Elmadhoun, W. et. al, Yemeni J Med Sci. 2025; 19(11):29 -37
https://doi.org/10.20428/yjms.v19i11.3208
https://journals.ust.edu/index.php/yjms

OPEN ACCESS Original Article

Work-Related Stress: Prevalence and Risk Factors among Healthcare Workers in Aden, Yemen

Hana Bashraheel[1], Asalah Maher[1], Faeda Mohammed[1], Noorh Al-Jabri[1], Naema Al-Yafai[1], Aya Al-Koni[1], Samia Farea'a[1], Malak Al-Qadasi[1], Waged Nadem[1], Gamala Al-Bayadani[1], Safa Al-Sarori[1], Aya Al-Zuriki[1], Raghda Khaled[1], Wadie Elmadhoun[1]*

[1] *Department of Basic Medical Sciences, Faculty of Medicine and Health Sciences, University of Science and Technology, Aden, Yemen*

ABSTRACT

Background: Work-related stress (WRS) is a common problem among healthcare workers (HCWs). This condition is associated with less productivity and serious consequences for patients.
Objective: The aim of this study was to find out the prevalence and risk factors for work-related stress among HCWs in Aden in 2025.
Methods: A descriptive, cross-sectional, health-facility-based study was conducted. Participants were recruited from public as well as private institutions. A standardized self-administered questionnaire was distributed to gather relevant study data that included sociodemographics and indicators of stress; scoring of severity was based on predetermined criteria. Statistical analysis was conducted using SPSS v26.
Results: All participants reported some level of work-related stress, with 76 (58.5%) experiencing moderate stress and 52 (40.0%) severe stress. The most common associated risk factors were gender, work environment, specialty, duration of experience, marital status, and perceived psychological health. However, there were no statistically significant risk factors except the self-perceived psychological health (p=0.01).
Conclusion: Work-related stress is common among health professionals in Aden. Mitigating policies are needed to address this problem.

Keywords: work-related stress, healthcare professionals, occupational health, Aden, Yemen.

**** Corresponding author address:*** *wadie2222@gmail.com*

https://doi.org/10.20428/yjms.v19i11.3208
https://journals.ust.edu/index.php/yjms

INTRODUCTION

Work-related stress (WRS) among healthcare professionals is increasingly recognized as a major concern, especially in low-resource settings. There are many factors contributing to WRS, including long working hours, high patient loads, emotionally charged situations, and insufficient institutional support (1,2). The World Health Organization (WHO) has recognized occupational stress as a major public health issue, particularly in critical care and emergency settings (3).

In conflict-affected countries such as Yemen, the situation is further aggravated by political instability, economic difficulties, and a fragile health infrastructure (4, 5). Prolonged exposure to instability, resource scarcity, poor working conditions, and security threats places HCWs at increased risk for burnout, mental health disorders, and diminished job performance (5, 6). Social media dependency is also a major contributor; overuse of digital devices has been linked with anxiety, stress, and social withdrawal (7).

Although WRS among healthcare professionals has widely been studied globally and regionally, considering contextual factors is crucial for determining the intensity and range of manifestations (1-9). Despite the availability of an extensive body of research, there is a noticeable lack of studies focusing specifically on Aden, Yemen, a region where healthcare workers (HCWs) face particularly complex and challenging conditions. In light of these challenges, this study aimed to assess the prevalence of WRS among HCWs in health facilities and to identify the key demographic, professional, and environmental factors contributing to it.

METHODS

Study design

A descriptive, cross-sectional, health facility-based study was conducted.

Sample size and population

Health-care workers were recruited from hospitals, health centers, pharmacies, dentist clinics, and academic institutions. The study was conducted in the period from February through April 2025. One hundred fifty HCWs volunteered to participate; however, only 130 respondents were included; the others were rejected due to information adequacy issues, as they lacked essential needed information.

Sampling Technique

A purposive convenience approach was used to recruit volunteers because there were no formal statistics about healthcare professionals. In addition, some institutions didn't give permission for investigators to carry on.

Data Collection

A pre-tested, standardized, self-administered questionnaire was used to collect socio-demographic data, workload and job demand, burnout, stress related to patients, life-work balance, psychological symptoms and general well-being, and the self-perceived assessment. A validated scoring system was used to categorize groups.

Data Analysis

Data was analyzed through Statistical Package for the Social Sciences software, version 26 (IBM, Chicago, IL, USA). Descriptive statistics were used, and a p-value of .05 or less was considered for significance.

Ethical Considerations

An ethical approval was obtained from the IRB of the University of Science and Technology, as well as written permissions from participating institutions and an informed consent from each participant. The voluntary nature of the study was explained, and the social value was clarified to participants.

RESULTS

The study included 130 healthcare workers; 66 were females (50.8%), the most common age group was 20-29 years (46.9%), and 46.9% of participants were single. Moreover, the largest group of participants were physicians (29.2%), followed by dentists (12.3%), and 53.1% of the participants had greater than 5 years of work experience, and the majority (64.6%) were working in hospitals; more details are displayed in Table 1. All participants reported some degree of work-related stress: 76 (58.5%) moderate and 52 (40.0%) severe (Figure 1).

https://doi.org/10.20428/yjms.v19i11.3208
https://journals.ust.edu/index.php/yjms

Table 1: The socio-demographic characteristics of participant healthcare workers in Aden, Yemen 2025, (n=130)

Item	Description	Frequency	Percentage (%)
Sex	Male	64	49.2
	Female	66	50.8
Age Group	20-29	61	46.9
	30-39	38	29.2
	40-49	19	14.6
	50-59	12	9.2
Marital Status	Single	61	46.9
	Married	59	45.4
	Divorced	8	6.2
	Widowed	2	1.5
Specialty	Physician	38	29.2
	Physician assistant	12	9.2
	Dentist	16	12.3
	Laboratory doctor	15	11.5
	Pharmacist	13	10.0
	Radiologist	5	3.8
	Nursing	13	10.0
	Midwife	5	3.8
	Technician	9	6.9
	Others: Psychologist, Nutritionist, Academician	4	3.1
Work Experience	Less than 5 yr	61	46.9
	5-10 yr	41	31.5
	11-20yr	17	13.1
	Above 20yr	11	8.5
Work Environment	Hospital	84	64.6
	Clinic	14	10.8
	Health Centre	6	4.6
	Academic institution	23	17.7
	Other	3	2.3

https://doi.org/10.20428/yjms.v19i11.3208
https://journals.ust.edu/index.php/yjms

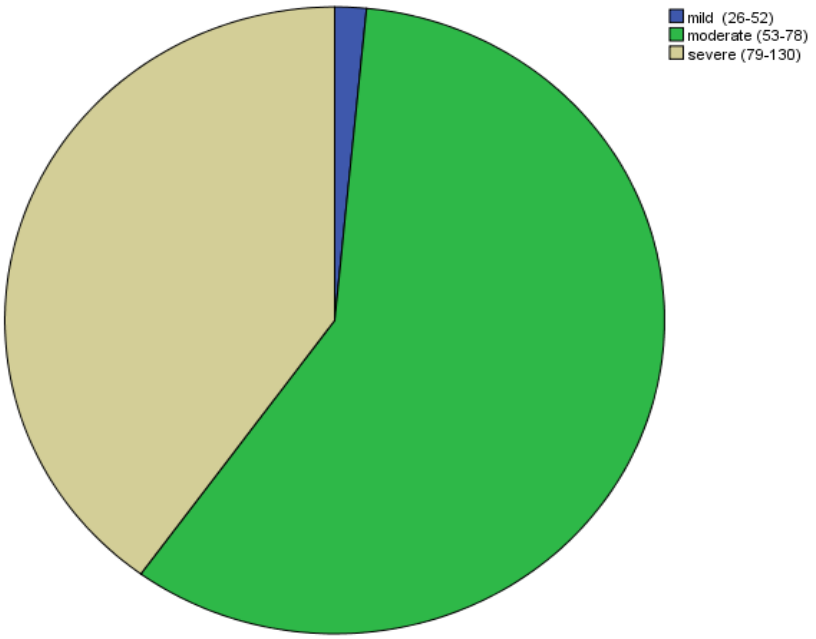

Figure 1: Frequency of stress level among healthcare workers in Aden, Yemen 2025, (n=130)

The analysis explored the association between stress levels and key sociodemographic characteristics of healthcare workers. Overall, the majority of participants experienced moderate stress, while fewer reported mild or severe levels across different variables. Regarding sex, both male and female participants demonstrated similar distributions of moderate and severe stress levels (p=0.98), indicating no statistically significant association between gender and stress level.

In terms of the work environment, healthcare workers employed in hospitals exhibited the highest proportion of moderate stress (56.0%), followed by those working in academic foundations (73.9%), whereas those in clinics and health centers showed slightly higher proportions of severe stress (57.1% and 50.0%, respectively). However, the differences were not statistically significant (p=0.51).

When comparing specialties or professions, physicians and other healthcare professionals such as dentists, pharmacists, radiologists, and nurses predominantly reported moderate stress levels, while physician assistants demonstrated a relatively higher proportion of severe stress (58.3%). Nevertheless, the association between profession and stress level did not reach statistical significance (p=0.78).

For years of experience, participants with less than 5 years of experience showed a slightly higher prevalence of moderate stress (60.7%), whereas those with 5–10 years reported higher severe stress (48.8%). Participants with over 20 years of experience reported predominantly mild or moderate stress levels (p=0.36). This suggests that more experienced workers may have developed better coping mechanisms, although the relationship was not statistically significant. In addition, for marital status, both single and married participants exhibited similar patterns of moderate stress, while divorced participants had the highest proportion of severe stress (62.5%). Despite these variations, the association between marital status and stress level was also statistically insignificant (p=0.64) (Table 2).

https://doi.org/10.20428/yjms.v19i11.3208
https://journals.ust.edu/index.php/yjms

Table 2: The relationships between the stress level and sociodemographic variables among participant of healthcare workers in Aden, Yemen 2025, (n=130)

		Level of stress			p value
Characteristic	Variable	Mild n(%)	Moderate n(%)	Severe n(%)	
Sex	Male	1(1.6%)	38(59.4%)	25(39.1%)	0.98
	Female	1(1.5%)	38(57.6%)	27(40.9%)	
Work environment	Hospital	2(2.4%)	47(56.0%)	35(41.7%)	0.51
	Clinic	0(0.0%)	6(42.9%)	8(57.1%)	
	Health Centre	0(0.0%)	3(50.0%)	3(50.0%)	
	Academic Foundation	0(0.0%)	17(73.9%)	6(26.1%)	
	Physician	0(0.0%)	26(68.4%)	12(31.6%)	
Specialty/profession	Physician assistant	1(8.3%)	4(33.3%)	7(58.3%)	0.78
	Dentist	0(0.0%)	9(69.2%)	7(30.8%)	
	Laboratory doctor	0(0.0%)	9(69.2%)	7(30.8%)	
	Pharmacist	0(0.0%)	9(69.2%)	7(30.8%)	
	Radiologist	0(0.0%)	9(69.2%)	7(30.8%)	
	Nursing	0(0.0%)	9(69.2%)	7(30.8%)	
	Midwife	0(0.0%)	9(69.2%)	7(30.8%)	
	Technician	0(0.0%)	5(55.6%)	4(44.4%)	
	Others: psychologist, nutritionist, academia	0(0.0%)	12(63.2%)	7(36.8%)	
	Less than 5 years	1(1.6%)	37(60.7%)	23(37.7%)	
Experience in years	5-10	0(0.0%)	21(51.2%)	20(48.8%)	0.36
	11-20	1(5.9%)	9(52.9%)	7(41.2%)	
	More than 20	0(0.0%0	9(81.8%)	2(18.2%)	
	Single	2(3.28%)	35(57.4%)	24(39.3%)	
Marital status	Married	0(0.0%)	37(62.7%)	22(37.3%)	0.64
	Divorced	0(0.0%)	3(37.5%)	5(62.5%)	
	Widowed	0(0.0%)	1(50%)	1(50%)	

Table 3 presents the association between the level of stress and self-perceived psychological health among healthcare workers. The results indicate a statistically significant relationship between these two variables (p=0.010), suggesting that psychological health perception is meaningfully linked to stress intensity. Participants who rated their psychological health as weak reported the highest proportion of severe stress (66.7%), with no cases of mild stress. Similarly, those with average psychological health showed a predominance of severe stress (68.8%) compared to moderate stress (31.2%), indicating that poorer self-perceived mental well-being is strongly associated with higher stress levels. Conversely, participants who described their psychological health as excellent demonstrated a markedly different pattern: 68.1% experienced moderate stress, 29.8% severe stress, and only 2.1% mild stress. This suggests that individuals with better perceived psychological health tend to report lower levels of severe stress.

https://doi.org/10.20428/yjms.v19i11.3208
https://journals.ust.edu/index.php/yjms

Table 3: The relationship between stress level and self-perceived psychological health among participant healthcare workers in Aden, Yemen 2025 (n=119)

		Level of stress			p value
Characteristic	Variable	Mild n(%)	Moderate n(%)	Severe n(%)	0.010
Self-perceived psychological health	weak	0(0.0%)	1(33.3%)	2(66.7%)	
	Average	0(0.0%)	10(31.2%)	22(68.8%)	
	Excellent	2(2.1%)	54(68.1%)	28(29,8%)	

DISCUSSION

Healthcare work inherently demands emotional resilience, high-stakes decision-making, and continuous exposure to trauma and suffering, even under stable conditions (1,2). In fragile settings like Aden, these demands are exacerbated by delayed salaries, inadequate staffing, lack of medical supplies, poor infrastructure including frequent power outages, and communication breakdowns (5-8). Evidence from Brazil, Ethiopia, Saudi Arabia, and Syria has consistently highlighted how institutional weaknesses, unclear job roles, and exposure to violence or trauma elevate stress levels among healthcare workers. 1–8 Therefore, understanding the specific stressors faced by healthcare providers in Aden is crucial to developing targeted support strategies and ensuring the sustainability of healthcare delivery in such a challenging environment.

All participants in this study expressed some degree of WRS. It's well documented that there is wide variation in prevalence of and contributing factors for occupational stress among healthcare professionals across diverse healthcare systems, geographies, and professional roles. In Saudi Arabia, it was found that over 60% of healthcare workers experienced moderate to severe occupational stress, often associated with night shifts, unclear job roles, and lack of professional recognition. Inadequate staffing and poor work-life balance were major stressors (2, 3).

This study showed that more than half of HCWs have moderate stress levels, similar to that reported from Saudi Arabia (3,9). However, the severe stress among HCWs in Aden is nearly two-fold that in Saudi Arabia (2,9). This highlights the particularly challenging circumstances faced by HCWs in Aden, likely due to the unstable environment's cumulative impact, e.g., delayed salaries, lack of supplies, infrastructure issues, structural inefficiencies and poor management [1], resource shortages, low remuneration, psychological distress [6, 8], lack of professional development opportunities, and workplace violence on resident doctors [5].

Although not statistically significant, severe stress was more prevalent among females, a finding that is similar to that in Ethiopia and Saudi Arabia (6,9). The explanation for this finding may include cultural norms and workplace environment. Interestingly, single individuals showed a higher level of stress when compared to married, which may reflect that the overall instability and hardship create a uniform stress level, or that typical marital support systems help mitigate stress in Aden's challenging environment, which is different from Ethiopia, where married workers had higher stress levels (4).

In this study, the specialties manifesting the highest levels of moderate to severe stress levels were midwives, physicians, and nurses, similar to the situation in Saudi Arabia (2), Ethiopia (6), Egypt (10), and Iran (11). The study in Iran emphasized that the psychological aspect affected the nurses more than the physical workload (10). This consistency across different contexts highlights the inherent stressors within these roles, often due to high workload, long working hours, and lack of psychological support (10).

It is obvious in this study that participants who rated their psychological self-perception as excellent were the least to suffer severe WRS. This finding brings into the light the debate on whether stress predominantly arises from individual vulnerabilities (9) or the other claim that stress is mainly attributable to organizational failures (12-14). Another layer of complexity is added by the cultural stigma surrounding mental health in many societies, which can discourage reporting and impede institutional responses, thus perpetuating under-addressed occupational stress among healthcare professionals.

https://doi.org/10.20428/yjms.v19i11.3208
https://journals.ust.edu/index.php/yjms

Healthcare workers in Aden operate under extreme conditions marked by political instability, economic hardship, resource scarcity, and security threats, which exacerbate their occupational stress. The absence of context-specific data hampers the development of targeted interventions and policies to mitigate stress and support healthcare professionals in this region. Without a clear understanding of the prevalence, determinants, and impacts of occupational stress among healthcare workers in Aden, efforts to sustain healthcare delivery and protect the mental health of providers remain insufficient and inadequately informed. Addressing these gaps is essential to designing effective, sustainable, and culturally sensitive interventions that can improve the well-being of healthcare workers operating in high-risk environments.

Additionally, intervention strategies remain a topic of concern. While some advocate for personal stress management programs aimed at enhancing resilience, others emphasize the need for systemic reforms, including the improvement of working conditions and better allocation of resources (3, 8, 15, 16).

This study had many limitations during sample selection and data collection, as the institutes in question refused to provide the total amount of workers, few institutes agreed to participate but under the condition that their name is not mentioned, andsome institutes refused to participate in the study at all. This scarcity limits the ability to design effective, context-specific interventions. The whole list of factors contributing to stress were not included in this preliminary, non-funded survey, such as workload, working hours, and psychological support. Despite these limitations, the findings of this study might prove valuable both academically and practically. Academically, it fills a gap by providing data on occupational stress among healthcare workers in Aden, Yemen, a conflict-affected and under-researched area with limited studies. Simply because most existing studies about WRS are conducted in stable settings, making this research uniquely valuable. Future research should expand to larger and more diverse samples, employ longitudinal designs to assess long-term impacts, and incorporate qualitative methods to capture the lived experiences of healthcare workers in fragile contexts.

CONCLUSION

This study demonstrates that work-related stress is highly prevalent among healthcare workers in Aden, particularly among midwives, nurses, and physician assistants. Self-perceived psychological health strongly influenced stress levels. Targeted interventions—including workplace support, mental health services, and organizational reforms—are urgently needed to reduce occupational stress and safeguard healthcare delivery in conflict-affected settings.

Recommendations

This study highlights the urgent need for multi-level interventions to mitigate work-related stress among healthcare workers in Aden. First, confidential and accessible mental health and psychosocial support services, including counselling and peer-support groups, should be established to address the high psychological burden (1, 2). Second, organizational reforms such as improved staffing, protected rest, and participatory workflow adjustments are essential to reduce workload and prevent burnout (3). Third, structured peer-support and supervision mechanisms can strengthen coping and decrease professional isolation, particularly among midwives, nurses, and physician assistants (2,4). Fourth, integrating routine mental health screening, monitoring, and resilience-building programs into occupational health systems would allow early detection and targeted support (3,5). Finally, aligning workplace measures with national strategies and ensuring safety, salary continuity, and supply availability are critical to sustaining healthcare delivery in conflict-affected settings (1, 5).

Acknowledgement

The authors express their sincere gratitude to the participating institutions and individuals whose contributions were essential to the completion of this work.

Funding

No external funding was received for this study.

Data Availability

The data that support the findings of this study are available on request from the corresponding author.

Conflict of Interest

The authors declare that there is no conflict of interest.

REFERENCES

[1] Ribeiro RP, Marziale MH, Martins JT, Galdino MJ, Ribeiro PH. Estresse ocupacional entre trabalhadores de saúde de um hospital universitário. Revista Gaúcha de Enfermagem. 2018 Jul 23;39:e65127. https://doi.org/10.1590/1983-1447.2018.65127

[2] Alrashidi NA, Mahdi GH, Elmagd MH, Alshmemri MS, Alghabbashi MT. Prevalence of work-related stress and its associated factors among healthcare professionals at Jazan region, Saudi Arabia. Journal of Pharmaceutical Negative Results. 2022 Oct 2;13:1174-83. https://doi.org/10.47750/pnr.2022.13.S01.144

[3] AlMuammar SA, Shahadah DM, Shahadah AO. Occupational stress in healthcare workers at a university hospital, Jeddah, Saudi Arabia. Journal of Family and Community Medicine. 2022 Sep 1;29(3):196-203. DOI: https://doi.org/10.4103/jfcm.jfcm_157_22

[4] Anand S, Mejid A. Prevalence and associated factors of work related stress among nurses working in Worabe Comprehensive and Specialized Hospital, south west Ethiopia. Prevalence. 2018 May;3(3):260-6.

[5] Mohamad O, AlKhoury N, Abdul-Baki MN, Alsalkini M, Shaaban R. Workplace violence toward resident doctors in public hospitals of Syria: prevalence, psychological impact, and prevention strategies: a cross-sectional study. Human resources for health. 2021 Dec;19:1-1. https://doi.org/10.1186/s12960-020-00548-x

[6] Gebeyehu S, Zeleke B. Workplace stress and associated factors among healthcare professionals working in public health care facilities in Bahir Dar City, Northwest Ethiopia, 2017. BMC research notes. 2019 Dec;12:1-5. https://doi.org/10.1186/s13104-019-4277-1

[7] Rafiq K, Batool SY, Fatima K, Mushtaq M, Sultana N, Saify ZS. Barriers and Attitudes toward Psychotherapy in Pakistan: A Cross-Sectional Study. Yemeni Journal for Medical Sciences. 2025 Sep 16;19(9).

[8] Habtu Y, Kumie A, Selamu M, Harada H, Girma E. Prevalence and determinants of occupational depression, anxiety, and stress among Ethiopian healthcare workers. Scientific Reports. 2024 Sep 18;14(1):21817. https://doi.org/10.1038/s41598-024-72930-x

[9] Almutairi AF, Hamdan NA, Altheyabi S, Alsaeed EA, Alammari FS, BaniMustafa AA. The prevalence and associated factors of occupational stress in healthcare providers in Saudi Arabia. International Journal of General Medicine. 2024 Dec 31:809-16. https://doi.org/10.2147/IJGM.S446410

[10] Abdo SA, El-Sallamy RM, El-Sherbiny AA, Kabbash IA. Burnout among physicians and nursing staff working in the emergency hospital of Tanta University, Egypt. East Mediterr Health J. 2016 Mar 15;21(12):906-15. https://doi.org/10.26719/2015.21.12.906

[11] Yousefy AR, Ghassemi GR. Job burnout in psychiatric and medical nurses in Isfahan, Islamic Republic of Iran. Eastern Mediterranean Health Journal. 2006 Sep 1;12(5):662. PMID: 17333807

[12] Elnakib S, Elaraby S, Othman F, BaSaleem H, Abdulghani AlShawafi NA, Saleh Al-Gawfi IA, Shafique F, Al-Kubati E, Rafique N, Tappis H. Providing care under extreme adversity: The impact of the Yemen conflict on the personal and professional lives of health workers. Soc Sci Med. 2021 Mar;272:113751. doi: 10.1016/j.socscimed.2021.113751. Epub 2021 Feb 6. PMID: 33588206; PMCID: PMC7938221.

[13] Ghaleb Alrubaiee G, Alsabri M, Abdulrahman Al-Qadasi F, Ali Hussein Al-Qalah T, Cole J, Abdullah Ghaleb Alburiahy Y. Psychosocial Effects of COVID-19 pandemic on Yemeni healthcare workers: A Web-based, Cross-sectional Survey. Libyan J Med. 2023 Dec;18(1):2174291. doi: 10.1080/19932820.2023.2174291. PMID: 36840952; PMCID: PMC9970220.

[14] Rija A, Islam Z, Bilal W, Qamar K, Gangat SA, Abbas S, Mirha HT, Mohanan P, Rahmat ZS, Shaeen SK, Djedid SNK, Essar MY, Kashyap R. The impact of violence on healthcare workers' mental health in conflict-based settings amidst COVID-19 pandemic, and potential interventions: A narrative review. Health Sci Rep. 2022 Nov 6;5(6):e920. doi: 10.1002/hsr2.920. PMID: 36381415; PMCID: PMC9638051.

[15] Cohen C, Pignata S, Bezak E, Tie M, Childs J. Workplace interventions to improve well-being and reduce burnout for nurses, physicians and allied healthcare professionals: a systematic review. BMJ Open. 2023 Jun 29;13(6):e071203. doi: 10.1136/bmjopen-2022-071203. PMID: 37385740; PMCID: PMC10314589.

[16] World Health Organization / Yemen Ministry of Health. National Mental Health Strategy in Yemen 2022–2026. (Policy document). 2022. emro.who.in available at: https://www.emro.who.int/images/stories/yemen/National_Mental_Health_Strateg__in_Yemen2022_2023_Eng.pdf?utm_source=chatgpt.com accessed on 24/9/2025.