riyadh, senior registrars, consultants, residents with a history of mental disorders before the residency program, and those not willing to participate in the study.

2.4. DATA COLLECTION PROCEDURES AND TOOLS

The data collection process entailed a three-part survey:

PART 1: DEMOGRAPHICS

This part collected demographic data, including age, gender, residency level, marital status, presence of chronic medical conditions, and history of mental disorders.

PART 2: BURNOUT ASSESSMENT

This section incorporated the Maslach Burnout Inventory (MBI) questionnaire, developed by Maslach and Jackson in 1986.[1] This self-report questionnaire consists of 22 items assessing three subscales: Emotional Exhaustion (EE), Depersonalization (DP), and Personal Accomplishment (PA). Each participant rated their job-related feelings on a 0-6 scale, with "0" indicating "never" experiencing such feelings and "6" indicating "everyday" occurrences. Mean subscale scores were calculated, corresponding to low, moderate, or high levels of EE, DP, and PA based on established scoring guides.

PART 3: DEPRESSION ASSESSMENT

The third part utilized the Patient Health Questionnaire (PHQ)-9, a previously validated assessment instrument.[2] Responses were collected on a 4-point Likert scale, where "0" denotes "Not at all" and "3" indicates "Nearly every day." These scores were aggregated to classify the severity of depression among the participants.

2.5 STATISTICAL ANALYSIS

The study employed descriptive statistics to summarize the participants' characteristics and prevalence of burnout and depression (percentages, mean±SD). A correlation test was used to assess the relationship between depression and burnout. A regression model was developed to identify the

Table 1. Respondents' characteristics

		n (%)
Age (mean±SD)		26.85±1.42
	24-26	93 (43.7)
	> 26	120 (56.3)
Gender	Male	113 (53.3)
	Female	99 (46.7)
Residency level	R1	55 (25.8)
	R2	58 (27.2)
	R3	100 (46.9)
Marital Status	Single	168 (78.9)
	Married	44 (20.7)
	Widow/Divorced	1 (0.5)
Chronic Medical Conditions	Yes	17 (8.0)
	No	196 (92.0)

predictors of burnout and depression, considering a p-value of <0.05 as statistically significant.

3. RESULTS

A total of 213 family medicine residents participated in the study with a mean age of 26.85±1.42 years. More than half of the subjects were males 53.3% and aged > 26. Further details are shown in **Table 1**.

Slightly more than half and 18.3% of the respondents indicated a moderate level of EE. However, the family medicine residents' EE mean subscale score was 21.10±9.38 indicating moderate levels. The majority of the family medicine residents 71.4% reported a higher level of DP. The DP mean subscale score was 15.44±7.69 indicating a high level. Moreover, all family medicine residents showed high PA levels with a mean score of 11.46±6.33. About 10% of the family medicine residents reported moderately severe and severe depression; however, the mean PHQ-9 scale score was 6.03±5.10 indicating mild depression level among family medicine residents. **Table 2**

Table 3 displays the stratification between burnout and respondents' characteristics. The results showed that females have a significant (p=0.002) higher EE and significantly lower PA than males (p=0.033). Across the three domains of the MBI scale, the results showed a statistically significant difference (p **<0.001)** between the levels of depression. **Table 3**

A statistically significant difference was found between family medicine residents' gender and depression severity (p=0.001). **Table 4**

4. DISCUSSION

The global prevalence of burnout and depression among healthcare workers has been well documented and is a concern in many regions worldwide. The situation is particularly pertinent among resident physicians, as they operate under significant stress due to the nature of their work, long hours, and a rigorous training regimen.[27,28] The current study aimed to investigate the prevalence of depression and burnout among family medicine residents in Riyadh City, Saudi Arabia, specifically during the COVID-19 pandemic, a period marked by elevated stress and increased workload for healthcare workers.

The results of this study are noteworthy and contribute to the current understanding of burnout and depression among resident physicians, particularly during crisis periods such as the COVID-19 pandemic. The prevalence of burnout and depression among residents in the study was found to be substantial, consistent with previous research indicating high levels of burnout and depression among resident physicians worldwide.[28,29]

The higher emotional exhaustion (EE) in female residents observed in our study aligns with findings from previous studies that suggest women in medicine often report higher burnout rates than their male counterparts.[30,31] This discrepancy may be due to a multitude of factors including gender roles, career progression, or work-life balance.

Similarly, the lower personal achievement (PA) scores among females compared to males could reflect the gender disparities prevalent in the medical field.[32] This warrants further investigation, particularly into potential institutional and societal barriers that may contribute to these differences.

Our findings also showed that residents of all levels reported high levels of depersonalization (DP), and this did not significantly differ by residency level. This suggests that regardless of their experience or seniority, residents are equally likely to exhibit high DP. This aligns with prior literature highlighting the prevalence of burnout across various stages of medical training.[33]

Concerning age, our study did not find any significant association between age and the three domains of the MBI scale. This is an interesting finding given that prior research has suggested both younger[34] and older age[35] as risk

Table 2. Average scores of subscales of the MBI and PHQ-9

		mean±SD	n (%)
Burnout subscales (MBI)	**Emotional Exhaustion**		
	≤ 17 (Low-Level)		67 (31.5)
	18–29 (Moderate-Level)	21.10±9.38	107 (50.2)
	≥30 (High-Level)		39 (18.3)
	Depersonalization		
	≤ 5 (Low-Level)		20 (9.4)
	6–11 (Moderate-Level)	15.44±7.69	41 (19.2)
	≥12 (High-Level)		152 (71.4)
	Personal Achievement		
	≤ 33 (High-Level)		213 (100.0)
	34–39 (Moderate-Level)	11.46±6.33	0
	≥40 (Low-Level)		0
Depression Severity (PHQ-9)	None/minimal (0-4)		103 (48.4)
	Mild (5-9)		66 (31.0)
	Moderate (10-14)	6.03±5.10	22 (10.3)
	Moderately severe (15-19)		18 (8.5)
	Severe (20-27)		4 (1.9)

Table 3. Association between Burnout and Respondents' characteristics

		Emotional Exhaustion		**Depersonalization**		**personal achievement**	
		mean±SD	p-value	mean±SD	p-value	mean±SD	p-value
Age	24-26	21.87±9.22	0.294	16.03±7.43	0.324	11.97±6.19	0.309
	> 26	20.15±9.50		14.98±7.87		11.08±6.45	
Gender	Male	19.37±8.77	**0.002**	14.88±7.80	0.194	10.65±6.36	**0.033**
	Female	23.29±9.46		16.24±7.39		12.51±6.11	
Residency level	R1	20.91±10.41	0.185	16.1±8.21	0.160	12.07±6.41	0.319
	R2	19.38±6.98		13.79±6.38		10.41±5.94	
	R3	22.21±9.91		16.03±8.0		11.74±6.49	
Marital Status	Single	21.32±9.28	0.756	15.85±7.79	0.312	11.79±6.09	0.178
	Married	20.23±9.93		13.86±7.23		10.41±7.09	
	Widow/ Divorced	24.0*		15.0*		3.0*	
Chronic Medical Conditions	Yes	23.24±6.16	0.330	17.18±7.64	0.333	11.13±6.39	0.808
	No	20.92±9.59		15.29±7.69		11.82±5.82	
Depression Severity (PHQ-9)	None/ minimal	17.44±8.19	**<0.001**	12.88±6.96	**<0.001**	09.67±6.19	**<0.001**
	Mild	22.65±8.56		16.58±7.35		12.32±6.25	
	Moderate	25.41±10.04		17.23±7.38		12.41±5.60	
	Moderately severe	29.67±8.99		22.67±7.69		17.17±4.67	
	Severe	27.25±6.60		20.25±4.42		12.75±2.87	

factors for burnout. This discrepancy could be due to the relatively narrow age range of our study participants.

Furthermore, the association between burnout and marital status was not significant. This contrasts with previous studies which have identified marital status as a significant factor in burnout, often finding that being single or divorced is associated with higher levels of burnout.[36]

Table 4. Association between depression severity and respondents' characteristics

		None/ minimal	Mild	Moderate	Moderately severe	Severe	P-value
Age	24-26	39 (37.9)	29 (43.9)	13 (59.1)	11 (61.1)	1 (25.0)	0.176
	> 26	64 (62.1)	37 (56.1)	9 (40.9)	7 (38.9)	3 (75.0)	
Gender	Male	69 (67.6)	31 (47.0)	6 (27.3)	6 (33.3)	1 (25.0)	**0.001**
	Female	33 (32.4)	35 (53.0)	16 (72.7)	12 (66.7)	3 (75.0)	
Residency level	R1	25 (24.3)	12 (18.2)	8 (36.4)	8 (44.4)	2 (50.0)	0.302
	R2	28 (27.2)	22 (33.3)	4 (18.2)	4 (22.2)	0	
	R3	50 (48.5	32 (48.5)	10 (45.4)	6 (33.4)	2 (50.0)	
Marital Status	Single	77 (74.8)	53 (80.3)	20 (90.9)	14 (77.8)	4 (100.0)	0.076
	Married	26 (25.2)	13 (19.7)	1 (4.5)	4 (22.2)	0	
	Widow/ Divorced	0	0	1 (4.5)	0	0	
Chronic Medical Conditions	Yes	99 (96.1)	60 (90.9)	20 (90.9)	14 (77.8)	3 (75.0)	0.060
	No	4 (3.9)	6 (9.1)	2 (9.1)	4 (22.2)	1 (25.0)	

As anticipated, our study found a significant correlation between depression severity and all burnout domains. This correlation is well-established in the literature, highlighting that burnout and depression often coexist among healthcare professionals.[37]

Lastly, we found a statistically significant association between gender and depression severity, with females more likely to report depression. This is consistent with a large body of evidence indicating that women, including those in healthcare professions, are at a higher risk of depression.[38]

While the COVID-19 pandemic context may have amplified the reported rates of burnout and depression in our study, it is crucial to note that these issues are deeply rooted and pervasive in the medical community. Solutions necessitate long-term, systemic changes that include but are not limited to, adjusting workloads, providing mental health resources, and promoting a work culture that acknowledges and addresses mental health concerns without stigma. Further research in this field is paramount, particularly during and following periods of extreme stress such as a pandemic.

In light of these findings, there is an urgent need for effective strategies aimed at minimizing burnout and depression among family medicine residents. Such measures may include provision for regular mental health check-ups, peer support initiatives, stress management programs, and a reevaluation of the workload. Further, considering the gender differences found in burnout and depression severity, it is crucial to tailor these strategies to address the unique challenges faced by different genders. In addition, longitudinal studies are recommended to explore the evolution and causality of these symptoms throughout the residency program, as well as to evaluate the impact of the introduced countermeasures. With these proactive steps, we can help ensure the well-being of our family medicine residents, thereby contributing to better healthcare delivery in the long run.

There are several limitations to our study which should be taken into consideration when interpreting the results. Firstly, the study adopted a cross-sectional design which, although effective for gauging prevalence at a specific point in time, inherently cannot establish cause-effect relationships or assess temporal trends. Thus, it's challenging to deduce if the burnout and depression developed during the residency or if they were pre-existing conditions exacerbated by the residency. Secondly, the reliance on self-reported data may also have introduced bias, as participants could overestimate or underestimate their symptoms, leading to potential inaccuracies in the data collected. This is particularly relevant for burnout and depression, which can be influenced by individual interpretations and the stigma associated with mental health conditions. Lastly, the sampling bias may limit the generalizability of our findings. While a random stratified sampling technique was used, this was confined to Riyadh city. Hence, the findings may not be fully representative of family medicine residents in other regions of Saudi Arabia or other countries. This limitation restricts the generalizability of the study results and may affect their applicability to broader contexts.

5. CONCLUSION

In conclusion, the present study demonstrated a high prevalence of burnout and a significant occurrence of depressive symptoms among family medicine residents in Riyadh City, Saudi Arabia. Notably, the study identified specific demographic factors associated with these symptoms. The results are particularly important considering the COVID-19 pandemic context, which might have exacerbated the situation due to increased workload and stress. The emotional distress experienced by the family medicine residents is significant and underscores the importance of proactive measures to identify and address these issues within the medical residency framework.

AUTHOR'S CONTRIBUTION

Study design: AN and AB; methodology, AN, AB and IF; data collection, AN and AB; data analysis, IF and MT; writing-review and editing, AN, AB, MT and IF; supervision, IF and MT. All authors have approved the final version of the manuscript for submission.

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CONFLICT OF INTERESTS

All authors declare that they have no conflict of interest.

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REFERENCES

1. World Health Organization. Burn-out an "Occupational Phenomenon": International Classification of Diseases. Published 2019. Accessed June 22, 2022. https://www.who.int/news/item/28-05-2019-burn-out-an-occupational-phenomenon-international-classification-of-diseases

2. Shanafelt TD, Sinsky C, Dyrbye LN, Trockel M, West CP. Burnout among Physicians Compared with Individuals with a Professional or Doctoral Degree in a Field Outside of Medicine. *Mayo Clinic Proceedings*. 2019;94(3):549-551. doi:10.1016/j.mayocp.2018.11.035

3. Dyrbye LN, West CP, Satele D, et al. Burnout Among U.S. Medical Students, Residents, and Early Career Physicians Relative to the General U.S. Population. *Academic Medicine*. 2014;89(3):443-451. doi:10.1097/acm.0000000000000134

4. Medscape. 2022 Lifestyle: Burnout. Published 2022. Accessed June 22, 2022. https://www.medscape.com/slideshow/2022-lifestyle-burnout-6014664

5. Rodrigues H, Cobucci R, Oliveira A, et al. Burnout Syndrome among Medical Residents: A Systematic Review and Meta-Analysis. Junne FP, ed. *PLoS ONE*. 2018;13(11):e0206840. doi:10.1371/journal.pone.0206840

6. Aldubai SamiAR, Aljohani A, Alghamdi A, Alghamdi K, Ganasegeran K, Yenbaawi A. Prevalence and Associated Factors of Burnout among Family Medicine Residents in Al Madina, Saudi Arabia. *J Family Med Prim Care*. 2019;8(2):657. doi:10.4103/jfmpc.jfmpc_268_18

7. Nahar S, Al-Ghamdi M, Siddiqui A, Al-Saleem S. Burnout and its Correlates in Saudi Family Medicine Residents: An Observational Study from Aseer, Saudi Arabia. *J Family Med Prim Care*. 2021;10(5):1904. doi:10.4103/jfmpc.jfmpc_2146_20

8. Rothenberger DA. Physician Burnout and Well-Being: A Systematic Review and Framework for Action. *Diseases of the Colon & Rectum*. 2017;60(6):567-576. doi:10.1097/dcr.0000000000000844

9. Abdulla L, Al-Qahtani D, Al-Kuwari M. Prevalence and Determinants of Burnout Syndrome among Primary Healthcare Physicians in Qatar. *South African Family Practice*. 2011;53(4):380-383. doi:10.1080/20786204.2011.10874118

10. Shanafelt TD. Special Report: Suicidal Ideation among American Surgeons. *Arch Surg*. 2011;146(1):54. doi:10.1001/archsurg.2010.292

11. Panagioti M, Geraghty K, Johnson J, et al. Association between Physician Burnout and Patient Safety, Professionalism, and Patient Satisfaction: a Systematic Review and Meta-Analysis. *JAMA Intern Med*. 2018;178(10):1317. doi:10.1001/jamainternmed.2018.3713

12. Garcia C, Abreu L, Ramos J, et al. Influence of Burnout on Patient Safety: Systematic Review and Meta-Analysis. *Medicina*. 2019;55(9):553. doi:10.3390/medicina55090553

13. American Psychological Association. APA Dictionary of Psychology. Published 2014. Accessed June 22, 2022. https://dictionary.apa.org/depression

14. Torres F. What Is Depression? *American Psychiatric Association*. Published online 2020. https://psychiatry.org/patients-families/depression/what-is-depression

15. World Health Organization. Depression. Published 2021. https://www.who.int/news-room/fact-sheets/detail/depression

16. Dyrbye LN, Thomas MR, Shanafelt TD. Systematic Review of Depression, Anxiety, and Other Indicators of Psychological Distress Among U.S. and Canadian Medical Students. *Acad Med*. 2006;81(4):354-373. doi:10.1097/00001888-200604000-00009

17. Sen S, Kranzler HR, Krystal JH, et al. A Prospective Cohort Study Investigating Factors Associated with Depression During Medical Internship. *Arch Gen Psychiatry*. 2010;67(6):557. doi:10.1001/archgenpsychiatry.2010.41

18. Mousa OY, Dhamoon MS, Lander S, Dhamoon AS. The MD Blues: Under-Recognized Depression and Anxiety in Medical Trainees. *PLoS ONE*. 2016;11(6):e0156554. doi:10.1371/journal.pone.0156554

19. Mata DA, Ramos MA, Bansal N, et al. Prevalence of Depression and Depressive Symptoms among Resident Physicians: A Systematic Review and Meta-Analysis. *JAMA*. 2015;314(22):2373. doi:10.1001/jama.2015.15845

20. Alosaimi FD, Kazim SN, Almufleh AS, Aladwani BS, Alsubaie AS. Prevalence of Stress and its Determinants among Residents in Saudi Arabia. *Saudi Med J*. 2015;36(5):605-612. doi:10.15537/smj.2015.5.10814

21. Al-Dubai SAR et al. Factors Associated with Stress and Depression among Family Medicine Residents in Al Madinah, Saudi Arabia. *Age*. 2021;25(27):10.

22. Al-Maddah EM et al. Prevalence of Sleep Deprivation and Relation with Depressive Symptoms among Medical Residents in King Fahd University Hospital, Saudi Arabia. *Sultan Qaboos Univ Med J*. 2015;15(1):78.

23. Alshardi A, Farahat F. Prevalence and Predictors of Depression among Medical Residents in Western Saudi Arabia. *J Clin Psychol Med Settings*. 2019;27(4):746-752. doi:10.1007/s10880-019-09667-7

24. Lecrubier Y. The Burden of Depression and Anxiety in General Medicine. *J Clin Psychiatry*. 2001;62:4-11.

25. Brådvik L. Suicide Risk and Mental Disorders. *Int J Environ Res Public Health*. 2018;15(9):2028. doi:10.3390/ijerph15092028

26. Brunsberg KA, Landrigan CP, Garcia BM, et al. Association of Pediatric Resident Physician Depression and Burnout with Harmful Medical Errors on Inpatient Services. *Acad Med*. 2019;94(8):1150-1156. doi:10.1097/acm.0000000000002778

27. Al Khashan H, Abogazalah F, Alomary S, et al. Primary health care reform in Saudi Arabia: progress, challenges and prospects. *East Mediterr Health J*. 2021;27(10):1016-1026. doi:10.26719/emhj.21.042

28. Pokhrel NB, Khadayat R, Tulachan P. Depression, Anxiety, and Burnout among Medical Students and Residents of a Medical School in Nepal: A Cross-sectional Study. *BMC Psychiatry*. 2020;20(1):137. doi:10.1186/s12888-020-02645-6

29. Abdulla L et al. Depression, Anxiety and Stress among First Year Medical Students in a Tertiary Institution in Saudi Arabia. *Asian J Psychiatr*. 2019;41:99-102.

30. Faheem D et al. Prevalence and Severity of Depression among Medical Undergraduates in Al Madina, Saudi Arabia. *J Taibah Univ Med Sci*. 2019;14(4):335-340.

31. Dewa CS et al. *Physician Mental Health and Well-Being: Research and Practice*. Springer; 2017.

32. World Health Organization. International Statistical Classification of Diseases and Related Health Problems (11th Revision. Published 2018. Accessed June 22, 2022. https://icd.who.int/browse11/l-m/en

33. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)*. American Psychiatric Association; 2013. doi:10.1176/appi.books.9780890425596

34. Rotenstein LS, Torre M, Ramos MA, et al. Prevalence of Burnout among Physicians: A Systematic Review. *JAMA*. 2018;320(11):1131. doi:10.1001/jama.2018.12777

35. Rotenstein LS, Ramos MA, Torre M, et al. Prevalence of Depression, Depressive Symptoms, and Suicidal Ideation among Medical Students: A Systematic Review and Meta-Analysis. *JAMA*. 2016;316(21):2214. doi:10.1001/jama.2016.17324

36. Dyrbye LN et al. Burnout and Professional Satisfaction with Work-Life Integration among US Physicians in Specialties at High Risk for Burnout. *Mayo Clin Proc*. 2019;94(4):549-571.

37. Ey S et al. If You Build It, They Will Come: Attitudes of Medical Residents and Fellows about Seeking Services in a Resident Wellness Program. *J Grad Med Educ*. 2017;9(5):600.

38. Dyrbye L, Shanafelt T. A Narrative Review on Burnout Experienced by Medical Students and Residents. *Med Educ*. 2015;50(1):132-149. doi:10.1111/medu.12927