Review Article

Burden of Burnout Syndrome among Emergency Physicians in the Kingdom of Saudi Arabia: A Systematic Review and Meta-Analysis

ABSTRACT

Burnout syndrome among healthcare professionals, particularly emergency physicians, is a significant global concern. In Saudi Arabia, high healthcare demands exacerbate this issue, leading to reduced care quality, lower patient satisfaction, and increased medical errors. This meta-analysis assessed the prevalence of burnout components, including high emotional exhaustion, high depersonalization, and low personal accomplishment, among emergency physicians in Saudi Arabia. A systematic search of databases identified six cross-sectional studies, with pooled estimates calculated using random-effects models. The findings revealed that 57.6% of emergency physicians experienced high emotional exhaustion, 42.8% reported high depersonalization, and 55.0% had low personal accomplishment, with overall burnout prevalence at 38.1%. The results highlight the urgent need for interventions focusing on workload management and supportive environments to improve physician well-being and healthcare quality.

Keywords: *Burnout syndrome, emergency physicians, emotional exhaustion, depersonalization, personal accomplishment.*

1. INTRODUCTION

Burnout syndrome is a multifaceted psychological phenomenon characterized by emotional exhaustion, depersonalization, and reduced personal accomplishment .[1] It is prevalent among healthcare professionals, including emergency physicians, and has garnered significant attention due to its adverse effects on individual well-being and healthcare delivery.[2]

Studies worldwide have reported high prevalence rates of burnout among healthcare professionals. For instance, a systematic review by Rotenstein et al. found that 67% of physicians experience burnout, with rates varying across specialties and regions.[3] Emergency physicians are at a heightened risk of burnout due to the demanding nature of their work, including high-stress environments, long working hours, and exposure to traumatic events.[4]

Several factors contribute to the development of burnout among healthcare professionals. Work-related stressors such as heavy workloads, time pressure, and inadequate resources can contribute to emotional exhaustion .[5] Depersonalization, characterized by negative attitudes and detachment from patients, may result from prolonged exposure to patient suffering and organizational challenges .[6] Reduced personal accomplishment, reflecting feelings of inefficacy and lack of achievement, can stem from perceived barriers to providing high-quality care and achieving professional goals.[7]

Burnout has profound consequences for healthcare professionals, affecting not only their well-being but also patient care and healthcare systems. Burnout is associated with increased rates

of depression, anxiety, substance abuse, and suicidal ideation among healthcare professionals.[8] It can lead to decreased job satisfaction, reduced productivity, and higher turnover rates, contributing to workforce shortages and healthcare system strain.[9]

The implications of burnout extend beyond individual healthcare professionals to impact healthcare systems as a whole. Burnout among healthcare providers is associated with decreased patient satisfaction, compromised quality of care, medical errors, and increased healthcare costs.[10]Burnout-related turnover and absenteeism further strain healthcare delivery and continuity of care.[11]

Addressing burnout requires multifaceted interventions at individual, organizational, and systemic levels. Individual-level interventions may include stress management programs, mindfulness-based interventions, and counselling services to support healthcare professionals' mental health.[2,4] Organizational strategies such as promoting work-life balance, improving work environments, providing resources for coping with stress, and fostering supportive leadership are crucial for mitigating burnout.[5,7] Systemic changes, including workload redistribution, policy reforms, and advocacy for healthcare provider well-being, are also essential to create sustainable solutions.[4,9]

Given the high prevalence of burnout among healthcare professionals and its significant impact on individuals and healthcare systems, there is a growing need for comprehensive research and evidence-based interventions. This meta-analysis seeks to contribute to the existing literature by synthesizing data on burnout among emergency physicians in the Kingdom of Saudi Arabia. By examining prevalence rates, identifying contributing factors, affecting emergency physician well-being in Saudi Arabia's healthcare context.

Study Aim

The aim of this meta-analysis is to determine the prevalence of burnout syndrome among emergency physicians in the Kingdom of Saudi Arabia.

2. MATERIAL AND METHODS

Study Design

This meta-analysis followed a systematic review methodology to synthesize existing literature on burnout among emergency physicians in the Kingdom of Saudi Arabia adhering to the PRISMA statement 2020.[12]

Study Duration

The study duration was 8 months encompassed the period from the inception of available literature up to the date of the final literature search. This allowed for the inclusion of recent studies and ensured the relevance and timeliness of the meta-analysis findings.

Search Strategy

A comprehensive search strategy was employed across multiple electronic databases including PubMed, Web of Science, Scopus, Medline, the Cochrane Library, and Google Scholar. The search strategy utilized a combination of keywords related to "burnout syndrome," "emergency physicians," and "Saudi Arabia," ensuring the capture of relevant studies.

Inclusion Criteria

Studies included in the meta-analysis met predefined inclusion criteria. These criteria encompassed studies conducted among emergency physicians in Saudi Arabia, reporting on burnout syndrome using standardized assessment tools such as the Maslach Burnout Inventory (MBI), and providing sufficient quantitative data for synthesis.

Exclusion Criteria

Any studies were conducted outside of Saudi Arabia, focused on non-emergency physician populations, or lacked necessary quantitative data for meta-analysis. Additionally, studies not available in full-text or published in languages other than English were excluded.

Study Screening

The screening process involved multiple stages to identify eligible studies. Initially, duplicates were removed, followed by title and abstract screening to assess relevance. Full-text articles were then assessed for eligibility based on the inclusion and exclusion criteria. The screening process was conducted independently by two reviewers, with discrepancies resolved through discussion or consultation with a third reviewer.

Data Extraction

Data extraction was carried out systematically from included studies using a predefined data extraction form. Relevant information extracted included study characteristics (e.g., author, year, study design), participant demographics (e.g., sample size, age), burnout assessment tools used, and outcome measures (prevalence rates of emotional exhaustion, depersonalization, low personal accomplishment, and overall burnout syndrome).

Quality Assessment

The quality of included studies was assessed using the Newcastle-Ottawa Scale (NOS) for cross-sectional studies. The NOS evaluates studies based on selection, comparability, and outcome assessment criteria, with higher scores indicating higher methodological quality.[13]

Quantitative Data Synthesis

Quantitative data synthesis was performed using R statistical software. Pooled prevalence estimates with 95% confidence intervals (CI) were calculated for each burnout component (emotional exhaustion, depersonalization, low personal accomplishment) and overall burnout syndrome using random-effects models. Heterogeneity across studies was assessed using I^2 statistics and visual inspection of forest plots, with sensitivity analyses conducted as needed to explore sources of heterogeneity.

3. RESULTS AND DISCUSSION

Results

Our comprehensive search yielded a total of 409 records across various databases, including PubMed, Web of Science, Scopus, Medline, the Cochrane Library, and Google Scholar. After removing 192 duplicates, 217 records remained for title and abstract screening. Of these, 168 records were excluded based on relevance and predefined inclusion criteria. Consequently, 49 full-text articles were sought for detailed evaluation, but 2 were not retrievable. The remaining 47 articles were assessed for eligibility, resulting in 41 exclusions due to various reasons such as not meeting the study design criteria or lack of relevant data. Finally, 6 studies were included in the quantitative synthesis. The selection process is depicted in the PRISMA flow diagram (Figure 1).

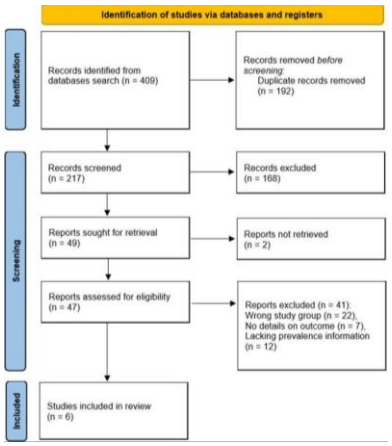

Figure 1: PRISMA flow diagram for study search and screening. All numerical data are displayed as (n)

Characteristics of the Included Studies

The six included studies were all cross-sectional in design, reflecting a consistent methodological approach to examining burnout syndrome among emergency physicians in Saudi Arabia. This design choice is pertinent for capturing the prevalence and associated factors of burnout in this population.

The studies were conducted in various settings across Saudi Arabia, indicating a broad geographic representation. Alhuwaydi et al. (2023) .[14] focused on hospitals in the Al-Jouf region, while Alqahtani et al. (2019) .[15] included hospitals in Abha and Khamis Mushait cities. Alsaawi et al. (2014) .[16] and Aldrees et al. (2013) .[17] both conducted their research in tertiary medical centers in Riyadh, suggesting a focus on high-volume, urban medical facilities. Alsaawi et al. (2019) .[18] expanded their scope to include participants from the Saudi Emergency Medicine Assembly (SEMA) 2015 conference, thus encompassing a national perspective. Alaslani et al. (2016) .[19] included three general hospitals located in Makkah, Riyadh, and Jeddah, thereby covering a mix of the central, western, and capital regions of Saudi Arabia.

The sample sizes of the studies varied, with the number of participating emergency physicians ranging from 25 to 265. Alhuwaydi et al. (2023) .[14] included 143 participants, whereas Alqahtani et al. (2019) .[15] had a smaller sample of 95. The study by Alsaawi et al. (2014) .[16] had 53 participants, and Alsaawi et al. (2019) .[18] had the largest sample size with 265 participants. Aldrees et al. (2013) .[17] had the smallest sample of 25, and Alaslani et al. (2016) .[19] included 160 participants. The variability in sample size underscores the different scopes and scales of the included studies.

The studies also reported on the gender distribution of participants, although not all provided complete data. Alsaawi et al. (2014) .[16] reported that 85.0% of their participants were male, and Alsaawi et al. (2019) .[18] reported 84.2% male participants. Alaslani et al. (2016) .[19] noted that 53.8% of their sample were male, indicating a more balanced gender distribution compared to the other studies.

All included studies utilized the Maslach Burnout Inventory (MBI) as the tool to assess burnout syndrome among emergency physicians. The MBI is a widely recognized and validated instrument for measuring burnout, ensuring consistency in the assessment across

studies. This uniformity allows for a more reliable comparison and synthesis of results across the different study populations.

The quality of the included studies was assessed using the Newcastle-Ottawa Scale (NOS). The scores ranged from 7 to 9, indicating generally high methodological quality. Alhuwaydi et al. (2023), Aldrees et al. (2013), and Alaslani et al. (2016) each received a score of 7, .[14,17,19] reflecting good quality but with minor limitations. Alsaawi et al. (2014) and Alsaawi et al. (2019) ,[16,18] both scored 8, while Alqahtani et al. (2019) ,[15] achieved the highest score of 9, indicating excellent quality with minimal risk of bias (table 1).

Table 1: Characters and NOS quality score of the included studies (n=6).

Study	Design	Study setting	Study duration	City	Participants number (Emergency physicians)	Males	Tool	NOS
Alhuwaydi et al., 2023 [14]	Cross-sectional	Al-Jouf Region Hospitals	2021-2022	Al-Jouf region	143		MBI	7
Alqahtani et al., 2019 [15]	Cross-sectional	Hospitals in Abha and Khamis Mushait cities	2019	Abha and Khamis Mushait cities	95		MBI	9
Alsaawi et al., 2014 [16]	Cross-sectional	Tertiary medical center	2014	Riyadh	53	85.0 %	MBI	8
Alsaawi et al., 2019 [17]	Cross-sectional	Saudi Emergency Medicine Assembly (SEMA) 2015 conference	2015	KSA	265	84.2 %	MBI	8
Aldrees et al., 2013 [18]	Cross-sectional	Tertiary medical center	2010	Riyadh	25		MBI	7
Alaslani et al., 2016 [19]	Cross-sectional	Three General hospitals	2016	Makkah, Riyadh, Jeddah	160	53.80%	MBI	7

Prevalence of Burnout Components

High Emotional Exhaustion

The meta-analysis included five studies to estimate the prevalence of high emotional exhaustion among emergency physicians in Saudi Arabia. The forest plot (Figure 2) shows a pooled prevalence of 57.60% (95% CI: 32.62%-79.22%) under the random effects model. Individual study prevalences varied, with Alqahtani et al. (2019) reporting the highest at

81.05% (95% CI: 71.72%-88.37%) and Alsaawi et al. (2019) the lowest at 35.85% (95% CI: 30.07%-41.94%).

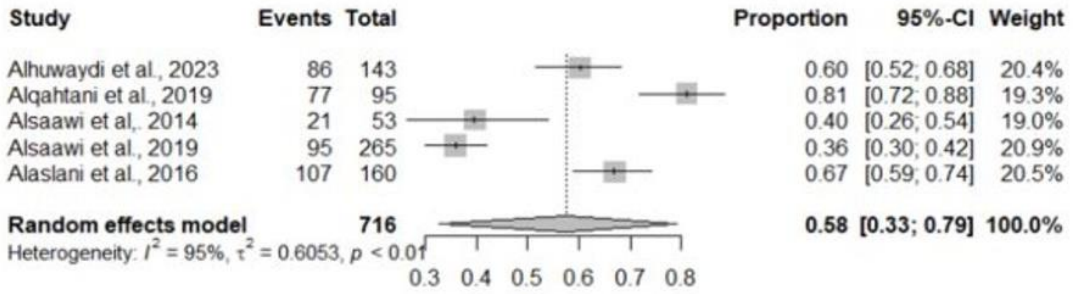

Figure 2: Forest plot of the prevalence of high emotional exhaustion among emergency physicians in Saudi Arabia**. CI** represent confidence interval **I2 , t2** represent heterogeneity all numerical data represented by (n) ,% present percentage

The high heterogeneity among studies was quantified with I^2 = 94.6% (95% CI: 90.2%-97.1%) and a highly significant Q statistic (Q = 74.62, p < 0.0001), indicating substantial variability in emotional exhaustion prevalence across studies.

The funnel plot for assessing publication bias in the prevalence of high emotional exhaustion (Figure 3) suggests asymmetry, indicating potential publication bias. This visual inspection highlights that smaller studies with lower prevalence estimates might be underrepresented in

the analysis.

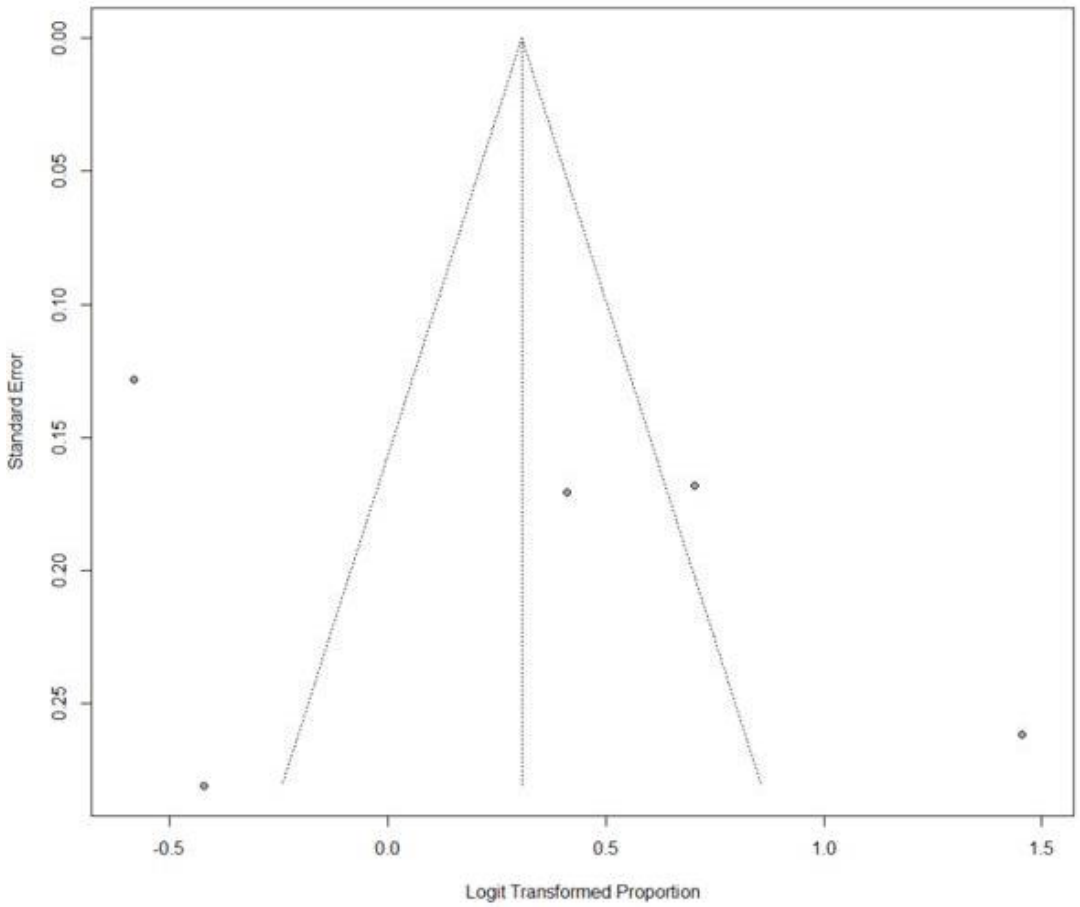

Figure 3: Funnel plot for publication bias assessment for the prevalence of high emotional exhaustion among emergency physicians in Saudi Arabia**.**

High Depersonalization

Four studies contributed to the analysis of high depersonalization among emergency physicians. The forest plot (Figure 4) shows a pooled prevalence of 42.83% (95% CI: 21.98%-66.58%) under the random effects model. The study by Alaslani et al. (2016) reported the highest prevalence at 56.25% (95% CI: 48.20%-64.07%), while Alqahtani et al. (2019) reported the lowest at 24.21% (95% CI: 16.01%-34.08%). Heterogeneity was also high with $I^2 = 88.6\%$ (95% CI: 73.4%-95.1%) and a significant Q statistic ($Q = 26.32$, $p < 0.0001$).

The funnel plot for high depersonalization prevalence (Figure 5) exhibits asymmetry, indicating potential publication bias. This suggests that smaller studies reporting lower depersonalization rates might be missing from the analysis.

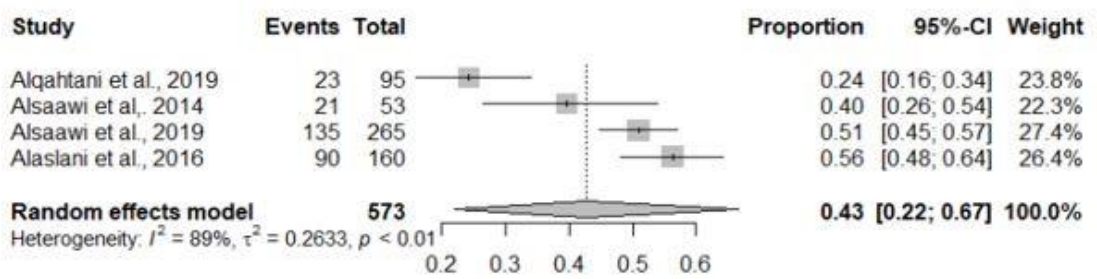

Figure 4: Forest plot of the prevalence of high depersonalization among emergency physicians in Saudi Arabia. CI represent confidence interval I2 , t2 represent heterogeneity all numerical data represented by (n) % present percentage

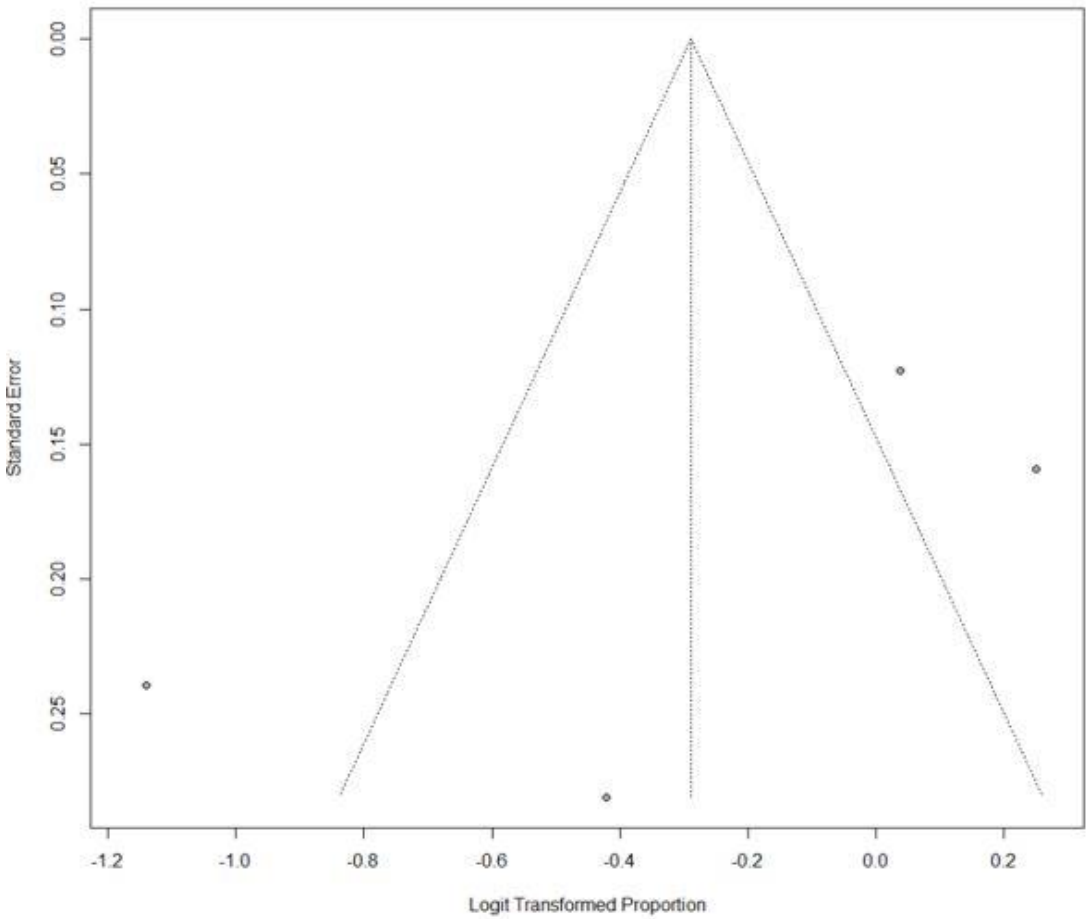

Figure 5: Funnel plot for publication bias assessment for the prevalence of high depersonalization among emergency physicians in Saudi Arabia**.**

Prevalence of Low Personal Accomplishments

The analysis of low personal accomplishments included four studies, with a pooled prevalence of 55.04% (95% CI: 5.78%-96.06%) under the random effects model (Figure 6). Alaslani et al. (2016) reported an exceptionally high prevalence of 95.62% (95% CI: 91.19%-98.22%),

whereas the lowest prevalence was observed by Alqahtani et al. (2019) at 27.37% (95% CI: 18.72%-37.48%). The heterogeneity was extremely high with I^2 = 96.6% (95% CI: 93.8%-98.1%) and a significant Q statistic (Q = 88.15, p < 0.0001), indicating substantial variability across studies.

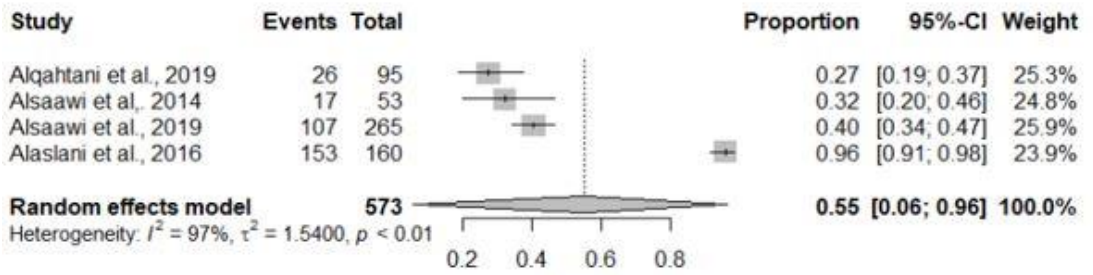

Figure 6: Forest plot of the prevalence of low personal accomplishments among emergency physicians in Saudi Arabia. **CI** represent confidence interval **I2, t2** represent heterogeneity all numerical data represented by (**n**) **%** present percentage

The funnel plot for low personal accomplishments prevalence (Figure 7) suggests potential publication bias due to asymmetry, indicating that smaller studies with lower prevalence rates may not have been published.

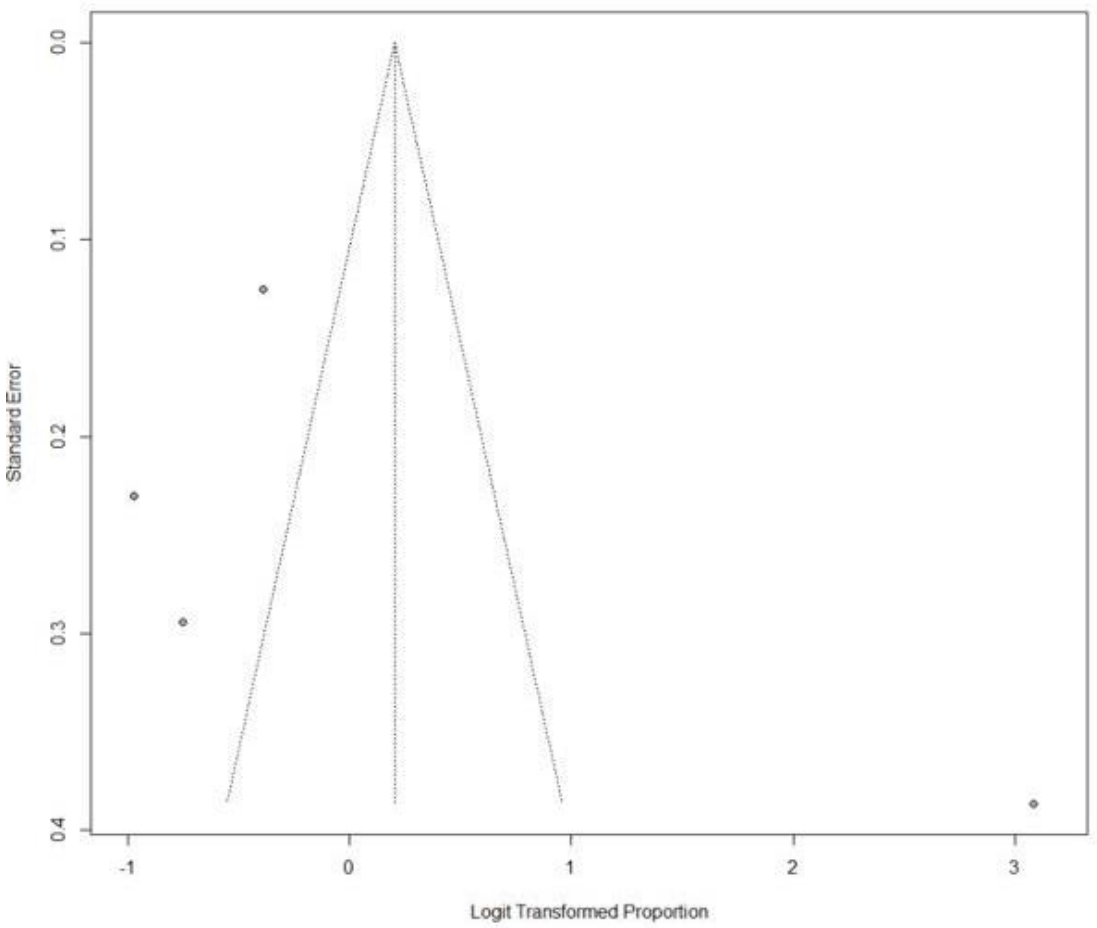

Figure 7: Funnel plot for publication bias assessment for the prevalence of low personal accomplishments among emergency physicians in Saudi Arabia.

Prevalence of Burnout Syndrome

Three studies were included in the analysis of overall burnout syndrome prevalence among emergency physicians. The forest plot (Figure 8) indicates a pooled prevalence of 38.08% (95% CI: 6.92%-83.56%) under the random effects model. Aldrees et al. (2013) reported the highest prevalence at 52.00% (95% CI: 31.31%-72.20%), while Alqahtani et al. (2019) reported the lowest at 18.95% (95% CI: 11.63%-28.28%). Heterogeneity was again high with I^2 = 91.1% (95% CI: 76.9%-96.6%) and a significant Q statistic (Q = 22.48, p < 0.0001).

The funnel plot for burnout syndrome prevalence (Figure 9) exhibits asymmetry, indicating potential publication bias. This suggests that smaller studies with lower burnout rates might be underrepresented, potentially skewing the overall prevalence estimate.

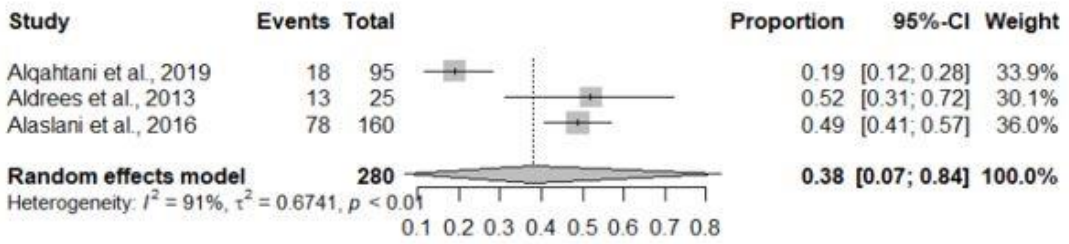

Figure 8: Forest plot of the prevalence of burnout syndrome among emergency physicians in Saudi Arabia. **CI** represent confidence interval **I2, t2** represent heterogeneity all numerical data represented by (n) **%** present percentage

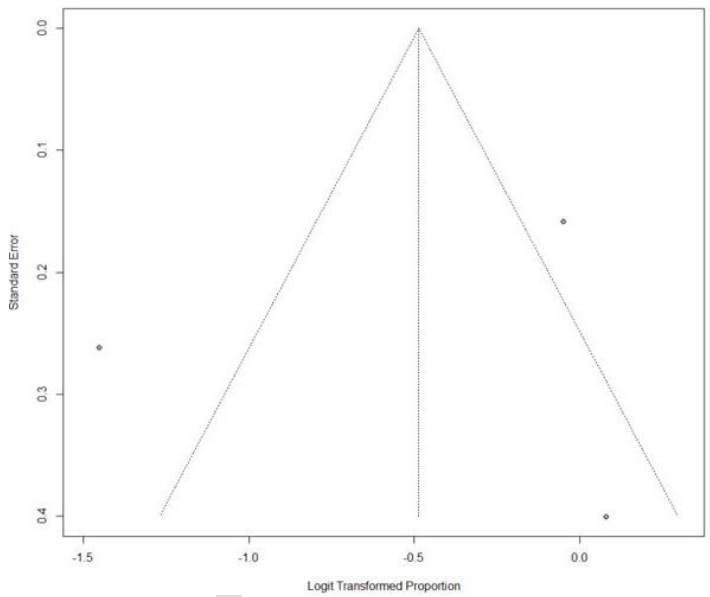

FIGURE 9: FUNNEL PLOT FOR PUBLICATION BIAS ASSESSMENT FOR THE PREVALENCE OF BURNOUT SYNDROME AMONG EMERGENCY PHYSICIANS IN SAUDI ARABIA.

Discussion

Burnout among healthcare professionals, including emergency physicians, is a significant concern globally .[2,4,5] In the Kingdom of Saudi Arabia (KSA), where healthcare demands are high and emergency departments are often under pressure, understanding the prevalence and factors contributing to burnout is crucial .[20–22]

Our meta-analysis synthesized data from six studies on burnout among emergency physicians in Saudi Arabia. Our results revealed high prevalence rates of burnout components among emergency physicians in KSA. The pooled prevalence of high emotional exhaustion was found to be 57.60%. (95% CI: 32.62%-79.22%), high depersonalization was 42.83% (95% CI: 21.98%-66.58%), low personal accomplishment was 55.04% (95% CI: 5.78%-96.06%), and overall burnout syndrome was 38.08% (95% CI: 6.92%-83.56%).

The high prevalence of emotional exhaustion among emergency physicians in Saudi Arabia, as indicated by our meta-analysis, underscores the intense nature of their work and the emotional toll it takes .[23] This finding is consistent with international studies reporting elevated emotional exhaustion levels among healthcare providers.[6,8,10] Factors such as

heavy workloads, long working hours, and limited resources contribute to this phenomenon .[2,4] Strategies such as implementing workload management protocols and promoting work-life balance are imperative to mitigate emotional exhaustion and improve physician well-being.

Depersonalization, characterized by negative attitudes and cynicism towards patients, was also prevalent among Saudi emergency physicians. This finding is concerning as it can lead to decreased patient satisfaction and compromised quality of care .[11] Interventions focusing on enhancing empathy, communication skills, and fostering positive patient-provider relationships are crucial to address depersonalization.[24]

The high prevalence of low personal accomplishment among emergency physicians is alarming, indicating feelings of inefficacy and reduced professional fulfillment. Studies have linked low personal accomplishment with increased burnout and decreased job satisfaction.[19] Enhancing professional development opportunities, providing recognition for achievements, and fostering a supportive work environment are essential strategies to boost personal accomplishment and combat burnout.[25]

Our meta-analysis also revealed an overall burnout prevalence of 38.08% among emergency physicians in Saudi Arabia. This finding aligns with global trends showing high burnout rates among healthcare professionals. .[26] Burnout not only affects individual well-being but also has implications for patient care, healthcare costs, and organizational productivity. .[27] Implementing organizational interventions such as promoting a culture of well-being, providing mental health resources, and addressing systemic issues contributing to burnout are imperative to mitigate its impact.

Comparing our findings with international literature, the prevalence of burnout components among Saudi emergency physicians appears to be in line with or slightly higher than global averages .[18] This suggests that burnout is a pervasive issue affecting healthcare professionals worldwide, regardless of cultural or regional differences. However, contextual factors such as cultural expectations, workload distribution, and healthcare system infrastructure may influence burnout rates.[28]

In summary our meta-analysis aimed to determine the prevalence of burnout syndrome among emergency physicians in Saudi Arabia, employing a systematic review methodology in accordance with the PRISMA guidelines. The study encompassed a comprehensive search across multiple databases and included only those studies that used standardized assessment tools like the Maslach Burnout Inventory.

The analysis revealed a pooled prevalence of high emotional exhaustion at 57.60%, high depersonalization at 42.83%, low personal accomplishments at 55.04%, and an overall burnout prevalence of 38.08%. The findings underscore the urgent need for targeted interventions to enhance physician well-being and improve healthcare delivery in Saudi Arabia.

Limitations of our meta-analysis include the inherent biases of the included studies, variations in measurement tools, and potential publication bias. Additionally, the heterogeneity observed across studies highlights the need for caution in interpreting pooled estimates. Future research should focus on longitudinal studies, standardized assessment tools, and interventions tailored to the unique needs of Saudi emergency physicians.

4. CONCLUSION

This meta-analysis shows a high prevalence of burnout among emergency physicians in Saudi Arabia, with 57.6% experiencing emotional exhaustion, 42.8% depersonalization, and 55.0% low personal accomplishment. Overall burnout was reported in 38.1% of participants, with significant variability and potential publication bias across studies. These findings emphasize the urgent need for interventions, such as workload management and supportive work environments, to address burnout and improve both physician well-being and patient care. Future research should explore effective strategies for mitigating burnout.

ETHICAL APPROVAL (WHERE EVER APPLICABLE)

No ethical approval was requested as the this article is a systematic review and meta-analysis

Disclaimer (Artificial intelligence)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

REFERENCES

1. Elshaer NSM, Moustafa MSA, Aiad MW, Ramadan M. Job stress and burnout syndrome among critical care healthcare workers. Alexandria J Med [Internet]. 2018

Sep 1;54(3):273-277. Available from: https://www.ajol.info/index.php/bafm/article/view/178940

2. Embriaco N, Papazian L, Kentish-Barnes N, Pochard F, Azoulay E. Burnout syndrome among critical care healthcare workers. Curr Opin Crit Care [Internet]. 2007 Oct 1;13(5):482-488. Available from: https://www.academia.edu/39692356/Burnout_syndrome_among_critical_care_healthcare_workers

3. Rotenstein LS, Torre M, Ramos MA, Rosales R, Guille C, Sen S, et al. Prevalence of burnout among physicians: a systematic review. JAMA [Internet]. 2018 Sep 18;320(11):1131-1150. Available from: https://jamanetwork.com/journals/jama/articlepdf/2702871/jama_Rotenstein_2018_oi_180096.pdf

4. Boutou AK, Pitsiou G, Sourla E, Kioumis I. Burnout syndrome among emergency medicine physicians: an update on its prevalence and risk factors. Eur Rev Med Pharmacol Sci [Internet]. 2019 Oct 1;23(20):9058-9065. Available from: https://pubmed.ncbi.nlm.nih.gov/31696496/

5. Arora M, Asha S, Chinnappa J, Diwan AD. Review article: burnout in emergency medicine physicians. Emerg Med Australas [Internet]. 2013 Oct 9;25(6):491-495. Available from: http://dx.doi.org/10.1111/1742-6723.12135

6. Potter C. To what extent do nurses and physicians working within the Emergency Department experience burnout: a review of the literature. Australas Emerg Nurs J. 2006;9(2):57-64. doi:10.1016/j.aenj.2006.03.006

7. Feeks C, Chao J, Sinert R. Prevalence and risk factors for burnout in pediatric emergency medicine fellows. Pediatr Emerg Care. 2020;36(4):236-239. doi:10.1097/PEC.000000000000209

8. Bridgeman PJ, Bridgeman MB, Barone J. Burnout syndrome among healthcare professionals. Am J Health Syst Pharm. 2018;75(3):147-152. doi:10.2146/ajhp170460

9. Losa Iglesias ME, Becerro de Bengoa Vallejo R, Salvadores Fuentes P. Reflections on the burnout syndrome and its impact on healthcare providers. Ann Afr Med. 2010;9(4):197-198. doi:10.4103/1596-3519.7095

10. Patel RS, Bachu R, Adikey A, Malik M, Shah M. Factors Related to Physician Burnout and Its Consequences: A Review. Behav Sci (Basel). 2018 Oct 25;8(11):98. doi: 10.3390/bs8110098.

11. West CP, Dyrbye LN, Shanafelt TD. Physician burnout: contributors, consequences, and solutions. J Intern Med. 2018;283(6):516-529. doi:10.1111/joim.12752

12. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ. 2021 Mar 29;372:n71. doi: 10.1136/bmj.n71. PMID: 33782057; PMCID: PMC8005924.

13. Stang A. Critical evaluation of the Newcastle-Ottawa scale for the assessment of the quality of nonrandomized studies in meta-analyses. Eur J Epidemiol. 2010;25(9):603-605. doi:10.1007/s10654-010-9491-z

14. Alhuwaydi A, Alayshan M, Alghutayghit A, Alsadilah M. Burnout syndrome in emergency department healthcare providers in Aljouf region. Int J Med Dev Ctries. 2023;7(1):10.24911/ijmdc.51-167570792.

15. Alqahtani AM, Awadalla NJ, Alsaleem SA, Alsamghan AS, Alsaleem MA. Burnout Syndrome among Emergency Physicians and Nurses in Abha and Khamis Mushait Cities, Aseer Region, Southwestern Saudi Arabia. ScientificWorldJournal. 2019 Feb 18;2019:4515972. doi: 10.1155/2019/4515972

16. Alsaawi A, Alrajhi K, Albaiz S, Alsultan M, Alsalamah M , Qureshi S, et al. Risk of burnout among emergency physicians at a tertiary care center in Saudi Arabia. J Hosp Admin. 2014;3:20. doi:10.5430/jha.v3n4p20.

17. Aldrees TM, Aleissa S, Zamakhshary M, Badri M, Sadat-Ali M. Physician well-being: prevalence of burnout and associated risk factors in a tertiary hospital, Riyadh, Saudi Arabia. Ann Saudi Med. 2013 Sep-Oct;33(5):451-6. doi: 10.5144/0256-4947.2013.451.

18. Alsaawi A, Alrajhi K, AlRasheed N, Alsabhan A, Altamimi D, Alsalamah M. Burnout among emergency physicians in Saudi Arabia: a cross-sectional study. J Health Inform Dev Ctries. 2019;19(1).

19. Alaslani M, Mufti M, Alasmari M, Alsaidlani H, Alsaif A, salman A, et al. Are emergency medicine physicians at higher risk for burnout? An experience from Saudi Arabia. Int J Adv Res. 2016; 4:1675-1681. doi:10.21474/ijar01/1978.

20. Dawoud SO, Ahmad AM, Alsharqi OZ, Al-Raddadi RM. Utilization of the Emergency Department and Predicting Factors Associated With Its Use at the Saudi Ministry of Health General Hospitals. Glob J Health Sci. 2015 May 17;8(1):90-106. doi: 10.5539/gjhs.v8n1p90.

21. Alnasser S, Alharbi M, AAlibrahim A, Aal Ibrahim A, Kentab O, Alassaf W, et al. Analysis of Emergency Department Use by Non-Urgent Patients and Their Visit Characteristics at an Academic Center. Int J Gen Med. 2023 Jan 20;16:221-232. doi: 10.2147/IJGM.S391126. Erratum in: Int J Gen Med. 2023 Jan 26;16:357-358. doi: 10.2147/IJGM.S405920.

22. Al Mutairi M, Jawadi A, Al Harthy N, Al Enezi F, Aljerian N, Alqahtani A, et al. Emergency medical service system in the Kingdom of Saudi Arabia. J Med Sci Clin Res. 2016;4(10):13084-13092. doi:10.18535/jmscr/v4i10.31.

23. Shanafelt TD, Boone S, Tan L, Dyrbye LN, Sotile W, Satele D, et al. Burnout and satisfaction with work-life balance among US physicians relative to the general US population. Arch Intern Med. 2012 Oct 8;172(18):1377-85. doi: 10.1001/archinternmed.2012.3199

24. Shanafelt TD, Gorringe G, Menaker R, Storz KA, Reeves D, Buskirk SJ, et al. Impact of organizational leadership on physician burnout and satisfaction. Mayo Clin Proc. 2015 Apr;90(4):432-40. doi: 10.1016/j.mayocp.2015.01.012.

25. Halbesleben JR, Rathert C. Linking physician burnout and patient outcomes: exploring the dyadic relationship between physicians and patients. Health Care Manage Rev. 2008;33:29-39. doi:10.1097/01.HMR.0000304493.87898.72.

26. Dyrbye LN, Shanafelt TD, Sinsky CA, Pamela F, Alexander J, West C, et al. Burnout among health care professionals: a call to explore and address this underrecognized threat to safe, high-quality care. NAM Perspect. 2017;7:10.31478/201707b.

27. Panagioti M, Panagopoulou E, Bower P, Lewith G, Kontopantelis E, Chew-Graham C, et al. Controlled Interventions to Reduce Burnout in Physicians: A Systematic Review and Meta-analysis. JAMA Intern Med. 2017 Feb 1;177(2):195-205. doi: 10.1001/jamainternmed.2016.7674. Erratum in: JAMA Intern Med. 2024 Oct 1;184(10):1270. doi: 10.1001/jamainternmed.2024.4586.

28. Shanafelt TD, Noseworthy JH. Executive leadership and physician well-being: nine organizational strategies to promote engagement and reduce burnout. Mayo Clin Proc. 2017; 92:129-146. doi: 10.1016/j.mayocp.2016.10.004.