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THE MULTIFACTORIAL NATURE OF OCCUPATIONAL STRESS IN HEALTHCARE PROFESSIONALS: A SCOPING REVIEW

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Abstract

Occupational stress and burnout critically threaten healthcare professionals' (HCPs) well-being and patient care quality, a situation significantly exacerbated post-pandemic. Synthesizing contemporary risk factors is essential for effective interventions. This scoping review systematically maps empirical literature (January 2021-December 2025) identifying the multifactorial determinants of stress and/or burnout among doctors and nurses. Following PRISMA-ScR guidelines, PubMed and Wiley databases were searched. Data from 25 eligible primary research articles in English underwent narrative synthesis and thematic analysis. Analysis confirmed the complex, multifactorial nature of HCP stress/burnout. Four major interconnected themes of risk factors were identified: (1) Workload and Job Demands (quantitative overload like excessive hours, and qualitative pressures including high emotional/cognitive labor); (2) Organizational Factors and Resources (deficits like inadequate staffing/support, low job control, effort-reward imbalance, poor leadership/communication); (3) Individual Factors (demographics, health status, sleep quality, personality traits, coping strategies); and (4) Pandemic Context (unique stressors like infection fear, resource scarcity, ethical dilemmas). The findings highlight a critical interplay between demanding work conditions, inadequate organizational support, individual vulnerabilities, and crisis contexts, underscoring the need for multi-level interventions addressing systemic, organizational, and individual factors to mitigate HCP stress and burnout.

Keywords: Burnout, Healthcare Professionals, Occupational Stress

INTRODUCTION

Healthcare professionals, including physicians and nurses, constitute a fundamental pillar of the global healthcare delivery system, whose well-being is intrinsically linked to the quality of patient care, patient safety, and the overall stability of the health system (World Health Organization [WHO], 2022). Despite their essential roles, professionals in the health sector are consistently exposed to high-pressure work environments, rendering occupational stress and burnout persistent critical challenges (Hosseini et al., 2024; Hu et al., 2023). This phenomenon not only jeopardizes the physical and mental health of these professionals themselves but also precipitates detrimental systemic consequences, including an increased risk of medical errors,

diminished quality of service, and high staff turnover rates, which contribute to the global healthcare workforce shortage crisis (Dyrbye et al., 2022; National Academies of Sciences, Engineering, and Medicine, 2021).

Occupational stress is defined as the physical and emotional responses that arise when job demands exceed the individual's capacity, resources, or needs to cope (WHO, n.d.-b). For healthcare professionals, these stressors are often unique and multifaceted, encompassing both quantitative (long work hours, high patient volume) and qualitative (case complexity, emotional demands) workload aspects, exposure to trauma and death, and high clinical responsibility (Hu et al., 2023; Iwasaki et al., 2023; Kumar & Jin, 2021). Conversely, burnout, formally recognized in the ICD-11 as an occupational phenomenon resulting from chronic workplace stress that has not been successfully managed, is manifested through three core dimensions: (1) profound emotional exhaustion, (2) increased mental distance from one's job or feelings of cynicism and negativism (depersonalization), and (3) reduced professional efficacy or sense of personal accomplishment (WHO, 2019). Distinguishing these two concepts is important; stress is often characterized by overengagement and hyperactivity, whereas burnout tends to involve disengagement, exhaustion, and loss of motivation (Parker & Tavella, 2021).

The prevalence of occupational stress and burnout among healthcare professionals has reached alarming levels globally, with a significant escalation documented during and after the acute phase of the COVID-19 pandemic (Babić et al., 2021; Bellanti et al., 2022; Denning et al., 2021). Data from the 2021-2025 period consistently report high rates across various parts of the world. Studies in Poland, for example, identified significant occupational burnout among healthcare workers during the pandemic (Izdebski et al., 2022; Tomaszewski et al., 2021). In the United States, although physician burnout rates showed a slight decrease from their peak (62.8% in 2021) to 48.2% in 2023, this figure remains historically high (American Medical Association, 2024). Similarly, studies in Southeast Asia (Millett et al., 2024) and specific contexts like Argentina (Ibar et al., 2022) and Serbia (Živanović et al., 2022) report substantial psychological burdens. In Indonesia, research from the same period also confirms significant stress and burnout, such as a 22.0% burnout prevalence in Malang (Afiati et al., 2022) and reports of high stress in various regions (Lasminingrum et al., 2023), highlighting the urgent need for a deep understanding of the contributing factors within local and global contexts.

Understanding the etiology of occupational stress and burnout in healthcare professionals requires adopting a multifactorial perspective, as articulated in frameworks such as the Person-Environment-Occupation (PEO) model (Law et al., 1996) or the Job Demands-Resources (JD-R) model (Bakker & Demerouti, 2017). These models emphasize that stress and burnout arise from the dynamic and complex interaction between various elements. This includes high job demands (e.g., excessive workload

[Quan et al., 2022], time pressure, emotional demands [Kumar & Jin, 2021]), limitations in job and organizational resources (e.g., lack of control or autonomy [Tucak Junaković & Macuka, 2021], minimal social support from colleagues or superiors [Wu et al., 2021], staff shortages [Kishi et al., 2022], unsupportive organizational culture), physical environment and safety factors (e.g., risk of infection, inadequate facilities), as well as individual factors (e.g., age, work experience, personality traits [Hacımusalar et al., 2023], coping strategies, personal resilience). Crisis contexts, such as the COVID-19 pandemic, act as a significant additional layer of stressors, introducing unique challenges like fear of infection, social stigma, issues related to personal protective equipment (PPE), abrupt changes in work roles, and intense ethical dilemmas (Bellanti et al., 2022; Fathuse et al., 2023; Živanović et al., 2022).

Although extensive literature has documented the prevalence and consequences of occupational stress and burnout, and explored various causal factors separately or in specific contexts, there is an urgent need for a comprehensive and up-to-date mapping of the full spectrum of causal factors based on empirical evidence from the 2021-2025 period. This period is particularly crucial as it encompasses the ongoing impacts of the COVID-19 pandemic and new dynamics within the healthcare work environment. Existing systematic reviews often focus on intervention effectiveness or highly specific populations/factors. Therefore, a broad mapping of the recent primary literature concerning the causes or risk factors for stress and burnout remains lacking. The scoping review methodology is highly suitable for this purpose, as it allows for a broad exploration of a research area, mapping key concepts, identifying sources and types of evidence, and determining gaps in the literature without being constrained by narrow research questions or the rigorous quality appraisal typical of traditional systematic reviews (Arksey & O'Malley, 2005; Tricco et al., 2018).

In line with this need, the primary objective of this scoping review is to systematically map and synthesize empirical literature published from January 2021 to December 2025 that identifies factors contributing to occupational stress and/or burnout among healthcare professionals (physicians and nurses). More specifically, this review aims to: (1) Identify the range of factors contributing to occupational stress and burnout in healthcare professionals reported in the recent primary literature; and (2) Categorize these factors into four main thematic domains identified through preliminary analysis: (a) Workload and Job Demands; (b) Organizational Factors, Work Environment, and Resources; (c) Individual Factors, Coping, and Personal Characteristics; and (d) Pandemic Context and Crisis-Specific Stressors.

By providing a structured narrative synthesis of the current evidence on the multifactorial etiology of occupational stress and burnout in healthcare professionals, this scoping review is expected to make a significant contribution. Its findings can inform the development and implementation of more holistic and evidence-based prevention and intervention strategies at the policy, organizational, and individual

levels. Furthermore, this mapping will highlight areas where evidence is still limited or ambiguous, thereby guiding future research agendas to address knowledge gaps and ultimately enhance the well-being of healthcare professionals and the quality of healthcare systems globally.

RESEARCH METHOD

This scoping review aims to provide an overview of recent studies examining the relationship between workload exposure and the occurrence of occupational stress among healthcare professionals. The PEO (Population, Exposure, Outcome) framework was used to formulate the research question. PEO involves a systematic analysis of causes and risks to determine the relationship between exposure and health outcomes (Hosseini et al., 2024). Based on the PEO framework, the following research question was formulated: "Do excessive workload and high job demands increase the risk of work-related stress and burnout among healthcare workers?".

Table 1. PEO Framework

P (Population)	E (Exposure)	O (Outcome)
Healthcare professionals (physicians, nurses)	● Excessive workload (overwork) ● High job demands	Occupational stress and burnout

This scoping review was conducted following the PRISMA-ScR (PRISMA extension for Scoping Reviews) guidelines (Tricco et al., 2018).

1. Protocol and Registration
   This scoping review utilized the PRISMA-ScR protocol and its corresponding 22-item checklist (Tricco et al., 2018).
2. Eligibility Criteria
   The inclusion and exclusion criteria used in this scoping review are outlined below (See Table 2).

Table 2. Inclusion and Exclusion Criteria

Inclusion	Exclusion

- Research articles
- Subjects are healthcare professionals
- Published in English
- Published within the date range of 2021-2025

- Review articles
- PEO framework not applicable/addressed
- Article not fully accessible or not published in English
- Published before 2021

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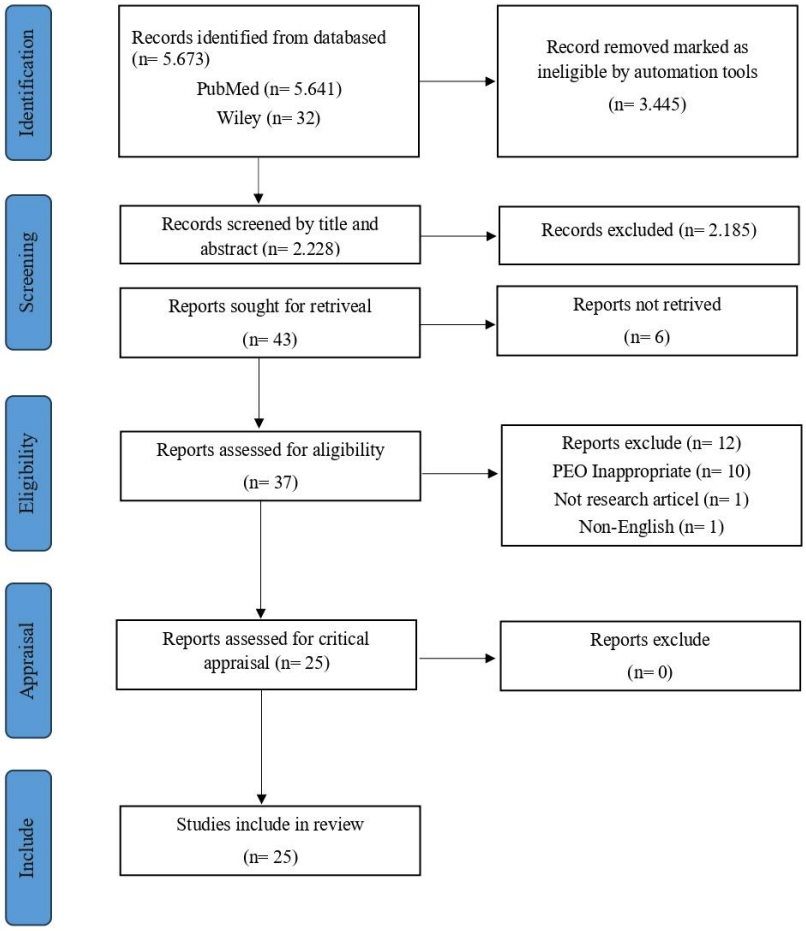
3. **Information Sources**
   The search for articles in the scoping review was carried out using 2 databases, namely PubMed and Wiley.
4. **Search**
   Predefined keywords were entered into the databases using Boolean operators. The search string utilized the following keywords and Boolean operators: ((healthcare workers) OR (medical staff) OR (nurses) OR (hospital staff)) AND ((overwork) OR (work overload) OR (excessive workload)) AND ((work-related stress) OR (burnout) OR (emotional exhaustion)) AND (occupational health)
5. **Selection of sources of evidence**
   The search across the PubMed and Wiley databases yielded 5,673 articles. Of these, 3,445 were marked as ineligible and excluded using automation tools. A total of 2,228 articles were screened based on title and abstract relevance, resulting in 43 potentially relevant articles. Subsequently, 6 articles were excluded due to lack of full-text access, leaving 37 articles for eligibility assessment. A total of 25 articles met the inclusion criteria for analysis in the scoping review. The overall results of the article screening process are presented in the PRISMA-ScR flowchart (Figure 1).



Gambar 1. PRISMA ScR Flowchart

5. Data Charting Process

No.	Title	Author	Study Design	Sample Size	Result
1.	Workplace Social Support as a Mediating Factor in the Association between Occupational Stressors and Job Burnout: A Study in the Taiwanese Nursing Context	Wu et al	Cross sectional	500 nurses	A study of 500 nurses in Taiwan showed 7.2% experienced severe personal burnout, 5% work-related burnout, and 4.8% patient-related burnout. SEM analysis revealed work stress had a significant direct effect on burnout (β=0.55, p<0.001), with workload and work-family conflict as the main contributors.

					Data showed 53.4% of nurses with ≤5 years of experience were more prone to burnout, while the emergency department showed the highest burnout rate (55.32).
2.	Burnout of Healthcare Workers Based on the Effort-Reward Imbalance Model: A Cross-Sectional Study in China	Yuan et al	Cross sectional	1,505 health workers	Reward imbalance (ERI) was the main cause of stress, with high effort (β=1.101) and low reward (β=-1.277) significantly triggering *emotional exhaustion* (correlation: 0.593) and *cynicism*. Healthcare workers with workload >70 hours/week and low income (<5,000 RMB) reported the highest level of emotional exhaustion (3.11 ± 0.05 vs. 1.17 ± 0.05 in the low ERI group).
3.	Impact of nurses' roles and burden on burnout during the COVID-19 pandemic: Multicentre cross-sectional survey	Kishi et al	Cross-sectional	895 nurses	Nurses caring for suspected COVID-19 cases experienced significantly higher levels of stress in the aspects of 'infection concern' (β=0.921, p=0.004) and emotional exhaustion (β=0.136, p=0.021) than those caring for confirmed cases. Additional workloads such as strict isolation and uncertainty of patient infection status were the main triggers.
4.	The occupational burnout among	Sun et al	cross-sectional	1,505 health	The study involved 1,505 health workers (doctors

	medical staff with high workloads after the COVID-19 and its association with anxiety and depression			workers (731 doctors and 774 nurses)	and nurses) post-COVID-19 and revealed that high workload was the main cause of stress, with 52.4% experiencing emotional exhaustion (EE). Doctors were more affected (61.1%) than nurses (44.1%), mainly due to the demands of working hours that exceeded the regulations (*HR=1.686*). Other factors such as lack of psychological support (*HR=1.462*) and poor relationships with family (*HR=1.911-2.395*) also exacerbate burnout. In addition, poor health and lack of sleep increased the risk of burnout by 2-3 times (*HR=1.843-2.863*).
5.	Occupational Burnout in Healthcare Workers, Stress and Other Symptoms of Work Overload during the COVID-19 Pandemic in Poland	Izdebski et al	Cross-sectional	2,196 health workers	Healthcare workers in Poland experienced significant levels of burnout during the COVID-19 pandemic, with several key stressors identified. Increased workload was experienced by 34.7% of respondents and increased the risk of burnout by 1.4 times. Work-related trauma was reported by 33% of health workers, especially in paramedics (41.3%) and nurses (36.2%), which contributed to an almost 2-fold increase in burnout risk. In addition, high stress levels were found

					in 55.1% of respondents and were the strongest predictor of burnout by increasing the risk by 3.9 times. Among all professions, nurses showed the highest burnout rate (36.5%), driven by extra workload and constant exposure to stress during the pandemic.
6.	Burnout and stress in group of psychiatrists: workload and non-professional-social predictors	Wontorczyk et al	Cross sectional	131 psychiatrists	Occupational stress in psychiatrists was mainly triggered by two main factors, namely psychophysical exhaustion and lack of a sense of professional efficacy. Regression analysis showed that psychophysical exhaustion contributed significantly to stress levels, explaining 48% of the variance ($\beta=0.48$, $p<0.001$). In addition, the high workload with an average of 55.46 hours per week contributed to the stress condition although it was not statistically significant. This study also identified several protective factors that can reduce stress, such as taking regular leave (at least 3 times a year) which lowers stress levels ($\beta=-0.27$) and having a stable family or partner relationship ($\beta=-0.11$).

7.	Stress and Occupational Burnout of Nurses Working with COVID-19 Patients	Tomaszewska et al	Cross sectional	118 nurses	Nurses working with COVID-19 patients experience significant levels of stress and burnout. The main factors causing stress were high workload (reported by 65.3% of respondents) and great responsibility for the lives of patients (72% of respondents). This condition was exacerbated by staff shortages due to COVID-19 experienced by 93.2% of respondents, causing increased workload and triggering burnout symptoms such as anxiety (48.3%) and headaches (39%). The mean burnout score as measured by the MBI reached 55.67 points, with the emotional exhaustion dimension recording the highest score (24.74 points), demonstrating the significant impact of a high-risk work environment on nurses' mental health.
8.	Identifying the Influencing Factors of Depressive Symptoms among Nurses in China by Machine Learning: A Multicentre Cross-Sectional Study	Li et al	Cross - sectional	1,431 nurses	Chinese nurses experienced high levels of depressive symptoms, reaching 31.9%. The main occupational stressors identified included sleep disturbance, chronic fatigue and physical exhaustion, which significantly contributed

					to the onset of depressive symptoms. In addition, lack of organizational support and burnout exhaustion exacerbated the problem, especially among nurses with low income (below 6,000 yuan) and those with chronic illnesses (23.5%). These findings are supported by the results of machine learning analysis, which showed high prediction accuracy (AUC 0.871-0.895), indicating that these factors play an important role in influencing nurses' mental health.
9.	Analysis of job burnout, satisfaction and work-related depression among neurological and neurosurgical nurses in Poland: A cross-sectional and multicentre study	Ślusarz et al	Cross sectional	206 neurology and neurosurgery nurses	Neurology and neurosurgery nurses in Poland experienced significant levels of burnout, with 44.2% experiencing coworker-related burnout, especially in neurology units where the risk was 3.53 times higher than neurosurgery. Age and work experience also played an important role, with nurses over 54 years old being 4.8 times more prone to work-related burnout. In addition, long work commutes (>59 km) exacerbate this condition, reducing job satisfaction and increasing the risk of coworker-related

					burnout. These findings were supported by logistic regression analysis which showed statistical significance (OR: 0.19-0.20; p<0.01), indicating that work environment and personal factors contributed significantly to nurses' job stress.
10.	Job demands, job control, and social support as predictors of job satisfaction and burnout in Croatian palliative care nurses	Tucak Junaković & Macuka	Cross-sectional study (online questionnaire)	68 nurses	Causes of job stress and burnout in Croatian palliative nurses included high job demands, which correlated with burnout; this effect was mitigated by high social support (interaction β=0.39; p<0.01). Low job control was also a contributing factor, which was significantly associated with higher levels of disengagement (β=-0.45; p<0.01).
11.	High levels of burnout among health professionals treating COVID-19 patients in two Nile basin countries with limited resources	EL Dabbah & Elhadi	Cross-sectional survey (online questionnaire)	362 health workers (181 Egypt, 181 Sudan)	Job stress among health workers in Egypt during the COVID-19 pandemic was significantly predicted by longer weekly working hours (β=0.044, p=0.031). In Sudan, older age (β=0.230, p=0.022) and fewer days off (β=-2.155, p<0.001) were significant predictors of burnout.
12.	"Why Am I Even	Fathuse et	Qualitative	10 doctors	The main cause of stress

	Here If I Can't Save the Patients?": The Frontline Healthcare Workers' Experience of Burnout during COVID-19 Pandemic in Mthatha, South Africa	al.	study (exploratory design, in-depth face-to-face interviews)	& nurses	and burnout in frontline health workers in Mthatha, South Africa during COVID-19 was occupational exposure to high patient mortality rates, which created constant anguish. Other contributing factors were severe staff shortages, high patient volumes over long periods, and heavy workloads, as well as uncertainty related to the disease itself.
13.	Workload, General Perceived Stress, Body Function, Musculoskeletal Pain, and Their Mutual Relationships in Nurses - A Pilot Study	Masłoń et al.	Pilot Study (Cross-sectional, questionnaire & physical examination)	42 female nurses	In nurses in Poland, perceived general stress was significantly correlated with chronic chest/thoracic pain ($r=-0.43$, $p<0.01$). High job demands, especially perceived temporal (Mean=16.7), mental ($r=0.42$, $p<0.05$) and physical ($r=0.35$, $p<0.05$) demands, were associated with increased diaphragm tension (thoracic compression test), indicating work overload as a contributor to physical and psychological stress.
14.	Impact of Nurses' Emotional Labor on Job Stress and Emotional Exhaustion amid COVID-19: The Role of Instrumental	Kumar & Jin	Longitudinal design	319 nurses	Emotional labor in the form of surface acting significantly caused occupational stress in nurses in Pakistan during the COVID-19 emergency ($\beta=.304$, $p<.01$ in the

	Support and Coaching Leadership				intervention phase). This effect of stress was moderated by support factors; low instrumental support and lack of coaching leadership exacerbated the relationship between emotional labor, stress, and burnout.
15.	The COVID-19 pandemic – related psychological distress and job burnout among Serbian pharmacy practitioners: a cross-sectional online study	Živanović et al.	Cross-sectional online study	176 pharmacy practitioners	High psychological distress was the main cause of burnout in Serbian pharmacy practitioners during the COVID-19 pandemic, with strong positive correlations between distress and all burnout subscales (Personal, Work-related, Client-related; all $r > 0.68$, $p < 0.001$). Shorter sleep duration due to distress also significantly mediated this relationship, suggesting that sleep-disrupting stress is an important pathway to burnout.
16.	Evaluation of stress, burnout and hair cortisol levels in health workers at a University Hospital during COVID-19 pandemic	Ibar et al.	Cross-sectional	234 health workers	Perceived stress was a significant cause of burnout in healthcare workers in Argentine hospitals during the COVID-19 pandemic, as evidenced by positive correlations between perceived stress and hair cortisol levels

					(r=0.142, p=0.030) and emotional exhaustion (r=0.143, p=0.029). Perceived stress (OR=1.265, p=0.002) and hair cortisol levels (OR=1.006, p=0.047) jointly predicted burnout.
17.	Influence of Workload, Personality, and Psychological Flexibility on Occupational Stress Among Medical Staff: A Fuzzy-Set Qualitative Comparative Analysis	Quan et al.	cross-sectional	1,928 medical staff	Certain combinations of factors together lead to high occupational stress in medical staff in China. The main causes include the combination of low psychological flexibility, personality introversion, and role overload (consistency 0.88 for psychological stress; 0.90 for physical stress). Other significant combinations were introversion, neuroticism and role overload.
18.	The effects of working and living conditions of physicians on burnout level and sleep quality	Hacimusalar et al.	Cross-sectional	1053 doctors	Job stress and burnout in Turkish physicians were caused by negative working conditions such as night/call shifts, high daily number of patients, short examination time, and low income (all significantly associated with at least one burnout dimension, p<0.001 to p=0.029). In addition, experiencing physical/verbal violence and mobbing at work were

					also significant causes associated with increased burnout scores (EE, DP, PA) and poor sleep quality (p<0.001).
19.	Transitional Changes in Job Stress and Psychological Adjustment of Hospital Workers During the COVID-19 Pandemic in Japan	Yamada et al.	Longitudinal evaluation	151 employees from Tokai University Hospital Tokyo	Causes of work stress and burnout in Japanese hospital workers during the COVID-19 pandemic include factors such as the need for self-quarantine (OR 3.352, p<0.01), dealing with poor patient prognosis (OR 5.088, p<0.05), and poor communication of information at work (OR 2.913, p<0.05). Sleep deprivation compared to the pre-COVID period was also a significant cause of burnout (OR 4.054, p<0.01).
20.	Occupational Burnout Symptoms and Its Relationship With Workload and Fear of the SARS-CoV-2 Pandemic Among Hospital Nurses	Belji Kangarlou et al.	Cross-sectional	831 nurses	In hospital nurses in Iran during the pandemic, fear of COVID-19 was a significant cause of burnout, as evidenced by its correlation with emotional exhaustion (r=0.71, p=0.001), depersonalization (r=0.67, p=0.02), and personal accomplishment (r=0.63, p=0.05). In addition, perceived workload, specifically mental demands (r=0.74, p=0.01)

					and work effort (r=0.68, p=0.001), significantly contributed to emotional exhaustion.
21.	Factors Related to Nurses' Burnout during the First Wave of Coronavirus Disease-19 in a University Hospital in Italy	Bellanti et al.	Web-based cross-sectional study	293 nurses	Work stress and burnout in nurses in Italy during the first wave of COVID-19 were significantly attributed to lack of emotional support from superiors and family (β=1.457; p<0.001) and high workload and stress (β=0.753; p=0.023). Consideration of leaving the job (β=1.306; p=0.018), which may be triggered by working conditions, was also a strong predictor of burnout.
22.	Relationships between job satisfaction, occupational burnout and rationing of care among intensive care unit nurses	Tomaszewska et al.	Cross-sectional survey	477 nurse anesthetists	Care rationing by ICU nurse anesthetists in Poland was significantly, albeit weakly, positively correlated with all dimensions of burnout (Total MBI r=0.204, EE r=0.190, DP r=0.149, Lack of PA r=0.115; all p<0.05). This suggests that limitations in providing necessary care, possibly due to workload or resources, contribute to stress and burnout.
23.	Burnout, Depression, and Job Stress Factors in Healthcare	Briciu et al.	Cross-sectional survey	114 workers The Clinical Hospital of	Among health workers in Romania two years after the pandemic, high job demands (as measured by

	Workers of a Romanian COVID-19 Dedicated Hospital, after Two Pandemic Years			Infectious Diseases Cluj-Napoca	the Karasek scale) were a significant cause of stress, especially in resident doctors (Mean=22.00). This group also experienced the lowest job control (Mean=54.53), which was significantly different from the other groups ($p<0.001$), indicating a combination of high demands and low control as the main source of stress.
24.	Relationships between overwork, burnout and suicidal ideation among resident physicians in hospitals in Japan with medical residency programmes: a nationwide questionnaire-based survey	Ishikawa M.	Cross-sectional	4306 doctors	Extremely long working hours (overwork) is the main cause of extreme stress in resident physicians in Japan, which significantly increases the risk of suicidal ideation (≥100 hours/week vs <40 hours/week: OR 3.64, $p<0.01$). Other factors contributing to stress and suicidal ideation were low annual income (e.g., <12 million yen vs <2 million yen had OR <1, $p<0.05$) and working in hospitals with fewer beds (e.g., 600-799 vs <200: OR 0.23, $p=0.02$).
25.	Predictors of the Occupational Burnout of Healthcare Workers in Poland during the	Szwamel *et al*	Cross-Sectional	497 health workers	The main causes of work stress in health workers include heavy workload (71.6% experienced emotional exhaustion), minimal support such as

COVID-19 Pandemic: A Cross-Sectional Study	lack of PPE and low salary, mental problems (62.6% anxiety and 38.8% depression), and poor quality of life due to lack of rest and social support.

6. **Data Items**
   Data were extracted from each included article concerning the relationship between high workload or job demands and the occurrence of occupational stress and/or burnout in healthcare professionals.
7. **Critical Appraisal**
   Assessment of study quality was conducted using the relevant Critical Appraisal Skills Programme (CASP) checklist for cross-sectional studies. Twenty articles addressed 6 of the 8 CASP checklist questions, while 5 articles addressed all 8 questions. Therefore, all 25 articles passed the critical appraisal stage and were deemed eligible for inclusion in the scoping review analysis.
8. **Synthesis of Results**
   Following the search and screening process, 25 articles were identified as eligible and met the inclusion criteria. Critical appraisal indicated that these 25 articles generally had a low risk of bias, confirming their suitability for review in this scoping review.

RESULT AND DISCUSSION

1. Workload and Job Demands

As consistently highlighted across all 25 included studies and summarized in Table 5, workload and job demands constitute the most dominant and proximal cluster of determinants for occupational stress and burnout among HCPs. This finding strongly supports the strain pathway of the Job Demands-Resources (JD-R) model (Bakker & Demerouti, 2017). Quantitative aspects, particularly excessive work hours (overwork), demonstrate a potent negative impact. Ishikawa's (2022) large-scale study in Japan starkly revealed a dose-response relationship, with resident physicians working ≥100 hours/week facing a 3.64-fold increased risk of suicidal ideation ($p<0.01$). Similarly, longer working hours significantly predicted burnout in Egypt ($\beta=0.044$) (EL Dabbah & Elhadi, 2023), while high average hours (>55/week) exacerbated stress among Polish psychiatrists (Wontorczyk et al., 2023). Pandemic-induced workload increases were associated with a 1.4-fold higher burnout risk in Poland (Izdebski et al., 2022), where heavy workload was also identified as the primary cause of stress leading to high emotional exhaustion (71.6%) (Szwamel et al., 2022). High workload was also a key

stressor post-COVID in Romania (Sun et al., 2022) and Taiwan (Wu et al., 2021), alongside high patient volume cited in Turkey (Hacımusalar et al., 2023).

Qualitative demands exert an equally significant psychological toll. High mental demands (e.g., complexity, concentration) strongly correlate with emotional exhaustion ($r=0.74$, $p<0.01$) (Belji Kangarlou et al., 2022), while physical demands correlate with physiological stress indicators (diaphragm tension, $r=0.35$, $p<0.05$) (Masłoń et al., 2024). The burden of emotional labor, especially surface acting, directly increases job stress ($\beta=0.304$, $p<0.01$) (Kumar & Jin, 2021). Repeated exposure to patient death and trauma, an inherent occupational hazard dramatically amplified during crises, is a profound source of grief, existential stress, and burnout (Fathuse et al., 2023), with work-related trauma nearly doubling burnout risk in one Polish study (Izdebski et al., 2022). High responsibility for patient safety constantly weighs on HCPs (Tomaszewska et al., 2021), and psychophysical fatigue itself strongly predicts stress ($\beta=0.48$) (Wontorczyk et al., 2023).

The interplay between demands underscores the complexity. High job demands combined with low job control created a classic high-strain situation for Romanian residents (Briciu et al., 2023). Configurational analysis showed that high role overload interacting with individual vulnerabilities (e.g., low psychological flexibility) formed a sufficient pathway to high stress (Quan et al., 2022). Work-family conflict significantly contributes to burnout (Wu et al., 2021), while physical/chronic fatigue predicts depression (Li et al., 2022). Additional burdens like strict isolation protocols also significantly increased emotional exhaustion during the pandemic (Kishi et al., 2022). Furthermore, lack of adequate rest was explicitly linked to poor quality of life (Szwamel et al., 2022). Thus, workload is not merely about hours but encompasses the cognitive, emotional, and physical intensity, role conflicts, and recovery opportunities.

Table 5. Quantified Relationships Between Specific Job Demands and HCP Well-being Outcomes

Demand Category	Specific Indicator	Key Outcome Measured	Reported Effect Size / Association / Prevalence	Key Supporting Studies (Author, Year)
Volume & Duration	Work Hours (≥100/wk vs <40)	Suicidal Ideation	Increased Risk (OR=3.64, p<0.01)	Ishikawa, 2022
	Work Hours (General)	Burnout	Significant Predictor (β=0.044, p=0.031); Avg	EL Dabbah & Elhadi, 2023; Wontorczyk et al., 2023

			>55 hrs/wk linked to stress.	
	Increased Workload (Pandemic)	Burnout	Increased Risk (OR=1.4)	Izdebski et al., 2022
	Heavy Workload (Subjective)	Emotional Exhaustion	71.6% Prevalence among Polish HCPs.	Szwamel et al., 2022
Intensity	Mental Demands / Work Effort	Emotional Exhaustion	Strong Positive Correlation (r=0.74 / r=0.68, p≤0.01).	Belji Kangarlou et al., 2022
	Physical Demands	Diaphragm Tension (Physiological Stress)	Positive Correlation (r=0.35, p<0.05).	Masłoń et al., 2024
	General Job Stress	Hair Cortisol; Emotional Exhaustion	Positive Correlation (r=0.142; r=0.143, p<0.05).	Ibar et al., 2022
Emotional Burden	Surface Acting	Job Stress	Significant Contribution (β=0.304, p<0.01).	Kumar & Jin, 2021
	Exposure to Death/Trauma	Stress, Grief, Burnout	Primary Cause (Qualitative); Work Trauma (33% Polish HCPs) → ↑ Burnout Risk (~2x).	Fathuse et al., 2023; Izdebski et al., 2022
Role & Conflict	High Responsibility (Safety)	Stress	Primary Stressor (72% Polish COVID Nurses).	Tomaszewska et al., 2021

Work-Family Conflict	Burnout	Primary Contributor.	Wu et al., 2021
Role Overload/Additional Burden	Stress; Emotional Exhaustion	Combination → High Stress (Consistency 0.88-0.90); Additional Burden → ↑ Emotional Exhaustion (β=0.136).	Quan et al., 2022; Kishi et al., 2022
High Job Demands (General)	Stress; Psychophysical Fatigue	Primary Stress Cause (Mean Karasek=22.00); Stress Predictor (β=0.48).	Briciu et al., 2023; Wontorczyk et al., 2023

Based on this overwhelming and consistent evidence, addressing workload and job demands must be central to any meaningful strategy for mitigating stress and burnout. The findings strongly imply that interventions must move beyond individual coping mechanisms to tackle structural issues. This necessitates policy-level action on safe staffing ratios and working hours, organizational commitment to optimizing workflows and reducing administrative burdens, and team-level strategies for managing emotional and cognitive load. Ignoring the fundamental impact of job demands will render other well-being initiatives superficial and ultimately ineffective.

2. Organizational Factors, Work Environment, and Resources

Table 6. Organizational Resources and Deficits: Protective vs. Risk Mechanisms

Organizational Factor / Resource	Protective Function	Risk Function	Key Supporting Studies
Social Support (Supervisor/Colleague)	Mediates stressors; Buffers fatigue (Interax β=0.39); Coaching leadership moderates stress.	Lack → ↑ Burnout (β=1.457), ↑ Depression Risk, ↑ Burnout Risk (HR=1.462); 'Minimal Support'.	Wu et al., 2021; Tucak Junaković & Macuka, 2021; Kumar & Jin, 2021; Bellanti et al., 2022; Li et al., 2022; Sun et al., 2022; Szwamel et al., 2022

Job Control / Autonomy	Enables coping & resource management.	Low Control → ↑ Disengagement (β=-0.45); Lowest control in residents (Mean=54.53).	Tucak Junaković & Macuka, 2021; Briciu et al., 2023
Reward / Recognition (ERI)	High Reward → ↓ Burnout (β=-1.277); Higher Income → ↓ SI Risk (OR <1).	ERI (High Effort/Low Reward) → Stress/Burnout Cause (β effort=1.101); Low Pay/Income → ↑ Burnout.	Yuan et al., 2021; Ishikawa, 2022; Hacımusalar et al., 2023; Szwamel et al., 2022
Leadership & Communication	*Coaching leadership moderates stress; Effective communication builds trust.*	Poor Communication → ↑ Burnout Risk (OR=2.913).	Kumar & Jin, 2021; Yamada et al., 2023
Staffing Levels	Adequate staff → manageable workload.	Understaffing → Exacerbates Burnout & Workload (>90% COVID nurses affected).	Kishi et al., 2022; Tomaszewska et al., 2021; Fathuse et al., 2023
Institutional Psychological Support	Formal programs aid coping.	Lack of Support → Burnout Risk Factor (HR=1.462), ↑ Depression Risk; 'Minimal Support'.	Sun et al., 2022; Li et al., 2022; Szwamel et al., 2022
Work Environment Climate/Safety	Positive safety culture, respectful environment.	High-Risk Environment; Long Commute (>59km) → ↑ Burnout Risk (OR 0.19-0.20); Rationing of Care → ↑ ICU Burnout (r=0.115-0.204).	Tomaszewska et al., 2021; Ślusarz et al., 2021; Tomaszewska et al., 2022

As summarized in Table 6, the organizational context and availability of resources emerge as critical moderators buffering or exacerbating the impact of job demands, a finding strongly supported by 22 included studies and consistent with the JD-R model's emphasis on job resources (Bakker & Demerouti., 2017). Resource deficits consistently function as significant risk factors. Insufficient staffing (understaffing) was

a pervasive problem highlighted across multiple contexts (Poland, Italy, South Africa, Japan), directly increasing workload and burnout risk (Tomaszewska et al., 2021; Bellanti et al., 2022; Fathuse et al., 2023; Kishi et al., 2022). This underscores inadequate staffing as a major systemic failure contributing to HCP distress.

Social resources, particularly support from supervisors and colleagues, proved to be a potent protective factor. Wu et al. (2021) demonstrated its significant mediating role in Taiwan, while Tucak Junaković & Macuka (2021) found high social support buffered the negative effects of demands on fatigue in Croatia (interaction $\beta=0.39$, $p<0.01$). Conversely, lack of support from superiors and family was a strong predictor of burnout ($\beta=1.457$, $p<0.001$) in Italy (Bellanti et al., 2022). Low organizational support was also linked to depressive symptoms in China (Li et al., 2022), increased burnout risk (HR=1.462) in Romania (Sun et al., 2022), and cited as 'minimal support' contributing to stress in Poland (Szwamel et al., 2022). Insufficient instrumental support further worsened stress outcomes (Kumar & Jin, 2021).

Job control (autonomy) and reward systems are other vital organizational resources. Low job control significantly predicted disengagement ($\beta=-0.45$, $p<0.01$) (Tucak Junaković & Macuka, 2021) and contributed to high-strain conditions (Briciu et al., 2023). The Effort-Reward Imbalance (ERI) model was empirically validated: high effort coupled with low reward (financial, recognition, career opportunities) was a primary stress cause and significantly triggered burnout (β coefficients 1.101 for effort, -1.277 for reward) (Yuan et al., 2021). Low income independently increased suicidal ideation risk in Japan (OR <1, $p<0.05$) (Ishikawa, 2022) and burnout in Turkey (Hacımusalar et al., 2023) and Poland (Szwamel et al., 2022). Even logistical factors like long commute distances (>59km) increased burnout risk (OR 0.19–0.20, $p<0.01$) (Ślusarz et al., 2021), reflecting resource drain.

The broader organizational climate, shaped by leadership and communication, is crucial. Supportive coaching leadership can buffer stress (Kumar & Jin, 2021), whereas poor communication from leadership significantly predicts burnout (OR=2.913, $p<0.05$) (Yamada et al., 2023). Access to formal institutional psychological support, though sometimes underutilized, remains an important resource; its perceived absence increases risk (Sun et al., 2022; Li et al., 2022; Szwamel et al., 2022). Systemic issues like enforced care rationing due to resource limits also contribute to burnout (Tomaszewska et al., 2022). These findings collectively emphasize that organizations are not passive settings but active determinants of HCP well-being through the resources they provide or withhold. Consequently, sustainable solutions require systemic organizational interventions focused on resource enhancement, supportive leadership, fair practices, and a positive work climate.

3. Individual Factors, Coping, and Personal Characteristics

Table 7. Individual Risk vs. Protective Profiles in Facing Occupational Stress

Individual Factor Category	Risk Profile Indicators	Protective Profile Indicators	Key Supporting Studies
Demographics	Age/Experience: Younger (<5yrs, 53.4% vulnerable) OR Older (>54yrs, OR 4.8) - Context Matters.	(No clear, consistent protective demographic profile identified)	Wu et al., 2021; Ślusarz et al., 2021; EL Dabbah & Elhadi, 2023
Health Status	Poor Physical Health (HR 1.8-2.9); Chronic Illness (23.5% in depressed nurses); Poor Sleep (Mediator, $p<0.001$); ↑ Hair Cortisol ($r=0.14$).	Good Physical & Mental Health; Sufficient, Quality Sleep.	Sun et al., 2022; Li et al., 2022; Hacımusalar et al., 2023; Živanović et al., 2022; Ibar et al., 2022; Szwamel et al., 2022
Psychological Traits	Personality (Introversion, Neuroticism); Low Psychological Flexibility (+ High Demands → High Stress, Consistency 0.88-0.90).	Emotional Stability; High Psychological Flexibility; Active Coping (Regular Leave: $\beta=-0.27$; Stable Relationships: $\beta=-0.11$ → ↓ Stress).	Quan et al., 2022; Wontorczyk et al., 2023
Interpersonal Experience	Victim of Workplace Violence / Mobbing (→ ↑ Burnout & ↓ Sleep Quality, $p<0.001$).	Safe & Respectful Work Environment.	Hacımusalar et al., 2023
Quality of Life	Poor Quality of Life (due to lack of rest/support)	High Quality of Life.	Szwamel et al., 2022

While external factors provide the primary stressors and resources, individual characteristics significantly modulate vulnerability and response, as highlighted by 21 relevant studies and summarized in Table 7. Demographic factors like age and experience showed complex patterns: some studies found younger/less experienced

HCPs more vulnerable (Wu et al., 2021; Ślusarz et al., 2021), while others found higher risk in older groups (Ślusarz et al., 2021; EL Dabbah & Elhadi, 2023), suggesting context and career stage interactions. This complexity implies that support strategies may need tailoring across the career lifespan.

Individual health status emerged as a potent moderator. Poor physical health dramatically increased burnout risk (HR up to 2.9) (Sun et al., 2022). Critically, poor sleep quality was consistently identified as a major risk factor, acting as a mediator between distress and burnout (Živanović et al., 2022), and correlating with all burnout dimensions ($p<0.001$) (Hacımusalar et al., 2023). This psychosomatic link was reinforced by the correlation between perceived stress and hair cortisol ($r=0.142$) (Ibar et al., 2022). Chronic illness also increased depression likelihood (Li et al., 2022). Furthermore, pre-existing or co-occurring mental health issues (anxiety 62.6%, depression 38.8% in one Polish sample) were strong predictors of stress (Szwamel et al., 2022).

Dispositional psychological factors significantly influence stress responses. Quan et al.'s (2022) fs-QCA demonstrated that configurations including introversion, neuroticism, and low psychological flexibility, when combined with high demands, strongly predicted high stress (consistency 0.88-0.90). Conversely, personal resources and adaptive coping serve as crucial buffers. Regularly taking leave ($\beta=-0.27$) and having stable personal relationships ($\beta=-0.11$) significantly reduced stress among psychiatrists (Wontorczyk et al., 2023). Poor overall quality of life, linked to insufficient rest and social support, also predicted stress (Szwamel et al., 2022). Psychophysical fatigue itself was a major stress predictor ($\beta=0.48$) (Wontorczyk et al., 2023).

Negative interpersonal experiences, specifically workplace violence or mobbing, have devastating consequences. Hacımusalar et al. (2023) found highly significant associations between experiencing such abuse and increased burnout scores, alongside poor sleep quality ($p<0.001$). This underscores that individual well-being cannot be divorced from the psychosocial safety of the work environment. Organizations must actively foster a culture of respect and implement robust anti-bullying/violence policies. Recognizing these individual factors is vital not for blaming individuals, but for tailoring support, strengthening personal resources (coping skills, resilience, health behaviors), and advocating for safe, supportive work environments accommodating diverse individual needs.

4. Pandemic Context and Crisis-Specific Stressors

Table 8. Pandemic-Specific Stressors and Their Impact on HCP Well-being

Pandemic Stressor Category	Specific Manifestation & Impact Examples	Key Supporting Studies

Infection Risk & Safety Concerns	Fear of Infection (Self/Family); PPE Concerns/Lack.	Strong Correlation with Burnout (r=0.63-0.71); Primary Stressor; Part of 'Minimal Support'.
Acute Clinical & Emotional Load	High Exposure to Death/Grief; Work-Related Trauma.	Primary Cause of Existential Stress & Burnout (Qualitative); Trauma (33% Polish HCPs) → ↑ Burnout Risk (~2x).
Systemic & Resource Disruption	Staff Shortages (Illness/Quarantine); Uncertainty (Virus/Protocols); Abrupt Role Changes/Isolation/Quarantine; Poor Communication.	>90% Nurses Affected; Exacerbated Load & Anxiety; Quarantine → ↑ Burnout Risk (OR 3.352); Poor Communication → ↑ Burnout Risk (OR 2.913).
Ethical & Moral Conflicts	Ethical Dilemmas / Rationing of Care.	Positive Correlation (weak, r=0.115-0.204) with ICU Burnout (p<0.05).
General Psychological Impact	Psychological Distress (Depression, Anxiety, Stress).	High Prevalence (e.g., 62.6% Anxiety Poland); Primary Burnout Cause (r>0.68 Serbia Pharmacists).

The COVID-19 pandemic, the dominant context for 17 of the reviewed studies (summarized in Table 8), acted as a potent stress amplifier and introduced unique crisis-specific stressors. Fear of infection (self and family) was a pervasive source of anxiety and a significant predictor of burnout, with strong correlations reported in Iran (r=0.63-0.71) (Belji Kangarlou et al., 2022) and cited as a major stressor in Japan (Kishi et al., 2022) and Poland (Izdebski et al., 2022; Szwamel et al., 2022). Direct, prolonged exposure to unprecedented patient mortality and suffering inflicted a heavy emotional and traumatic toll, identified as a primary cause of existential distress and burnout, particularly for frontline workers (Fathuse et al., 2023; Izdebski et al., 2022).

Widespread uncertainty regarding the virus, treatment protocols, resource availability (including PPE, cited as lacking by Szwamel et al., 2022), and patient status created chronic anxiety (Kishi et al., 2022; Fathuse et al., 2023). Logistical disruptions, especially staff shortages due to illness/quarantine (Tomaszewska et al., 2021), dramatically increased workload and risk. Abrupt changes in work roles or mandatory

quarantine were significant burnout predictors (OR 3.352) (Yamada et al., 2023). These operational pressures compounded the psychological burden.

The pandemic also presented acute ethical dilemmas. Resource scarcity forced care rationing, which correlated positively, albeit weakly, with all burnout dimensions among ICU nurses ($r=0.115$-0.204, $p<0.05$), highlighting the impact of moral distress (Tomaszewska et al., 2022). These factors cumulatively contributed to exceedingly high rates of general psychological distress (depression, anxiety, stress) reported globally during this period (Živanović et al., 2022; Briciu et al., 2023; Sun et al., 2022; Li et al., 2022; Szwamel et al. [62.6% anxiety, 38.8% depression], 2022). Distress itself became a primary driver of burnout ($r>0.68$) (Živanović et al., 2022).

The pandemic experience underscores how external crises profoundly reshape the occupational stress landscape, testing individual and systemic resilience. Studies comparing pre-pandemic and during-pandemic conditions explicitly showed deterioration (e.g., Yamada et al., 2023). Effective crisis response must therefore integrate robust mental health support, clear communication, resource assurance, and acknowledgment of the unique burdens faced by HCPs into preparedness plans. Integrating these lessons is vital for future health system resilience.

CONCLUSION

This scoping review synthesized evidence from 25 primary studies (2021-2025) to map the multifactorial determinants of occupational stress and burnout among physicians and nurses. The findings conclusively demonstrate that these phenomena arise from a complex interplay between high job demands (both quantitative and qualitative), inadequate organizational resources and support systems, individual vulnerability and coping factors, and exacerbating crisis contexts such as the COVID-19 pandemic. Workload and lack of organizational resources, particularly social support and fair rewards, consistently emerged as dominant risk factors across diverse settings. The logical consequence of these findings underscores the inadequacy of solely focusing on individual resilience. Effectively addressing the critical issue of HCP stress and burnout necessitates multi-level, systemic interventions. Strategies must prioritize organizational changes aimed at managing workloads, ensuring adequate staffing, fostering supportive leadership and collegial relationships, implementing fair reward systems, and enhancing job control. Concurrently, providing accessible mental health resources and supporting the development of adaptive coping skills at the individual level remains crucial. Addressing these interconnected factors is fundamental not only for enhancing the well-being of the healthcare workforce but also for ensuring the quality, safety, and sustainability of healthcare systems globally. Further research focusing on longitudinal designs and the evaluation of multi-level interventions is warranted.

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