

Exploring the effects of occupational stress on healthcare workers' wellbeing during the COVID-19 pandemic: A scoping review

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Abstract

Background: The COVID-19 pandemic placed frontline healthcare workers (HCWs) under unprecedented occupational stress. Understanding the impact of such stress on this population is critical given their exposure to high-risk working conditions during public health emergencies.

Objective: This scoping review examined available evidence on the impact of occupational stress on the wellbeing of healthcare workers during the COVID-19 pandemic.

Methods: A structured scoping review was conducted across four electronic databases; CINAHL, PubMed, Medline Ovid, and EMBASE; alongside Google Scholar. Following PRISMA guidelines, 29,057 articles were identified, of which 27 met the inclusion criteria for final review.

Results: Anxiety, depression, post-traumatic stress disorder (PTSD), burnout, peritraumatic distress, alexithymia, poor sleep quality (insomnia), and general psychological distress were reported as key impacts of occupational stress. Frontline workers; particularly nurses, midwives, and physicians, showed disproportionately higher rates of these outcomes.

Conclusion: The complex working conditions during COVID-19 significantly compromised the psychological and physical wellbeing of HCWs globally. The review recommends evidence-based interventions, policy reforms, and organisational support mechanisms to protect HCW wellbeing in future health crises.

Keywords: Healthcare Workers; Well-Being; Anxiety; Depression; Coronavirus; COVID-19; Occupational Stress; PTSD; Burnout

1. Introduction

The year 2019 concluded with the emergence of a novel coronavirus (SARS-CoV-2) in Wuhan, China, which the World Health Organisation (WHO) declared a Public Health Emergency of International Concern on January 30, 2020, and subsequently a pandemic on March 11, 2020 (Harapan et al., 2020; Sohrabi et al., 2020). The outbreak exposed systemic weaknesses in global health infrastructure, particularly the uneven distribution of healthcare personnel and inadequate care infrastructure (Oliveira et al., 2020).

Healthcare workers (HCWs) were positioned at the epicentre of the pandemic response. Their roles demanded continuous patient interaction, high-intensity decision-making, irregular working hours, and exposure to physical and psychological risk, all well-established drivers of occupational stress (Basu et al., 2017; Bezerra et al., 2019). Prior to

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COVID-19, occupational stress was already recognised as a significant challenge for HCWs across multiple settings, with pooled prevalence rates of up to 52.5% reported in some regions (Girma et al., 2021).

The pandemic dramatically amplified these pre-existing stressors. A study involving 1,649 HCWs from 59 countries found that 81% experienced moderate stress and 14.73% experienced severe stress during the pandemic (Aisa et al., 2022). Furthermore, the consequences of occupational stress during COVID-19 extended beyond individual wellbeing, affecting workforce retention, patient care quality, and health system resilience.

Despite growing literature on HCW experiences during COVID-19, comprehensive evidence syntheses specifically examining the impact of occupational stress on HCW wellbeing remain limited. This scoping review addresses this gap by systematically examining available evidence on the psychological, physical, and emotional impacts of occupational stress among HCWs during the COVID-19 pandemic.

1.1. Research Questions

The primary review question was: What is the impact of occupational stress on the wellbeing of healthcare workers during the COVID-19 pandemic?

Secondary questions included: (1) What are the major physical and psychological stressors behind the high cases of occupational stress for HCWs during COVID-19? (2) What measures can be adopted to reduce the impact of occupational stress on HCWs?

2. Literature review

Occupational stress among HCWs is not a new phenomenon. Studies conducted prior to COVID-19 established that healthcare environments are characterised by persistent stressors, including high patient workloads, interpersonal complexity, and moral distress arising from resource constraints (Martinez et al., 2019; Montenegro et al., 2016). These stressors have historically contributed to burnout, anxiety, depression, and impaired immune function among HCWs (Zhang et al., 2020; Shiozaki et al., 2017).

The experience of previous epidemics, including SARS, MERS, and Ebola, demonstrated that HCWs are particularly vulnerable to psychopathological symptoms during infectious disease outbreaks (Pinchuk et al., 2021). During SARS, for instance, 10% of medical personnel in Beijing hospitals and 11% of nurses in Taiwan reported PTSD symptoms (Wu et al., 2009; Chen et al., 2005). These findings underscored the occupational and psychological risks inherent in frontline pandemic work.

The COVID-19 pandemic substantially worsened these outcomes. High stress scores were registered among HCWs in the United States (Prasad et al., 2021), and findings were consistent across diverse international settings, reflecting the pandemic's global reach. Occupational stress manifested across a spectrum of psychological disorders including depression, anxiety, PTSD, and burnout, with nurses frequently identified as the most affected professional group due to their close and sustained patient contact (Mauder et al., 2004; Holton et al., 2020).

The role of personal protective equipment (PPE) also emerged as a stressor in its own right. A study by Aloweni et al. (2022) found that 53.8% of HCWs reported PPE-related adverse effects; including inaccurate sizing and inadequate supply, which increased workplace pressure. Additionally, cognitive behavioural training and physical relaxation have been shown to moderately reduce stress in HCWs, though evidence for effective interventions during humanitarian crises remains limited (Marine et al., 2006; Faculo, 2022).

3. Methodology

3.1. Study Design

A scoping review methodology was employed following the framework established by Grant and Booth (2009) and aligned with PRISMA reporting guidelines. This approach was selected to map the breadth of available evidence on occupational stress impacts on HCW wellbeing, without the restrictive quality-weighting of systematic reviews.

3.2. Search Strategy

The search strategy was developed using the PICO model (Table 1). Search terms were generated for each PICO component and combined using Boolean operators (AND/OR).

Table 1 PICO Framework for Search Strategy Development

Component	Element	Search Terms (examples)	Operator
P – Population	Healthcare Workers	Nurses, Doctors, Paramedics, Frontline workers	OR
I – Intervention	Occupational Stress	Work stress, Job demands, Burnout, Workload	OR
C – Control	No specific control	—	—
O – Outcome	Wellbeing	Mental health, Anxiety, Depression, Quality of life	OR

3.3. Database Search

Four electronic databases were searched: CINAHL, PubMed, Medline Ovid, and EMBASE. Grey literature, government publications, and Google Scholar were also consulted to broaden retrieval (Pappas and Williams, 2011).

3.4. Inclusion and Exclusion Criteria

Studies were included if they: (1) were published between 2019 and 2022; (2) were written in English; (3) used qualitative, quantitative, or mixed methods; (4) studied HCW psychological experiences directly related to COVID-19-induced occupational stress; and (5) were from any global location. Systematic, scoping, and narrative reviews were excluded.

3.5. Study Selection and Quality Appraisal

Titles, abstracts, and full texts were assessed against the inclusion criteria. Quality appraisal was conducted using the Cochrane Collaboration Back Review Group checklist (Van Tulder et al., 1997), adapted to accommodate the study designs included. Studies scoring 5–9 points were classified as high quality; those scoring 4 or below as low quality.

4. Results

4.1. Study Selection

A total of 29,057 records were identified from database and supplementary searches. Following removal of 12,300 duplicates and application of inclusion/exclusion criteria, 27 studies were included in the final review (Figure 1). Of these, 26 were quantitative and 1 was qualitative.

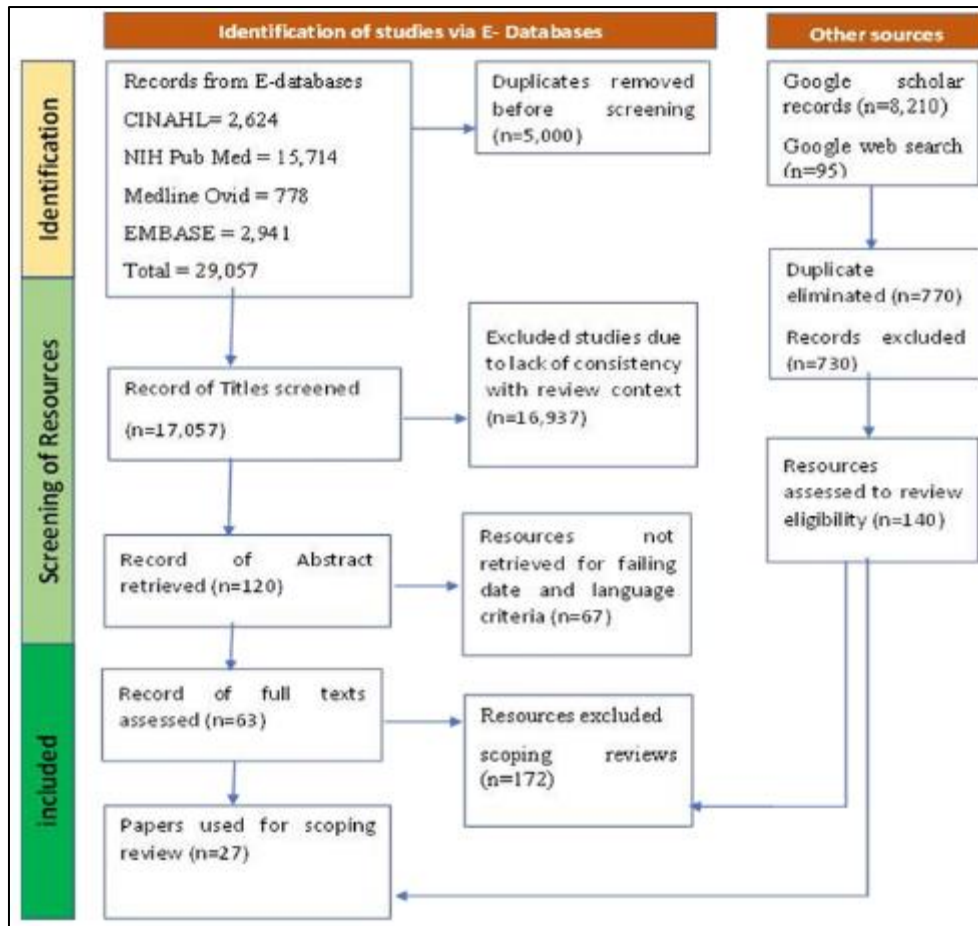


Figure 1 PRISMA Flow Diagram Summary

4.2. Characteristics of Included Studies

Studies were conducted across 17 countries spanning five continents, with six studies from China. Other study locations included Australia, Italy, the United States, Iran, Spain, Romania, Hungary, South Africa, Tunisia, Malaysia, India, Palestine, Turkey, Poland, Switzerland, and Cyprus. Table 2 summarises the key psychological outcomes reported.

Table 2 Summary of Psychological Outcomes Reported Across Included Studies

Outcome	No. of Studies	Key Findings	Most Affected Group
PTSD	4	Prevalence 9.1%–27.39%; correlated with burnout and workload	Nurses, physicians
Burnout Syndrome	7	Rates ranged from 48%–65% across settings	Nurses, doctors
Anxiety & Depression	8	Anxiety: 28%–68%; Depression: 44%–60%+	Nurses, frontline HCWs
Peritraumatic Distress	3	58.1% exhibited clinically significant levels	ICU workers
Psychological Distress	5	Prevalence of general psych. problems: 56.59%	Nurses, public health workers
Alexithymia	1	Positive correlation between stress and alexithymia, stronger in nurses	Nurses
Insomnia / Poor Sleep	2	65.86% prevalence of poor sleep quality	Nurses, younger HCWs (20–40 yrs)

4.3. Post-Traumatic Stress Disorder (PTSD)

Four studies examined PTSD among HCWs. Fateminia et al. (2022) reported a strong correlation between PTSD and occupational burnout among Iranian nurses ($r=0.363$, $p<0.001$). Song et al. (2020) found PTSD prevalence of 9.1% among 14,825 Chinese emergency department workers, with higher risk among those with longer work hours and lower social support. Li et al. (2020) reported that healthcare workers deployed to Wuhan experienced high rates of depression (46.7%), anxiety (35.6%), and stress (16.0%), with PTSD symptoms increasing upon return home. De Pasquale et al. (2022) identified rapid emotional exhaustion and dissociative symptoms consistent with burnout syndrome among Italian healthcare professionals.

4.4. Burnout Syndrome

Seven studies reported burnout as a major consequence of occupational stress. Klein et al. (2021) found 65% job-stress-related burnout among Romanian physicians — a 10% increase compared to pre-pandemic levels. Hajebi et al. (2022) reported a 48% burnout rate among Iranian HCWs, with female workers and hospital-based staff significantly more affected. In Turkey, Sengul et al. (2021) identified burnout in 52% of participants, with workload ($B=1.2$, $p<0.05$) and unsafe work environment ($B=1.04$, $p<0.05$) as primary predictors.

4.5. Anxiety and Depression

Multiple studies reported elevated anxiety and depression among frontline HCWs. Magnavita et al. (2021) observed that over 60% of workers in a Roman COVID-19 hub hospital exhibited depressive symptoms, with occupational stress as a significant predictor of anxiety and intention to leave ($p<0.001$). Holton et al. (2020) found that Australian nurses and midwives recorded significantly higher anxiety scores compared to doctors and allied health staff ($p<0.001$). Que et al. (2020) reported anxiety prevalence of 46.04% and depression of 44.37% across different HCW categories, with nurses showing the highest burden (62.02%).

4.6. Peritraumatic Distress

Three studies examined peritraumatic distress. Jang et al. (2021) identified that worry about stigma ($B=2.96$, $p<0.001$), fear of infection ($B=0.89$, $p<0.001$), and pressure from pandemic combat duties ($B=0.56$, $p<0.01$) were significant predictors. Wozniak et al. (2021) found that 22% of ICU workers in Switzerland reported peritraumatic distress, alongside changes in eating habits and alcohol consumption. Qi et al. (2022) found that 58.1% of frontline Chinese HCWs exhibited clinically significant peritraumatic stress symptoms.

4.7. Poor Sleep Quality

Munjappa et al. (2022) reported that 137 of 208 HCWs (65.86%) experienced poor sleep quality (PSQI score >5), with nurses and younger workers (20–40 years) most affected. Chatterjee et al. (2021) corroborated these findings in an Indian sample, identifying quarantine as a significant predictor of insomnia and noting that doctors experienced anxiety more than other HCW categories.

4.8. Alexithymia

Warchol-Biedermann et al. (2022) conducted the only study examining alexithymia, finding a positive relationship between occupational stress and alexithymia among Polish medical staff, with a stronger association among nurses than physicians (difference in beta=0.27, $p<0.05$). This finding is consistent with earlier work by De Vente et al. (2006), which identified occupational stress as a key risk factor for alexithymia.

5. Discussion

The findings of this scoping review confirm that the COVID-19 pandemic substantially amplified occupational stress among healthcare workers globally, generating a spectrum of psychological and physical harms. The review identified seven distinct categories of impact: PTSD, burnout, anxiety and depression, peritraumatic distress, general psychological distress, alexithymia, and insomnia.

Consistent with existing literature, nurses and frontline workers were disproportionately affected across nearly all outcome categories (Maunder et al., 2004; Que et al., 2020). This can be attributed to their sustained proximity to COVID-19 patients, exposure to high viral load environments, and personal protective equipment challenges (Aloweni et al., 2022). The finding that HCWs not actively participating in COVID-19 care reported fewer psychological symptoms further reinforces the dose-response relationship between occupational exposure and psychological harm.

Burnout emerged as the most consistently reported outcome, affecting up to 65% of participants in some studies (Klein et al., 2021). This resonates with pre-pandemic research; for instance, a UK study among 500 physicians reported similar burnout surges during non-pandemic periods of high stress (Sharma et al., 2008). The pandemic, however, accelerated and concentrated burnout to an unprecedented degree within a compressed timeframe.

PTSD rates varied considerably across studies (9.1%–27.39%), reflecting differences in exposure intensity, sample characteristics, and measurement tools. Notably, PTSD prevalence during COVID-19 far exceeded historical benchmarks from SARS (10–11%), suggesting that the scale and duration of COVID-19 exposure intensified trauma responses among HCWs (Wu et al., 2009; Chen et al., 2005).

The identification of alexithymia and peritraumatic distress as pandemic-related outcomes adds important nuance to the evidence base. Alexithymia; a subclinical difficulty in identifying and processing emotions, may impair HCWs' capacity for effective self-regulation, compounding the risk of longer-term psychological sequelae. Peritraumatic distress, meanwhile, represents an immediate emotional response to traumatic exposure and is a well-established precursor to PTSD (Jang et al., 2021).

Insomnia constituted another notable impact, with prevalence rates approaching 66% in some studies. Sleep disturbance is well-documented as both a consequence of occupational stress and a risk factor for broader psychological deterioration (Sredniawa et al., 2019). Its high prevalence among younger nurses warrants targeted workplace sleep health interventions.

A significant limitation of the evidence base is the predominance of cross-sectional designs, which preclude causal inference. Furthermore, over-reliance on self-report instruments introduces potential recall and social desirability bias. Geographic representation was skewed towards China and Europe, limiting global generalisability. These limitations inform the recommendations below.

6. Conclusion

This scoping review provides robust evidence that the COVID-19 pandemic substantially compromised the wellbeing of frontline healthcare workers through elevated occupational stress. Seven distinct psychological and physical impacts were identified across 27 international studies: PTSD, burnout, anxiety, depression, peritraumatic distress, alexithymia, insomnia, and general psychological distress. These impacts were not geographically confined but reflected a global pattern driven by the universality of the stressors; high workload, unsafe work environments, fear of infection, social isolation, and resource scarcity.

Nurses, midwives, and physicians emerged as the most vulnerable groups, particularly those working in ICUs and COVID-19-designated facilities. The review also found that HCWs who were not actively engaged in COVID-19 patient care reported significantly fewer psychological symptoms, reinforcing the role of direct occupational exposure in mediating psychological harm.

Despite growing evidence of impact, the review identified a critical gap in documented organisational and policy-level responses designed to protect HCW wellbeing during the pandemic. This gap represents both a failure of preparedness and an opportunity for evidence-based reform ahead of future health emergencies.

Recommendations

Based on the review findings, the following recommendations are proposed:

- Establish mental health infrastructure: Healthcare organisations should implement psychological first aid programmes, peer support networks, and access to clinical psychological services specifically tailored for HCWs during public health emergencies.
- Develop pandemic preparedness protocols: Policies should include provisions for workload redistribution, mandatory rest periods, and rotation schedules to prevent burnout accumulation during prolonged crises.
- Improve transparent communication: Leaders should provide timely, evidence-based updates to HCWs to reduce uncertainty — a documented driver of occupational stress (Shanafelt et al., 2020).
- Ensure adequate PPE and resource supply: PPE shortfalls were consistently identified as stressors. Organisations and governments must build strategic reserves and improve distribution systems ahead of future outbreaks.

- Target high-risk subgroups: Nurses, ICU workers, and younger HCWs require tailored interventions. Sleep health programmes, emotional processing support, and alexithymia screening should be integrated into occupational health frameworks.
- Invest in longitudinal research: Future studies should adopt longitudinal designs and multi-rater assessment tools to establish causal relationships and evaluate intervention efficacy over time.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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