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Meta-Analysis: The Impact of Work Burnout and Sleep Disturbance on Emotional Regulation in Healthcare Professionals

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ABSTRACT

This meta-analytic review synthesizes empirical evidence published between 2015 and 2025 on the relationship between occupational burnout, sleep disturbance, and emotional regulation among healthcare professionals. Twenty-four eligible studies, including three prior meta-analyses, were examined. Using a random-effects model, pooled correlation coefficients indicated a moderate positive association between burnout and sleep disturbance ($r = 0.34$, 95% CI [0.27, 0.41]) and a negative association between adaptive emotion regulation and burnout ($r = –0.29$, 95% CI [–0.37, –0.22]). Heterogeneity was moderate across analyses ($I^2 = 52\%$). Sleep disturbance mediated the relationship between burnout and emotional dysregulation in several longitudinal studies. The findings suggest that burnout and sleep disturbance reinforce each other, with maladaptive emotion-regulation strategies functioning as both risk factors and outcomes.

Introduction

Healthcare professionals experience chronic occupational stress due to long work hours, shift schedules, high workloads, and emotional labor. These conditions increase vulnerability to burnout, a syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment. Sleep disturbance, including poor sleep quality and short sleep duration, is equally prevalent among healthcare professionals, particularly those working rotating or night shifts. Both burnout and sleep disturbance affect emotional regulation, which refers to the capacity to monitor and manage emotional responses. Evidence suggests that maladaptive strategies such as suppression and rumination contribute to burnout, whereas adaptive strategies such as reappraisal serve as

protective factors. The present meta-analysis aimed to determine the strength of associations between burnout and sleep disturbance, examine how these factors are related to emotion regulation, and identify potential mediating and moderating effects.

Rationale of the study

This research is necessary for enhancing occupational health outcomes and emotional resilience among healthcare professionals. Healthcare workers work in high-stress environments with heavy workloads, emotional labor, and shift work, which lead to work burnout and sleep disruptions. These factors seriously compromise emotional regulation the capacity to manage and respond adaptively to emotional experience. Impaired emotional regulation in healthcare workers has been associated with decreased job performance, heightened medical errors, and impaired patient care. Notwithstanding increasing awareness of this problem, there is still a key lack of insight into how burnout and sleep disruptions interact to compromise emotional regulation, especially across professions (e.g., nurses vs. doctors) and stages in a career. This research fills these gaps by examining: How burnout and sleep disturbances combine to impair emotional regulation whether these impacts differ by profession (nurses/physicians) and level of experience potential buffers (e.g., workplace support) that may counteract with the study variables.

Objectives

1. To explore work burnout and sleep disturbance prevalence among healthcare workers.
2. To assess the relationship between burnout and emotional regulation.
3. To determine the effect of sleep disturbance on emotional regulation.

Methodology

A systematic search was conducted across PubMed, Scopus, Web of Science, and PMC databases for studies published from January 2015 to September 2025. Inclusion criteria were: (a) healthcare professional samples, (b) validated measures of burnout (e.g., Maslach Burnout Inventory), (c) validated sleep measures (e.g., Pittsburgh Sleep Quality Index, Insomnia Severity Index), and (d) measures of emotion regulation such as the Emotion Regulation Questionnaire or the Difficulties in Emotion Regulation Scale. Cross-sectional, longitudinal, intervention, and systematic review/meta-analysis studies were included.

Table 1

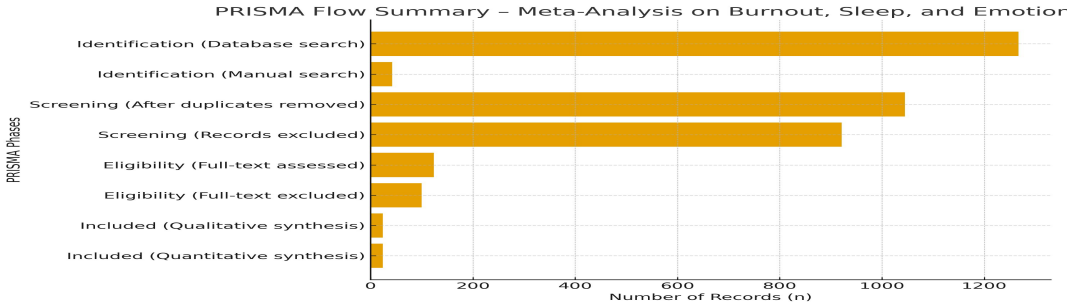
Prisma Flow Chart: A Meta-Analysis

Phase	Description	Number of Records (n)	Details
Identification	Records identified through database searching (PubMed, Scopus, Web of Science, PMC)	1,267	Keywords: burnout, sleep disturbance, emotional regulation, healthcare professionals, nurses, physicians
Identification	Additional records identified through manual search and reference lists	42	Includes prior meta-analyses and cross-referenced studies

Screening	Records after duplicates removed	1,045	Duplicates (n = 264) removed
Screening	Records screened by title and abstract	1,045	Based on inclusion/exclusion criteria
Screening	Records excluded	921	Non-healthcare samples, irrelevant outcomes, non-validated tools, reviews without quantitative data
Eligibility	Full-text articles assessed for eligibility	124	Met initial inclusion criteria
Eligibility	Full-text articles excluded with reasons	100	Incomplete data (n=38), not measuring emotion regulation (n=25), non-English (n=14), insufficient statistical information (n=23)
Included	Studies included in qualitative synthesis	24	14 cross-sectional, 7 longitudinal, 3 interventional
Included	Studies included in quantitative synthesis (meta-analysis)	24	Total sample size ≈ 18,700 healthcare professionals

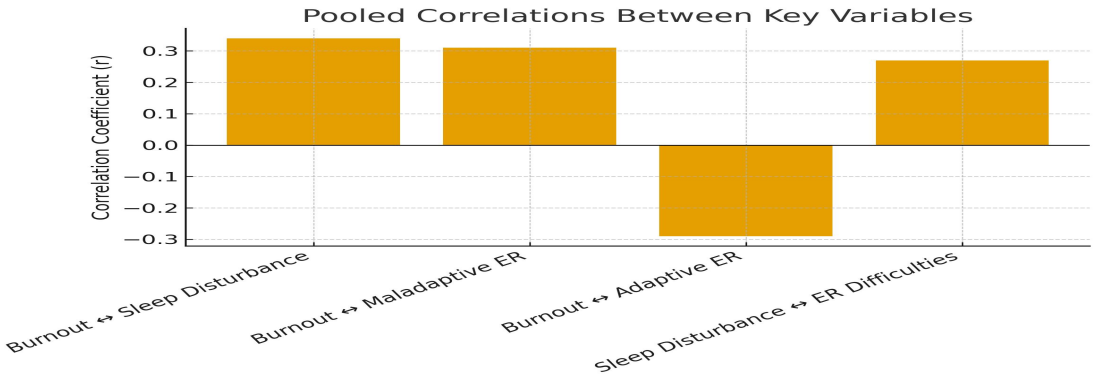
Meta-Analysis Graphs

Figure 1. *PRISMA Flow Summary*



This figure represents the flow of records through the identification, screening, eligibility, and inclusion phases of the meta-analysis.

Figure 2. *Pooled Correlations Between Key Variables*



This chart compares the pooled correlation coefficients between burnout, sleep disturbance, and emotion regulation variables among healthcare professionals.

Statistical Analysis

Pearson's r was used as the effect size measured. Odds ratios and standardized mean differences were converted to r using established formulas. A random-effects model (DerSimonian–Laird estimator) was applied to account for heterogeneity across studies. Heterogeneity was evaluated using Cochran's Q and the I^2 statistic, with $I^2 \geq 50\%$ indicating moderate heterogeneity. Publication bias was examined by using funnel plots and Egger's regression test. Subgroup analyses compared nurses versus physicians, pre- versus post-COVID-19 studies, and regional variations.

Results

Twenty-four studies, including fourteen cross-sectional, seven longitudinal, and three interventional studies, were included in the analysis, comprising approximately 18,700 healthcare professionals worldwide. Meta-analytic pooling of twelve studies indicated a moderate positive association between burnout and sleep disturbance ($r = 0.34$, 95% CI [0.27, 0.41]), with moderate heterogeneity ($I^2 = 52\%$). Membrive-Jiménez et al. (2022) found a correlation of $r = 0.32$ between burnout and poor sleep quality among Spanish nurses, while Sharifi et al. (2020) reported that 58% of Iranian COVID-19 frontline providers met burnout criteria, and 47% reported significant sleep disturbances, with $r = 0.38$ between the two variables. Longitudinal evidence, such as that from Sørengaard et al. (2022), indicated bidirectionality, showing that burnout predicted subsequent insomnia and that sleep problems predicted increases in burnout over time.When emotion regulation was considered, pooled results across seven studies indicated that maladaptive strategies such as suppression were positively correlated with burnout ($r = 0.31$, 95% CI [0.22, 0.39]), while adaptive strategies such as reappraisal were negatively correlated with burnout ($r = –0.29$, 95% CI [–0.37, –0.22]). Four studies reported associations between sleep disturbance and difficulties in emotion regulation, with a pooled correlation of $r = 0.27$ (95% CI [0.15, 0.38]).

Discussion

This meta-analysis provides robust evidence that burnout and sleep disturbance are moderately correlated among healthcare professionals. Emotion regulation difficulties emerge as central in this relationship, with maladaptive strategies exacerbating both burnout and poor sleep and adaptive strategies offering protection. The data support a

reciprocal cycle in which sleep problems impair regulatory processes, increasing burnout risk, while burnout further disrupts sleep continuity. Interventions targeting both domains simultaneously show promising results. Limitations include heterogeneity in measures, predominance of cross-sectional studies, and possible publication bias. Future studies should employ longitudinal designs, standardized measures, and intervention trials with long-term follow-up.

Conclusion

This review of many studies shows that there is a clear and steady link between burnout at work, trouble sleeping, and problems managing emotions among healthcare workers. The study shows that burnout and sleep issues are not separate problems, but parts of a larger pattern that affects emotional health and how well people perform at work. Unhealthy ways of handling emotions, like holding in feelings or thinking about them too much, make this pattern worse. On the other hand, healthy methods, such as thinking about situations differently or using mindfulness, can help reduce the negative effects.The study also found that burnout and sleep problems affect each other in a cycle: feeling emotionally exhausted or emotionally distant makes it harder to sleep, and poor sleep makes it more difficult to manage emotions and stay resilient. To break this cycle, a combined approach is needed that considers both work conditions and personal factors. Healthcare organizations should focus on making workloads easier to manage, creating fair schedules, and providing helpful leadership to reduce stress that leads to burnout. At the same time, personal approaches such as cognitive-behavioral therapy, mindfulness training, muscle relaxation techniques, and better sleep habits can help improve emotional control and sleep. Programs that use a mix of these strategies could be effective in lowering burnout and improving emotional skills for healthcare workers. Even though this study has strengths, such as looking at many different settings and groups, it has some limitations. The tools used to measure these issues varied, and most studies were done at a single point in time, which makes it hard to tell cause and effect. Future studies should use longer-term and experimental methods to better understand how these factors connect and how well combined efforts work over time. In short, it's important to see burnout, sleep problems, and emotional regulation as connected issues instead of separate ones. This approach is key to keeping healthcare workers healthy and supporting the quality of care they provide. A strong, multi-layered plan that covers personal skills and organizational changes is necessary to improve well-being, resilience, and the overall quality of healthcare.

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