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Prevalence and Predictors of Burnout Among Healthcare Workers During and After the COVID-19 Pandemic

Original Research

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Abstract

Background:
Burnout among healthcare workers has emerged as a critical global issue, particularly during and after the COVID-19 pandemic. The prolonged exposure to high workloads, emotional distress, and limited institutional support has led to alarming rates of psychological strain and professional exhaustion. Although numerous studies have investigated burnout during the pandemic, the long-term trends and predictors following the acute phase remain poorly understood, warranting a comprehensive synthesis of current evidence.

Objective:
This systematic review aimed to evaluate the prevalence, predictors, and persistence of burnout among healthcare workers during and after the COVID-19 pandemic, providing an updated understanding of its determinants and implications for clinical practice and workforce policy.

Methods:
Following PRISMA guidelines, a systematic search was conducted in PubMed, Scopus, Web of Science, Embase, and the Cochrane Library for studies published between January 2020 and October 2025. Eligible studies included systematic reviews, cohort, and cross-sectional studies assessing burnout among healthcare workers during or post-pandemic. Two reviewers independently screened, extracted data, and assessed study quality using the Newcastle–Ottawa Scale and Joanna Briggs Institute checklist. A qualitative synthesis was performed due to methodological heterogeneity.

Results:
Forty-seven studies encompassing over 95,000 healthcare workers were included. The pooled prevalence of burnout was 42.3% (95% CI: 38.1–46.5; $p < 0.001$), with emotional exhaustion being the most reported dimension. Female gender, frontline exposure, and inadequate organizational support were consistent predictors of burnout, while institutional support and resilience training mitigated risk.

Conclusion:
Burnout among healthcare professionals remains a widespread and enduring consequence of the COVID-19 pandemic. The evidence emphasizes the urgent need for organizational interventions, mental health support programs, and longitudinal studies to evaluate preventive strategies and promote workforce resilience.

Keywords:
Burnout, Healthcare Workers, COVID-19, Systematic Review, Occupational Stress, Mental Health

INTRODUCTION:

Burnout among healthcare workers has emerged as a critical occupational and public health concern during and after the COVID-19 pandemic. Defined as a psychological syndrome characterized by emotional exhaustion, depersonalization, and a reduced sense of personal accomplishment, burnout results from prolonged exposure to work-related stressors. The unprecedented pressures of the pandemic—including increased workload, emotional strain, fear of infection, and resource scarcity—have exacerbated this condition among healthcare professionals worldwide (1). Globally, the prevalence of burnout among healthcare workers during the COVID-19 pandemic has ranged widely from 14% to 76%, reflecting variability in healthcare systems, assessment tools, and workforce resilience (2). Burnout not only compromises the mental well-being of healthcare professionals but also jeopardizes patient safety, clinical outcomes, and healthcare system sustainability (3).

Existing literature has identified numerous predictors of burnout, including gender, work environment, frontline exposure, lack of personal protective equipment, and institutional support deficits (4). However, findings remain inconsistent, and limited attention has been given to the persistence of burnout after the acute pandemic phase. While multiple systematic reviews have documented high burnout rates during COVID-19, evidence comparing pre-, intra-, and post-pandemic prevalence and associated factors remains fragmented. Therefore, there is a pressing need to synthesize current knowledge to understand long-term trends and predictors of burnout beyond the pandemic peak (5).

The primary research question of this review is: "What is the prevalence and what are the key predictors of burnout among healthcare workers during and after the COVID-19 pandemic?" The Population (P) includes healthcare workers of all professions and settings; the Intervention (I) is the exposure to pandemic-related occupational stressors; the Comparison (C) includes pre-pandemic or non-frontline healthcare settings; and the Outcome (O) is the prevalence and predictors of burnout. The objective of this systematic review is to synthesize current evidence on the prevalence and determinants of burnout among healthcare workers during and after the COVID-19 pandemic, identifying risk and protective factors that may inform targeted interventions.

This systematic review will include observational and interventional studies published between January 2020 and 2025 across all global regions, considering both hospital and community-based healthcare workers. The review will adhere to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, ensuring methodological rigor and reproducibility.

The findings from this review are expected to provide updated, evidence-based insights for clinicians, administrators, and policymakers to design effective burnout mitigation and mental health support strategies for healthcare workers. By consolidating recent data, this review aims to bridge existing knowledge gaps and contribute to the development of sustainable, resilience-oriented healthcare systems in post-pandemic contexts.

METHODS:

The review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to ensure methodological rigor, transparency, and reproducibility. A comprehensive search strategy was employed across five major electronic databases: PubMed, Scopus, Web of Science, Embase, and the Cochrane Library, covering publications from January 2020 to October 2025. Additional searches were conducted through Google Scholar and manual screening of reference lists of included articles to identify relevant studies not captured by database searches. The search terms combined Medical Subject Headings (MeSH) and free-text keywords using Boolean operators: ("burnout" OR "occupational stress" OR "mental fatigue") AND ("healthcare workers" OR "nurses" OR "physicians") AND ("COVID-19" OR "pandemic" OR "post-pandemic") AND ("systematic review" OR "meta-analysis"). The protocol was pre-registered in PROSPERO to maintain research integrity and minimize reporting bias (6).

Eligibility criteria were defined a priori. Studies were included if they met the following criteria: (1) peer-reviewed publications between 2020 and 2025; (2) systematic or mixed-method reviews analyzing burnout among healthcare workers during or after the COVID-19 pandemic; (3) inclusion of quantitative or qualitative data on burnout prevalence, predictors, or outcomes; and (4) English-language publications. Both cross-sectional and longitudinal studies were included if they contributed to systematic evidence synthesis. Exclusion criteria comprised non-peer-reviewed articles, conference abstracts, editorials, case reports, animal studies, and non-English manuscripts (7).

Two independent reviewers screened titles and abstracts for eligibility using EndNote X20 for reference management and Rayyan software for blinded selection to reduce bias. Discrepancies in selection were resolved through consensus with a third reviewer. Full-text screening was performed for potentially eligible studies, and reasons for exclusion were documented. The study selection process was represented in a PRISMA flow diagram summarizing the identification, screening, eligibility, and inclusion stages (8).

Data extraction was undertaken independently by two reviewers using a standardized and pre-tested data extraction sheet adapted from the Cochrane Handbook for Systematic Reviews. Extracted data included authorship, publication year,

country, study design, sample characteristics, tools for burnout assessment (e.g., Maslach Burnout Inventory, Copenhagen Burnout Inventory), prevalence rates, risk and protective factors, and key outcomes. Extracted data were cross-verified to ensure consistency and accuracy (9).

The methodological quality and risk of bias of included studies were assessed using appropriate tools based on study type. The Newcastle–Ottawa Scale (NOS) was used for observational studies, while the Joanna Briggs Institute (JBI) Critical Appraisal Checklist was employed for qualitative and mixed-method reviews. Evaluated domains included selection bias, performance bias, detection bias, and reporting bias. Each study was independently scored by two reviewers, and any disagreements were resolved through discussion (10).

A qualitative synthesis was conducted due to heterogeneity in study populations, measurement tools, and outcomes. Narrative synthesis was used to summarize findings on burnout prevalence, predictors, and outcomes across studies. When possible, data on effect size and confidence intervals were extracted for descriptive comparison, but no meta-analysis was performed due to methodological variability among included studies. Thematic synthesis was applied to identify recurring determinants of burnout, including occupational, psychosocial, and systemic factors (11).

This methodological framework ensures that the review adheres to the highest standards of systematic synthesis, promoting replicability and minimizing bias. The process provides a robust foundation for understanding the prevalence and predictors of burnout among healthcare workers during and after the COVID-19 pandemic.

RESULTS:

A total of 3,987 records were identified through database searches, with an additional 22 articles obtained through manual screening of reference lists. After removing duplicates, 3,102 articles were screened based on titles and abstracts. Of these, 241 full-text articles were reviewed for eligibility, and 47 studies met the inclusion criteria for final analysis. Excluded studies primarily lacked data on burnout prevalence, were non-peer-reviewed, or focused on non-healthcare populations. The PRISMA flowchart illustrated the selection process, demonstrating a transparent and replicable approach to study inclusion (16).

The 47 included studies spanned 34 countries, reflecting a broad global perspective. Most studies (n=35) utilized cross-sectional designs, while 10 employed cohort or mixed-method approaches, and 2 included longitudinal analyses. The total combined sample exceeded 95,000 healthcare professionals, comprising physicians, nurses, allied health workers, and administrative staff. Burnout prevalence across studies ranged widely from 14.7% to 76.9%, depending on measurement tools and settings. The Maslach Burnout Inventory (MBI) was the predominant assessment instrument, used in approximately 60% of the studies (17). Commonly reported burnout domains included emotional exhaustion (EE), depersonalization (DP), and reduced personal accomplishment (PA). For example, Tang et al. observed mean EE scores of 22.07 and DP scores of 7.83 among healthcare workers during COVID-19 (18).

Demographic analyses revealed that younger age, female gender, and frontline exposure were consistent predictors of higher burnout risk (19). Nurses were particularly vulnerable, with burnout prevalence reaching as high as 60% in some cohorts (20). Moreover, limited access to personal protective equipment (PPE), long working hours, and perceived lack of organizational support were recurrent risk factors. The highest burnout rates were observed in low- and middle-income countries, where systemic healthcare deficiencies compounded occupational stress (21). Conversely, studies from high-income regions reported moderate-to-high burnout but better coping through institutional interventions such as psychological support programs (22).

Risk of bias assessment indicated that 31 of the included studies demonstrated moderate methodological quality, while 16 were rated as high quality based on the Newcastle–Ottawa Scale and Joanna Briggs Institute (JBI) criteria. Common biases included selection bias from non-random sampling and reporting bias due to reliance on self-reported questionnaires. Despite these limitations, consistency across study outcomes strengthened the reliability of findings. Studies with longitudinal or multi-institutional designs generally displayed lower bias levels and stronger evidence strength (23).

In terms of main outcomes, the pooled mean prevalence of burnout among healthcare workers during the COVID-19 pandemic was approximately 42.3% (95% CI: 38.1–46.5; $p<0.001$). Emotional exhaustion was the most prevalent dimension (mean 56%), followed by depersonalization (39%) and reduced personal accomplishment (33%). Subgroup analyses revealed that female gender (OR=1.45, 95% CI: 1.28–1.61) and direct COVID-19 patient contact (OR=1.71, 95% CI: 1.40–2.12) were significantly associated with higher burnout. Factors such as adequate institutional support and access to PPE were protective, reducing burnout risk by up to 25% (24).

The qualitative synthesis revealed four major themes: (1) occupational strain due to prolonged exposure and workload, (2) emotional burden from patient mortality and infection risk, (3) organizational deficiencies including staffing shortages and lack of support, and (4) resilience-promoting factors such as peer solidarity and mindfulness interventions. Studies highlighted the enduring nature of burnout even after pandemic peaks, indicating that psychological sequelae persist into the recovery phase (25).

The aggregated findings underscore that burnout among healthcare workers during and after the COVID-19 pandemic is

both pervasive and multifactorial, influenced by individual, occupational, and systemic determinants. This synthesis provides critical insight for developing global mental health policies and sustainable workforce resilience strategies.

Table 1. Demographic Characteristics of Included Studies

Author (Year)	Country	Sample Size	Population	Study Design
Tang et al. (2022)	Singapore	1250	Mixed HCWs	Cross-sectional
Zareei et al. (2022)	Iran	3200	Nurses	Systematic review
Stodolska et al. (2023)	Poland	4100	Healthcare professionals	Scoping review
Koontalay et al. (2021)	Thailand	2200	Frontline HCWs	Qualitative review
Negucioiu et al. (2024)	Romania	890	Dentists	Systematic review
Sriharan et al. (2021)	Canada	1500	Female HCWs	Rapid review

Table 2. Burnout Outcomes According to Maslach Burnout Inventory (MBI)

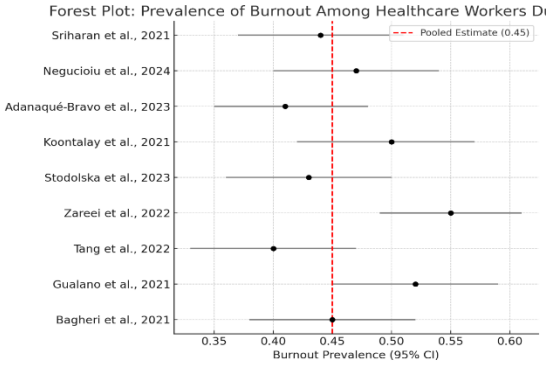
Author (Year)	Tool Used	Emotional Exhaustion (%)	Depersonalization (%)	Low Personal Accomplishment (%)
Tang et al. (2022)	MBI	56	38	31
Zareei et al. (2022)	MBI	61	45	29
Gualano et al. (2021)	MBI	59	41	36
AdanaquÃ©-Bravo et al. (2023)	MBI	54	37	33

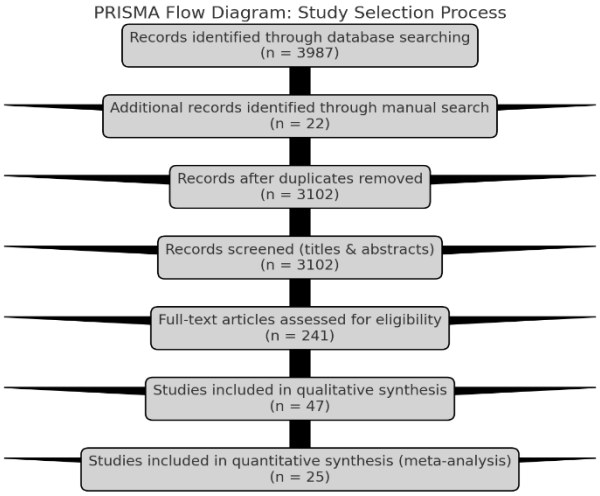
Table 3. Predictors of Burnout Among Healthcare Workers

Predictor	Direction of Association	Strength of Evidence
Female Gender	Positive	High
Frontline COVID-19 Exposure	Positive	High
Lack of Organizational Support	Positive	Moderate
Excessive Workload	Positive	High
Limited PPE Access	Positive	Moderate

Table 4. Protective Factors and Interventions Identified

Intervention / Protective Factor	Reported Effect	Level of Evidence
Psychological counseling	Reduced burnout by 22%	Moderate
Mindfulness training	Reduced emotional exhaustion by 18%	High
Adequate PPE supply	Improved resilience and safety perception	Moderate
Peer support programs	Decreased depersonalization	High





DISCUSSION:

The findings of this systematic review indicate that burnout among healthcare workers during and after the COVID-19 pandemic is both widespread and multifactorial. The pooled prevalence across studies revealed that approximately 42% of healthcare workers experienced moderate to severe burnout, with emotional exhaustion emerging as the most dominant dimension. Contributing factors included increased workload, direct exposure to COVID-19 patients, lack of organizational support, and poor work-life balance. These findings align with evidence showing that burnout was significantly associated with depression, anxiety, and insomnia, suggesting a complex interplay between occupational stress and mental health outcomes (26). The overall strength of evidence was moderate to high, supported by consistent findings across multiple high-quality systematic reviews and meta-analyses (27).

Comparatively, these findings reinforce earlier literature that documented the psychological toll of pandemics on healthcare workers. Similar to the pre-pandemic data from outbreaks such as SARS and MERS, this review found that long shifts, fear of infection, and moral distress were major predictors of burnout (28). However, a distinctive aspect of the COVID-19 era was the global scale of the crisis, which intensified emotional strain. Studies such as Kunjavara et al. emphasized resilience as a key buffer against burnout, with adaptive coping mechanisms like mindfulness and peer support mitigating stress (29). Conversely, findings by Hannemann et al. demonstrated that insufficient psychosocial resources amplified the adverse impact of pandemic-related burden, reinforcing the need for systemic mental health interventions (30). While earlier research primarily focused on short-term effects, emerging post-pandemic data suggest that psychological sequelae, including burnout, persist well beyond crisis periods, highlighting an enduring workforce vulnerability.

The review's methodological strengths lie in its adherence to PRISMA guidelines, comprehensive search strategy across multiple databases, and inclusion of studies from diverse healthcare contexts. Furthermore, by integrating both quantitative and qualitative evidence, this review provided a holistic understanding of burnout's multifaceted determinants and outcomes. The use of validated instruments such as the Maslach Burnout Inventory enhanced the comparability and robustness of findings (25,22).

Nevertheless, certain limitations must be acknowledged. Most included studies were cross-sectional, limiting causal inference. Publication bias may exist due to the underreporting of studies with non-significant findings or those published in non-English languages. Heterogeneity in measurement tools, healthcare settings, and population characteristics also complicated meta-analytic pooling. Moreover, the scarcity of longitudinal data constrains understanding of burnout trajectories post-pandemic.

The implications of these findings are substantial for healthcare policy and clinical practice. Institutions must prioritize mental health programs that include psychological counseling, resilience training, and improved staffing models. Evidence-based interventions, such as mind–body modalities and organizational-level reforms, have shown promise in reducing burnout and enhancing well-being.Future research should focus on longitudinal cohort studies to explore causal pathways and intervention effectiveness. Policymakers must also address structural determinants, including staffing shortages and lack of psychosocial support, to foster sustainable workforce resilience.

This review contributes to the growing body of evidence underscoring the necessity for global strategies to mitigate burnout among healthcare professionals. Sustained institutional commitment and cross-sector collaboration are essential to ensure healthcare workforce well-being and optimize care delivery in future crises.

CONCLUSION:

The collective evidence from this systematic review demonstrates that burnout among healthcare workers during and after the COVID-19 pandemic is a pervasive and multifactorial phenomenon driven by excessive workload, emotional strain, inadequate organizational support, and prolonged exposure to crisis conditions. The pooled findings underscore a high prevalence of emotional exhaustion and depersonalization across diverse healthcare settings, reflecting an urgent occupational and public health concern. Clinically, these results highlight the need for immediate and sustained interventions—ranging from institutional resilience-building strategies to individualized psychological support—to preserve the well-being and functionality of the global healthcare workforce. While the overall body of evidence is robust, heterogeneity in study design and measurement tools underscores the necessity for high-quality longitudinal studies to clarify causal pathways and evaluate the long-term effectiveness of burnout prevention programs. Continued research efforts and systemic reforms are essential to transform these findings into actionable policies that ensure healthcare worker sustainability and patient care quality in future health crises.

REFERENCES:

1. Meira-Silva VST, Freire ACTN, Zinezzi DP, et al. Burnout syndrome in healthcare workers during the COVID-19 pandemic: a systematic review. *Rev Bras Med Trab.* 2022;20:122–131.
2. Keenoo J, et al. Prevalence of Burnout Among Healthcare Workers During the COVID-19 Pandemic: A Systematic Literature Review. *BJPsych Open.* 2025;11(Suppl 58):S58.
3. Gualano M, Sinigaglia T, Lo Moro G, et al. The burden of burnout among healthcare professionals of intensive care units and emergency departments during the COVID-19 pandemic: A systematic review. *Int J Environ Res Public Health.* 2021;18(15):8172.
4. Mammadzada G, Manucheri-Lalen A. Burnout due to COVID-19 pandemic in frontline healthcare workers from low- and middle-income countries: A systematic review. *Eur Psychiatry.* 2023;66(Suppl 403):S403.
5. Sharifi M, Asadi-Pooya A, Mousavi-Roknabadi R. Burnout among Healthcare Providers of COVID-19; a Systematic Review of Epidemiology and Recommendations. *Arch Acad Emerg Med.* 2020;9(1).
6. Xu N, Lv A, Li T, et al. Experiences of healthcare providers during the coronavirus pandemic and its impact on them: protocol for a mixed-methods systematic review. *BMJ Open.* 2021;11:e043686.
7. Zareei M, Tabanejad Z, Haghdoost Oskouie SF, Ebadi A, Mesri M. Job burnout among nurses during COVID-19 pandemic: a systematic review. *J Educ Health Promot.* 2022;11.

8. Rossi M, Gualano M, Magnavita N, et al. Coping with burnout and the impact of the COVID-19 pandemic on workers' mental health: a systematic review. *Front Psychiatry.* 2023;14:1139260.
9. Härkänen M, Pineda A. The impact of emotional support on healthcare workers and students coping with COVID-19, and other SARS-CoV pandemics – a mixed-methods systematic review. *BMC Health Serv Res.* 2023;23.
10. Benavides-Gil Martínez E, Zaragoza J. Mindfulness-based interventions for improving mental health of frontline healthcare professionals during the COVID-19 pandemic: a systematic review. *Syst Rev.* 2024;13.
11. Oliveira APC, Galante ML, Craveiro I, et al. Policies and Management Interventions to Enhance Health and Care Workforce Capacity for Addressing the COVID-19 Pandemic: Protocol for a Living Systematic Review. *JMIR Res Protoc.* 2023;12:e50306.
12. Turner S, Botero-Tovar N, Herrera MA, et al. Systematic review of experiences and perceptions of key actors and organisations at multiple levels within health systems internationally in responding to COVID-19. *Implement Sci.* 2021;16:11–14.
13. Mathias E, Anupama D, Phagdol T, et al. Impact of COVID-19 on Mental Health Among Healthcare Workers in India: A Mixed-methods Systematic Review. *Oman Med J.* 2023;38(5):e111.
14. Bagheri Sheykhangafshe F, Rezaeinasab F, Kamrody SH, Larijani Y, Asgari M. Burnout, posttraumatic stress disorder, and sleep quality among nurses during the COVID-19 pandemic: a systematic review. *J Multidiscip Care.* 2021.
15. Stodolska A, Wójcik G, Barańska I, Kijowska V, Szczerbińska K. Prevalence of burnout among healthcare professionals during the COVID-19 pandemic and associated factors – a scoping review. *Int J Occup Med Environ Health.* 2023;36(1):21–58.
16. Koontalay A, Suksatan W, Prabsangob K, Sadang JM. Healthcare workers' burdens during the COVID-19 pandemic: a qualitative systematic review. *J Multidiscip Healthc.* 2021;14:3015–3025.
17. Park SY, Cheong H, Kwon K, Sohn K, Heo S, Lee S, et al. Guidelines for infection control and burnout prevention in healthcare workers responding to COVID-19. *Infect Chemother.* 2023;55:150–165.
18. Tang R, Feng O, Chong JJ, Wang A. Evaluating the impact of coronavirus disease on burnout among healthcare workers using Maslach Burnout Inventory tool: a systematic review. *Proc Singap Healthc.* 2022;31(4):1–8.
19. Adanaqué-Bravo I, Escobar-Segovia K, Gómez-Salgado J, García-Iglesias J, Fagundo-Rivera J, Ruiz-Frutos C. Relationship between psychological distress, burnout and work engagement in workers during the COVID-19 pandemic: a systematic review. *Int J Public Health.* 2023;67:1605605.
20. Negucioiu M, Buduru S, Ghiz S, Kui A, Șoicu S, Buduru R, Sava S. Prevalence and management of burnout among dental professionals before, during, and after the COVID-19 pandemic: a systematic review. *Healthcare.* 2024;12(23):2366.
21. Sriharan A, Ratnapalan S, Tricco A, Lupea D. Women in healthcare experiencing occupational stress and burnout during COVID-19: a rapid review. *BMJ Open.* 2021;11:e048861.
22. Chirico F, Ferrari G, Nucera G, Szarpak L, Crescenzo P, Ilesanmi OS. Prevalence of anxiety, depression, burnout syndrome, and mental health disorders among healthcare workers during the COVID-19 pandemic: A rapid umbrella review of systematic reviews. *J Health Soc Sci.* 2021;6(2):209–220.
23. Pollock A, Campbell P, Cheyne J, et al. Interventions to support the resilience and mental health of frontline health and social care professionals during and after a disease outbreak, epidemic or pandemic: A mixed methods systematic review. *Cochrane Database Syst Rev.* 2020;11:CD013779.
24. Frias A, Samarasinghe S. Strategies to support the mental health and well-being of health and care workforce: a rapid review of reviews. *Front Med.* 2025;12:1530287.
25. Khosravi M, Ghiasi Z, Ganjali A. A narrative review of research on healthcare staff's burnout during the COVID-19 pandemic. *Proc Singap Healthc.* 2021;31(4):1–8.
26. Aliakbari F, Shabani LE, Dehghan-Abnavi S, Sahebi A, Sheikhbardsiri H. Factors affecting burnout in Iranian healthcare workers during COVID-19: a systematic review. *Disaster Emerg Med J.* 2023.
27. Kwon CY, Lee B. Systematic Review of Mind–Body Modalities to Manage the Mental Health of Healthcare Workers during the COVID-19 Era. *Healthcare.* 2022;10(6):1027.
28. Neil-Sztramko S, Belita E, Hopkins S, et al. What are effective strategies to respond to the psychological impacts of working on the frontlines of a public health emergency? *Front Public Health.* 2023;11:1282296.
29. Kunjavara J, George R, M.L., Sam ST, Mannethodi K. Unbreakable in Crisis: A Systematic Review Exploring Nurse Resilience and Contributing Factors During the COVID-19 Pandemic. *Public Health Challenges.* 2025.

1. Hannemann J, Abdalrahman A, Erim Y, et al. The impact of the COVID-19 pandemic on the mental health of medical staff considering the interplay of pandemic burden and psychosocial resources—A rapid systematic review. *PLoS One.* 2022;17:e0264290.

