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REVIEW ARTICLE

Sleep quality and psychological outcomes among shift nurses working in the hospital: A systematic review

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Abstract
Poor sleep quality is a significant problem among shift nurses that leading anxiety, depression, and burnout. Understanding these associations is important since psychological distress will impact a nurse's performance, patient safety, and long-term ability. This systematic review examines the impact of sleep quality to psychological outcomes among nurses in hospital. The approach used systematic review design to reach the objective of the review. The review used a PRISMA flow diagram to transparently and systematically document the process of identifying, screening, and selecting articles. The research question is formulated based on the PICO guidelines. A systematic search of the literature between 2019–2024 was conducted across online databases such as Scopus, ScienceDirect, Web of Science, and Google Scholar. Screening for study quality was completed by using Joanna Briggs Institute (JBI) Critical Appraisal Checklist. A total of 1,245 articles were obtained through screening and a detailed review of the full text. The analysis comprised 19 studies from the various journals (n=7,391 nurses). The review highlighted that poor sleep quality ranged from a high of 94.5% to a low of 16.6%; the majority were emergency department nurses. Work-related stress, occupational patterns, and personal obligations were themes contributing to fatigue, anxiety, and depression. The results indicate a significant negative relationship between sleep quality and psychological outcomes for nurses. Interventions to enhance sleep quality and manage stress are critical for nurses. Furthermore, healthcare policymakers and hospital directors can develop more effective responses to address the psychological impact of shift work on healthcare workers. Increasing the number of incentives for nurses may help reduce the burden of working shifts.

Keywords: Clinical nurses, psychological aspect, sleep quality, systematic review, working shift

Introduction

Sleep quality is a major factor of health status among nurses especially since they work in a demanding profession (Kayaroganam et al., 2024). The American Academy of Sleep Medicine suggests that adults get 7–9 hours of sleep per day for optimal physiological and cognitive (Ramar et al., 2021). Nurses working in a shift system have an increased risk for sleep disturbances due to complexity in work schedules, night shifts, poor workload management (Alameri et al., 2024). Furthermore, sleep deprivation can affect physical health and psychological functioning as well (Shah et al., 2025). From the perspective of pathophysiology, chronic sleep loss induces increased cortisol levels, dysregulation of the hypothalamic-pituitary-adrenal (HPA) axis, and dysregulation of serotonin and dopamine, which are involved in mood and emotional control (Deng et al., 2020; Hsieh et al., 2021). Sleep disturbances are also associated with anxiety, depression, and burnout (Chen et al., 2021; Chueh et al., 2021). When left unaddressed, the condition will impact the nurses' personal well-being, decrease job performance, elevate nursing error rates, lower patient satisfaction, and increase turnover intention (Al Mawaali et al., 2024).

Poor sleep quality is reported as alarmingly prevalent among nurses worldwide (Kaur et al., 2024). For example, an investigation noted that 73.4% of Saudi nurses working in acute care experienced poor sleep quality (Alameri et al., 2024). A study in Ethiopia documented that 75.5% of nurses reported poor sleep quality due to stress and anxiety (Segon et al., 2022). In Malaysia, a study reported a relationship between chronic long working hours and anxiety, depression, fatigue, quality of care that intending to leave a nursing career (Jarrar et al., 2023). These situations raised important questions on how we can improve our understanding of sleep quality relationships with psychological factors among shift nurses.

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Additionally, sleep quality is an individual and an organizational issue in healthcare practice (Güngördü et al., 2023). Nurses working in hospitals are impacted by their work environment (Boudreau & Rhéaume, 2024). To address this, hospitals have a responsibility to provide supportive strategies including shift management, stress reduction programs, access to mental health services, and organizational wellness programs (Kim & Lee, 2022; Nashwan et al., 2021; Goudarzian et al., 2024; Sarkar et al., 2024). When nurses have limited institutional support, it creates a chronic stressor that put at risk of sleep quality (Supian & Ibrahim, 2024). This condition can even compromise the quality of nursing services delivered to patients (Mohamud et al., 2025).

Although aforementioned studies have examined aspects of sleep quality and psychological health among nurses, there remains gap in synthesizing these findings. Previous studies tended to focus on specific situations (e.g. COVID-19 pandemic), or have been limited to certain regions which resulting in a lack of thorough evidence synthesis across diverse hospital environments and international populations (Simonetti et al., 2021). As an example, Kang et al. (2020) reviewed the sleep quality measurement tools and effects from interventions in shift-work nurses. Still, they did not analyze the psychological variables associated (i.e., stress, anxiety, and burnout). Similarly, Okechukwu et al. (2023) only reported on the association of night-shift employment with depression without consideration of sleep quality as an explanatory variable or considering other psychological domains. Jeon et al. (2023) reviewed the sleep interventions (e.g., CBT, light therapy) in rotating night-shift employees. While these authors did not assess comprehensive psychological outcomes, they included mixed populations beyond nursing staff.

Moreover, the systematic review filled gaps by combining evidence from different countries that offering a deeper perspective of how sleep quality affects the nurses' mental health. In addition, the issue of sleep quality is an individual responsibility involves an important organizational role. Furthermore, the literature suggests relevant coping strategies for nurses, including regular breaks, stress management workshops, and mindfulness techniques (Sagherian et al., 2023; Alkhawaldeh et al., 2020; Wexler & Schellinger, 2023). Without these multi-level interventions, nurses face a heightened risk of burnout which may lead to reduce care quality. Thus, understanding these biological and psychological connections is essential for creating effective interventions for nurses. This will help improve workplace policies and well-being initiatives in the future. Therefore, this systematic review aims to collate and analyze current evidence on the relationship between sleep quality and psychological outcomes among hospital shift nurses. The findings propose insights to guide hospital management, policymakers, and nurse leaders in developing effective interventions to protect nurses' psychological health. To better define the focus of the review, the main research question of this study is: what is the prevalence of poor sleep quality among shift nurses? What factors are associated with it? and how does poor sleep quality affect the psychological outcomes?

Method

The systematic literature review was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Liberati et al., 2009). The current stage of identification, screening, eligibility assessment, and inclusion of relevant articles was performed following the PRISMA guidelines (Haddaway et al., 2022). The well-defined approach assures comprehensiveness of the review process that following the best practices for a systematic review and meta-analysis set forth by the PRISMA group **(Figure 1)**. The use of a systematic review is an appropriate method for answering this research question and synthesizing evidence of sleep quality and psychological outcomes among shift nurses. As compared to a narrative review or scoping review, a systematic review delivers more methodological rigor, transparency, and reproducibility. The research question for this review is formulated based on the PICO guidelines, which emphasize four key components: Population or Problem (P), Interest or Indicator (I), Comparison (C), and Outcome Measures (O) (Stern et al., 2014) The population of interest is shift nurses working in hospitals. The Interest or Indicator included the measurement of sleep quality and its relationship with psychological outcomes. This study does not involve any intervention, experimental treatment, or a specific comparison aspect. The outcome measures focus on the prevalence of poor sleep quality, associated factors (such as socio-demographic and clinical variables), and the impact of sleep quality on the psychological outcomes of shift nurses.

The systematic search for relevant literature was carefully carried out through an examination of four reputable electronic databases: Scopus, ScienceDirect, Web of Science and Google Scholar. These four databases were selected because they cover the broadest and most comprehensive range of peer-reviewed literature relevant to nursing, health sciences, and psychological outcomes. This combination made certain the comprehensive coverage, minimized publication bias, and maximized retrieval of relevant studies across global settings. A strategic search was performed using specific keywords related to sleep quality and shift nurses, including: "sleep AND quality AND nurses AND shift

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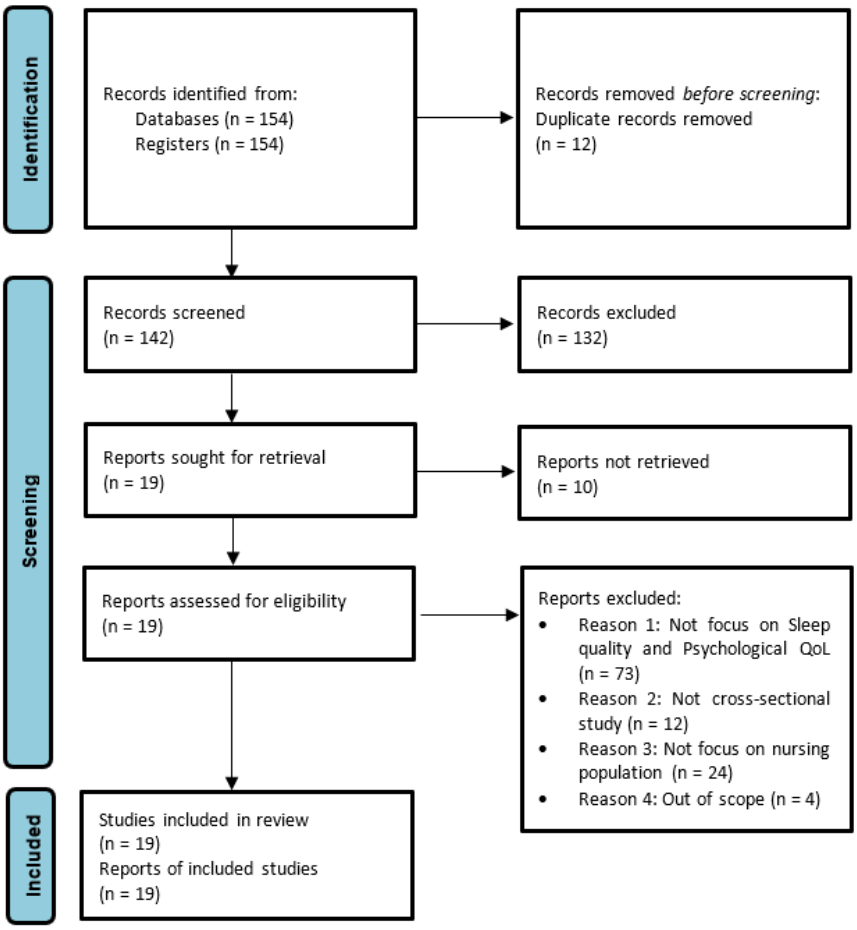


Figure 1. PRISMA 2009 Flow Diagram (Haddaway et al., 2022).

AND prevalence," "quality of life," "prevalence," "severity of sleep quality," "factors associated," and "psychological outcomes." The objective was to identify and extract highly relevant scholarly contributions **(Table 1)**.

Selection criteria for articles included in this study were publications in English from January 2019 to 2024, articles that discuss the prevalence of problems with sleep quality in shift nurses and socio-demographic and clinical factors associated. Moreover, studies must be on shift nurses employed in hospitals and must be of cross-sectional quantitative design. The rest of the criteria were defined to look into the relationship between sleep quality and psychological outcomes among shift nurses. The included studies primarily used the Pittsburgh Sleep Quality Index (PSQI). This tool has been widely used to assessing sleep quality in healthcare populations due to its reliability and standardization across diverse settings (Buysse et al., 1989; Zhang et al., 2020). Other tools such as the Insomnia Severity Index (ISI) were used in a smaller subset of studies where appropriate **(Table 2)**.

Exclusion criteria were employed to ensure and uphold methodological rigor and the relevance of the selected studies to the research purpose. Any study that did not specifically target shift-working nurses or that contained mixed healthcare populations that did not allow the researcher to extract nurse-specific results would warrant exclusion. Any article not conducted in a hospital-based setting, such as community nurses, outpatient clinics, or home care, would be excluded. In addition, studies that used qualitative designs, systematic reviews or scoping reviews, editorials, or conference abstracts, and those that were only concerned with intervention effects without specificity to reporting sleep quality or psychological outcomes were also excluded. Studies that were published only in non-English languages and those full-text articles that were not retrievable were all sources that would be excluded.

Although systematic reviews are often applied to intervention studies, they can also synthesize observational studies, especially when the aim is to assess associations or prevalence rather than causal effects (Liberati et al., 2009; Haddaway et al., 2022). Therefore, the researchers included observational designs as appropriate to address this research question. All database citations were analyzed and duplications were removed. Titles, abstracts, and full texts were screened by authors. Then, the authors assessed each study by considering inclusion and exclusion criteria. Consensus was achieved through discussion which served to resolve all disagreements between the authors. Articles that met the inclusion criteria were presented. Findings from data extraction were reviewed and assessed by using Joanna-Briggs Institute (JBI) critical appraisal tools **(Table 3)**. The tools from JBI were selected and utilized based on the methodology of each included paper. This assessment was performed to measure the quality of methodology in each study and determine whether possible biases were handled in terms of design, execution, and analysis (Moola et al., 2015). The authors conducted a thorough reading of the full texts of all studies included. Agreement on interpretations and conclusions was reached through collaborative discussion **(Tables 4 & 5)**. The research team then synthesized the findings, identifying key themes and patterns across the studies. Through this process, they were able to draw conclusions and implications for practice. The collaborative approach made the analysis became more comprehensive and grounded in the evidence.

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Table 1. Literature search.

Databases	Keywords	Results
Scopus	TITLE-ABS-KEY ("sleep AND quality AND nurses AND shift AND prevalence") OR TITLE-ABS-KEY ("quality AND of AND life") AND TITLE-ABS-KEY ("Prevalence" OR "Severity of sleep quality" AND "shift nurses") AND TITLE-ABS-KEY ("Factors associated" AND "shift nurses" AND "Psychological Quality of Life")	30
Web of Science	KEY ("sleep quality" AND "shift nurses") AND KEY ("Prevalence sleep quality" OR "Risk Factor sleep disturbances" OR "Quality of Life") AND KEY ("Prevalence sleep issues" OR "shift nurses") AND KEY ("Quality of Life sleep disturbances" OR "factors associated with sleep quality")	40
Science Direct	KEY ("sleep quality" AND "shift nurses") AND KEY ("Prevalence sleep disturbances" OR "Risk Factor sleep quality" OR "Quality of Life") AND KEY ("Prevalence sleep disorders" OR "shift nurses") AND KEY ("Quality of Life sleep" OR "factors associated with sleep quality")	32
Google Scholar	("Prevalence Sleep Disorders" OR "Pittsburgh Sleep Quality Index PSQI" OR "Shift Nurses Sleep Quality") AND ("Factors Associated with Shift Nurses Sleep Quality" AND "Psychosocial Quality of Life Shift Nurses") AND ("Quality of Life Shift Nurses" AND "Psychosocial Quality of Life related to Sleep Quality in Shift Nurses")	52

Tabel 2. Numbers of excluded articles and reasons for exclusion.

Databases	Total	Articles retrieved	Articles excluded	Reason for exclusion
Scopus	30	26	23	10=not focused on two tools
				2=not cross-sectional
				9=not focused on nurses
				2=unable to access
ScienceDirect	32	32	31	22= not focused on two tools
				4= not cross-sectional
				4=not focused on nurses
				1=unable to access
Web of Science	40	36	34	4=out of scope
				3=not cross-sectional
				19=not focused on two tools
				3=unable to access
				5=not focused on nurses
Google Scholar	52	48	35	4=unable to access
				3=not cross-sectional
				22=not focused on two tools
				6=not focused on nurse

Results

The search for articles published in English from 2019 to 2024 obtained a total of 154 articles with 12 duplicates identified. The breakdown of articles obtained includes 30 from Scopus, 32 from ScienceDirect, 40 from Web of Science, and 52 from Google Scholar. After removing duplicates, 142 records remained for screening. Two reviewers (refers to authors) evaluated the titles and abstracts of these articles, resulting in the exclusion of 123 articles that did not meet the inclusion criteria. The reasons for exclusion included: 23 articles from Scopus (10 not focused on two tools, 2 not cross-sectional, 9 not focused on nurses, and 2 inaccessible), 31 from ScienceDirect (22 not focused on two tools, 4 not cross-sectional, 4 not focused on nurses, and 1 inaccessible), 34 from Web of Science (4 out of scope, 3 not cross-sectional, 19 not focused on two tools, 3 inaccessible, and 5 not focused on nurses), and 35 from Google Scholar (4 inaccessible, 13 not cross-sectional, 22 not focused on two tools, and 6 not focused on nurses). Subsequently, the full texts of the remaining 19 articles were further assessed for eligibility. All 19 articles met the inclusion criteria and were included in the review

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process. A second set of reviewers conducted quality assessments on the selected articles. The PRISMA 2009 Flow Chart was utilized to summarize the article selection process for the study **(Figure 1)**.

The summary analysis of the 19 studies has an overall indication of poor quality of sleep among shift nurses, which was from 16.6% to 94.5%. The study reported that 94.5% of emergency department nurses in Jordan had poor sleep quality (Malak et al., 2023). Conversely, a study reported only 16.6% of these emergency nurses experienced mild sleep disturbances (Al Mawaali et al., 2024). The finding suggested that some nurses were able to sustain more favorable sleep quality within less-than-ideal work conditions. Additionally, the studies covered multiple countries such as Saudi Arabia, Turkey, China, Japan, Ethiopia and so forth which included 7,391 nurses. Researchers also identified factors associated with poor sleep quality. A study identified relationships between sleep disturbances and high levels of perceived fatigue (Al Mawaali et al., 2024). Meanwhile, other study documented that married female nurses experienced greater difficulty obtaining quality sleep due to work and family responsibilities (Hwang & Yu, 2021).

The studies showed an association between poor sleep quality and the negative psychological outcomes such as anxiety, depression, burnout, emotional exhaustion, and poorer coping. For example, A study revealed that 28.7% of emergency nurses reported anxiety symptoms and 13.6% of the emergency nurses reported depression symptoms, both of which were closely linked to sleep disturbance (Al Mawaali et al., 2024). Similar results were found in China, with one study reporting that 30.4% of nurses had anxiety symptoms (Wang et al., 2020). Another study found high anxiety and depression scores in night shift nurses (Dai et al., 2019). Several studies reported that stress and burnout were significant mediators between poor sleep and psychological health. For instance, burnout mediated the relationship between workplace stress, sleep quality, and depressive symptoms (Hsieh et al., 2021). Emotional exhaustion and empathy fatigue were associated with poor sleep quality among nurses in high-pressure workplaces such as an emergency department or COVID-19 unit (Molu et al., 2023; Nashwan et al., 2021). Other studies have reported work-family conflict (Hwang & Yu, 2021), financial stress (Kılıncarslan et al., 2024), and self-blame (Yin et al., 2022), all of which contribute to the psychological harm caused by poor sleep. Overall, the literature suggests that shift nurses experiencing sleep disturbances are at risk of physical, psychological, and emotional consequences. These consequences may compromise their performance in clinical practice.

In addition, to summarize the findings, there are also several studies that reinforce these trends: in an acute-care context, 73.4% of nurses experienced poor sleep and 90.2% reported severe fatigue, with sleeping disturbance being the strongest correlation with total fatigue (Alameri et al., 2024); in infectious-disease hospitals, mean PSQI scores were 7.07, anxiety prevalence was 41.18%, and depression was 42.31%, both were strongly correlated to poor sleep quality (Xi et al., 2022); during the COVID-19 period nurses who worked in designated facilities for patients with COVID-19 reported higher emotional exhaustion than nurses who were not in designated COVID-19 facilities (Nashwan et al., 2021); Japanese study showed higher levels of fatigue were associated with higher levels of stress and less satisfaction with sleep (Hosona & Uesugi, 2023); in psychiatric nurses, sleep quality, stress, and burnout explained 46% of variance in depression symptoms (Hsieh et al., 2021); chronotype analysis indicated evening-type nurses had greater PSQI scores and severe fatigue was associated with medical errors (Karahan et al., 2020); in tertiary hospital, China study, 30% of nurses reported anxiety symptoms and very poor sleep (Wang et al., 2020); and all specialized hospitals in Ethiopia had, 75.5% prevalence of poor sleep quality and concurrent stress and anxiety (Segon et al., 2022).

Discussion

This systematic review obtained 19 relevant studies with a total sample size of 7,391 nurses across different hospital worldwide. The PSQI was been the most used tool to assess sleep quality among involved studies. Sleep deprivation and disturbance were caused by job-related stress and irregular shift hours. Nurses experienced a complexity to maintain healthy sleep due to job demands. One major finding is from Malak et al. (2023), where 94.5% of emergency nurses have poor sleep quality due to stress and irregular working hours. However, Al Mawaali et al. (2024) presented that 16.6% of emergency nurses reported mild sleep disturbances. This disparity suggests that despite the majority of nurses experiencing sleep quality issues, some employ effective coping strategies that promote better sleep. Research has demonstrated the challenges facing shift nurses when it comes to quality of sleep. For instance, Alameri et al. (2024) identified that 73.4% of Saudi nurses had poor sleep quality that associated with higher fatigue. This finding underlined the association of sleep disturbance on fatigue among nurses. Similarly, Kılıncarslan et al. (2024) found that in Turkey, one in three nurses reported poor sleep quality and nearly half experienced daytime drowsiness. Both conditions were associated with heightened stress coping mechanisms and depression. These results are consistent with meta-analytic evidence showing an association between burnout and sleep difficulties, pooled estimates suggesting that night-shift work is more associated with depressive symptoms, and cross-sectional data showing a very high prevalence of poor

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sleep (often >60%) among nurses working multiple consecutive night shifts (Huang et al., 2021; Membrive-Jiménez et al., 2022).

Table 3. Quality Appraisal.

Author (year), Country	Inclusion criteria	Subject and setting	Validity and reliability	Risk of bias	Identify confounding factors	Strategies to deal with confounder	Outcome measure	Statistical analysis
Alameri et al. (2024), Saudi Arabia	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Al Mawaali et al, (2024), Oman	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Bilgiç et al. (2021), China	Yes	Yes	Yes	No	Yes	No	Yes	Yes
B. Wang et al. (2021), China	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dai et al. (2019), China	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Deng et al. (2020), China	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
D. Wang et al. (2020), China	Yes	Yes	Yes	No	Yes	No	Yes	Yes
Güneysu et al. (2024), Turkey	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Hwang & Yu, (2021), South Korea	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hsieh et al. (2021), Taiwan	Yes	Yes	Yes	No	No	No	Yes	Yes
Hosona & Uesugi, (2023) Japan	Yes	Yes	Yes	No	Yes	No	Yes	Yes
Karahan et al. (2020), China	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Malak et al. (2023),Saudi Arabia	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Molu et al. (2023), Turkey	Yes	Yes	Yes	No	No	No	Yes	Yes
Nashwan et al. (2021), Qatar	Yes	Yes	Yes	No	Yes	No	Yes	Yes
Segon et al. (2022), Ethiopia	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Kılıncarslan et al. (2024), Turkey	Yes	Yes	Yes	No	No	No	Yes	Yes
Xi et al. (2022), China	Yes	Yes	Yes	No	Yes	No	Yes	Yes
Yin et al. (2022), China	Yes	Yes	Yes	No	No	No	Yes	Yes

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The study revealed a significant association between sleep quality, Generalized Anxiety Disorder (GAD-7) scores, and Patient Health Questionnaire (PHQ-9) scores among both shift and non-shift nurses, suggesting that poor sleep quality is exacerbated by psychological stress (Güneysu et al., 2024). A study in Ethiopia discovered that 75.5% of nurses experienced poor sleep quality which contributed to stress and anxiety in hospitals (Segon et al., 2022). Molu et al. (2023) investigated the relationship between chronotype and social jet lag in shift nurses, with a particular emphasis on those working in high-pressure departments such as emergency and intensive care. These findings are consistent with Dai et al.'s 2019 study, which revealed that night shift nurses experience significantly poorer sleep quality. Additionally, Karahan et al.'s 2020 research showed that evening-type nurses tend to have higher PSQI scores compared to morning-type nurses that highlighting the impact of chronotype on sleep quality. Hwang and Yu (2021) found that married nurses experience shorter sleep duration and longer sleep latency due to work-family conflict. Similarly, Wang et al. (2021) discovered that psychiatric nurses working frequent shifts have varying sleep quality. Both studies emphasize that personal life and psychological stress significantly affect sleep quality among nurses.

Research consistently shows that shift nurses experience significant sleep quality issues, particularly those working in high-pressure units like emergency and intensive care departments (Malak et al., 2023). A study by Xi et al. (2022) found that nurses in infectious disease hospitals had an average PSQI score of 7.07, reinforcing the widespread nature of sleep disturbances among nurses. Chronic sleep problems not only affect nurses' well-being but also impact job performance that leading to increased fatigue and decreased effectiveness at work. These findings are consistent with external cohorts measuring the relationship between sleep and psychological symptoms. In a cross-sectional study with 1219 nurses, worse PSQI scores were still significantly related to higher GAD-7 and PHQ-9 symptomatology, while social support moderated—but did not negate—these relationships (Zhao et al., 2024). In addition, an extensive cross-sectional study found the prevalence of poor sleep was consistently over 60%. This was true for nurses working two consecutive night shifts, and even when comparing non-night shift nurses, excess rates, indicating both impairment and circadian misalignment, are maintained, in part, by ceasing night work (Huang et al., 2021).

Nurses make up a significant portion of the healthcare workforce and their psychological well-being is crucial, particularly in high-pressure hospital settings. Research confirms a direct link between poor sleep quality and increased symptoms of anxiety and depression which nurses' mental health conditions. Studies have shown that nurses experiencing sleep disturbances are more likely to exhibit higher levels of anxiety and depression (Alameri et al., 2024; Güneysu et al., 2024). Research suggests that shift work can have a profound impact on nurses' psychological well-being, with financial and emotional stress being significant contributing factors (Molu et al., 2023; Kılıncarslan et al., 2024). A recent study among 173 acute care nurses in Saudi Arabia revealed that a staggering 90.2% of participants experienced moderate to severe fatigue which negatively affected their productivity, emotional and mental health (Alameri et al., 2024). The relationship between fatigue and poor sleep quality further complicates nurses' psychological well-being, as supported by Güneysu et al.'s (2024) findings. Their study revealed that nurses experiencing anxiety and depression tend to have lower mental and physical health outcomes scores. This highlights the critical need to address sleep quality and fatigue to promote better psychological well-being among nurses. Kılıncarslan et al.'s 2024 study revealed that financial stress and depression are the two primary factors contributing to poor sleep quality among nurses.

This highlights the nature of stressors affecting nurses, where financial hardship has consequences to physical and mental health. Studies by Molu et al. (2023) and Segon et al. (2022) highlight the impact of burnout and poor sleep quality on nurses' psychological well-being. Molu et al. (2023) found that female nurses experience higher levels of burnout and empathic fatigue. The study's findings are significant that revealing an association between sleep problems and mental health issues among nurses. These findings are in line with outside evidence drawn from cohorts of hospital nurses: lower PSQI scores are independently associated with higher GAD-7 and PHQ-9 symptomatology, demonstrating a strong sleep–mood coupling or relationship (Zhao et al., 2024). In addition, rosters with consecutive night shifts have a consistently high prevalence of poor sleep, with about 62% of current night-shift nurses (and 56% of former night-shift nurses) confirmed to have poor sleep, suggesting residual circadian misalignment (Huang et al., 2021). Even prospective data show consecutive night shifts result in curtailed sleep and amplified end-of-shift fatigue and thus reinforce the sleep–fatigue–psychological burden pathway (Min et al., 2024). Furthermore, the prospective data suggest that consecutive night shifts exacerbate sleep deprivation and fatigue, potentially compromising nurse well-being and patient care. The sleep–fatigue–psychological burden pathway may be a critical factor in understanding the long-term effects of night-shift work on nurses' health. Implementing strategies to optimize roster design and support nurse well-being could help lighten these negative consequences. According to Al Mawaali et al. (2024), a substantial proportion of nurses reported anxiety symptoms (28.7%) and depression (13.6%), both of which had a negative impact on quality of life and care. Studies have consistently shown that night shifts can exacerbate sleep quality and mental health issues among

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nurses. Dai et al.'s 2019 study found that night shift nurses experience poorer sleep quality and mental health compared to their day shift counterparts. Furthermore, research by Karahan et al. (2020) revealed that severe fatigue affects nearly 3 out of 5 nurses that leading to medical errors. The psychological impact of work stress on sleep quality is significant and should not be overlooked.

Table 4. Study findings.

Author, year	Study objective	Sample size	Sleep quality	Psychological outcomes
Alameri et al. (2024)	To examine sleep quality and fatigue among nurses in acute care in Saudi.	173	73.4% reported poor sleep quality, significant correlation between sleep disturbance and fatigue.	90.2% experienced severe fatigue that impacted mental and emotional well-being.
Al Mawaali et al, (2024)	To explore anxiety, depression, and sleep disturbances among emergency nurses.	331	16.6% reported mild sleep disturbances and 1.5% moderate. Anxiety and depression were linked to sleep disturbances.	28.7% reported anxiety symptoms; 13.6% experienced depression which impacted psychological health.
Bilgiç et al. (2021)	To evaluate stress and sleep quality among nurses during the COVID-19 pandemic.	316	Positive correlation between PSQI scores and perceived stress, higher stress led to poorer sleep quality.	Predictors of stress and sleep explained 33.5% of variance in stress levels.
Wang et al. (2021)	To explore sleep quality and risk factors among psychiatric nurses.	812	Significant differences in sleep quality based on shift frequency, high psychological distress linked to poor sleep quality.	High emotional exhaustion and depersonalization were associated with poor sleep that negatively impacting psychological well-being.
Dai et al. (2019)	To compare sleep quality and depressive symptoms between night and day shift nurses.	865	Night shift nurses led high PSQI scores that indicating poorer sleep.	Higher HADS scores in night shift nurses, indicating increased anxiety and depression and correlated with poorer sleep quality.
Deng et al. (2020)	To investigate the association between job stress and sleep quality among nurses in a community hospital.	180	46% of participants reported poor sleep quality, job stress negatively affected sleep quality.	Psychological effects of workplace stress impacted sleep and overall well-being.
Wang et al. (2020)	To investigate sleep quality and anxiety among nurses in tertiary hospitals in China, and analyze influencing factors	643	The average PSQI score was 7.71 ± 3.62. 72.0% scored above 5 that indicating poor sleep quality.	Anxiety Symptoms (SAS): 30.4% had an SAS score >50 that indicating varying levels of anxiety symptoms.
Güneysu et al. (2024)	To evaluate psychological effects of shift work and its impact on nurses' quality of life.	114	Poor sleep quality reported by both shift and non-shift nurses, correlation between PSQI and GAD-7, PHQ-9 scores.	Lower mental and physical quality of life linked to higher anxiety and depression levels.
Hsieh et al. (2021)	To examine mediators of sleep, burnout, and depressive symptoms in psychiatric nurses.	248	Stress, burnout, and sleep quality explained 46% of the variance in depressive symptoms.	Occupational burnout mediated the relationship between stress and depressive symptoms that affecting psychological well-being.

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Deng et al.'s 2020 study demonstrated that job stress impairs sleep quality among community hospital nurses. Research by Bilgiç et al. (2021) during the COVID-19 pandemic found a significant association between stress and sleep quality among nurses. Nurses experiencing high-stress situations tend to suffer from more severe sleep difficulties. The finding highlighted the substantial impact of psychological factors like stress and anxiety on sleep quality. Furthermore, Yin et al.'s 2022 study emphasized that negative coping mechanisms (e.g. as self-blame) can exacerbate sleep quality. In addition to our included studies, external evidence also supports the stress-sleep-safety relationship for nurses in hospitals: In cohorts of nurses working in general hospitals, greater occupational stress and greater PSQI were each independently associated with greater odds of near-miss events, emphasizing the nonsegregated nature of occupational stress and sleep disruption in routine practice (Kwak et al., 2024). Furthermore, maladaptive emotion-oriented coping, specifically self-blame, was related to greater insomnia and excessive daytime sleepiness among nurses, suggesting a reasonable psychological pathway for how stress exacerbates sleep problems (Kowalczuk et al., 2021). In further support of these findings, a national web survey of Italian nurses showed that nurses who reported poorer PSQI scores, and who had shorter rest after night shift, were each viewed as at a greater risk of medication errors, highlighting the patient safety implications of sleeping difficulties (Di Simone et al., 2020).

A study by Hsieh et al. (2021) found that burnout plays a mediating role in the relationship between high work stress, sleep problems, and depressive symptoms. Nurses experiencing significant work stress tend to develop high burnout levels, which can impair sleep quality. Similarly, Hosona & Uesugi's 2023 research revealed that higher fatigue levels are linked to increased stress and decreased sleep satisfaction. These studies suggest that nurses under high stress are more likely to struggle with getting quality sleep. A study by Nashwan et al. (2021) found that nurses experienced increased emotional exhaustion during COVID-19 pandemic. Furthermore, research by Wang et al. (2020) revealed that 30.4% of nurses in China scored high on anxiety which reflected the need to address sleep and anxiety issues in this population. A recent study by Malak et al. (2023) found that majority of nurses experience stress, with 81.1% reporting moderate stress and 14% reporting high stress. This supports the growing evidence that workplace pressure impacts nurses' sleep quality and psychological health. The findings suggest that psychological stress can lead to sleep disturbances, burnout, anxiety, and depression symptoms. Supplementary evidence outside of our included set also implicates stress–sleep pathways in nursing work. For example, among Chinese healthcare workers, structural models indicated that work stress was related to depression in part by sleep quality (and job satisfaction), highlighting the role of sleep as a mechanistic link between psychosocial strain and mood (Qin et al., 2023). Among tertiary-hospital nurses, poor sleep quality and higher perceived stress each independently predicted greater depressive symptomatology, indicating an additive effect on risk (Zhao et al., 2024). Similarly, a large cross-sectional study of 1,217 nurses reported a significant relationship between workplace stress and PSQI-defined poor sleep, suggesting the importance of occupational strain in sleep disturbance (Kayaroganam et al., 2024).

Hospitals play a crucial role in addressing shift nurses' mental health issues by implementing organization-wide initiatives. Research by Kim & Lee (2022) and Nashwan et al. (2021) highlights the importance of equitable shifts, stress reduction, and mental health resources in promoting nurse well-being. Individual-level initiatives have also been effective in promoting nurse well-being. Research by Chen et al. (2021) and Hsieh et al. (2021) highlights the benefits of implementing mental health initiatives, stress management programs, and wellness initiatives. Specifically, good sleep hygiene techniques, mindfulness, and physical activity have been linked to improved sleep quality and reduced emotional exhaustion. Kılıncarslan et al.'s 2024 study highlights the importance of promoting coping strategies for nurses, particularly female nurses manage work-life balance alongside family duties. With adopting effective coping mechanisms, nurses can reduce empathy fatigue. Meanwhile, Al Mawaali et al.'s 2024 research found that some nurses maintained good sleep quality despite experiencing stress. There is evidence beyond both of our included strategies that support both organizational and individual strategies: in a cluster randomized trial with hospital workers, decreasing “quick returns” (short interval between shifts) was associated with a measure of insomnia and daytime sleepiness, indicating that redesigning work schedules could improve sleep and day-after functioning (Djupedal et al., 2024). Similarly, in a randomized trial of digital CBT-I in nurses who had shift-work disorder, clinically meaningful reductions in insomnia were found, showing it is a scalable intervention at the individual level (Ell et al., 2024). Along with these schedule and sleep-focused strategies, a new meta-analysis of mindfulness-based interventions among nurses reported improvement in burnout, resilience, and sleep quality, which supports implementing brief psychosocial programs in combination with reforms to staffing strategies (Dou et al., 2025). Nurses' mental health is a pressing concern globally, and Malaysia is no exception. Research by Jarrar et al. (2023) highlights the impact of long working hours on anxiety, depression, and nurses' intention to leave their profession. This underscores the need for institutional changes and national guidelines to safeguard nursing's well-being.

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Table 5. Study findings.

Author, year	Study objective	Sample size	Sleep quality	Psychological outcomes
Hosona & Uesugi, (2023)	To explore the relationship between stress, fatigue, and sleep quality among nurses.	653	PSQI scores correlated with stress and fatigue.	Higher fatigue levels were linked to stress and lower sleep satisfaction.
Hwang & Yu, (2021)	To examine work-family conflict (WFC) and its predictors in married female nurses.	229	Married nurses experienced shorter sleep duration and longer sleep latency.	High levels of depression were associated with increased WFC scores.
Karahan et al. (2020)	To assess sleep quality, fatigue, and concentration among nurses based on shifts and chronotypes.	276	Evening-type nurses had higher PSQI scores compared to morning-type nurses.	Severe fatigue was reported in 58.3% of nurses who had made medical errors.
Molu et al. (2023)	To investigate the effects of chronotypes, social jetlag, and sleep quality on shift-working nurses.	134	Deterioration in sleep quality, especially in high-stress units like emergency and intensive care.	High burnout levels and empathy fatigue among female nurses negatively affected psychological state.
Malak et al. (2023)	To evaluate the influence of shift-work on perceived stress, sleep quality, and Body Mass Index (BMI) among nurses in Jordan.	450	94.5% of participants had poor sleep quality.	81.1% reported moderate stress, 14.0% reported high stress.
Nashwan et al. (2021)	To explore differences in sleep quality and mental health among nurses in COVID-19 facilities.	200	No significant association found between designated facility and ISI categories.	Nurses in COVID-19 facilities had higher emotional exhaustion that negatively impacting their psychological state.
Segon et al. (2022)	To assess the prevalence of poor sleep quality and its factors among nurses in specialized hospitals.	510	75.5% prevalence of poor sleep quality among nurses, with stress and anxiety contributing to sleep issues.	Depression, anxiety, and stress symptoms were associated with poor sleep quality.
Kılıncarslan et al. (2024)	To explore the effect of sleep quality, depression, and coping mechanisms on nurses' performance.	133	Poor sleep linked to stress coping ability and depression.	Financial situation and depression affected both sleep quality and stress coping capacity.
Xi et al. (2022)	To explore sleep quality and mental health among nurses in infectious disease hospitals.	460	Average PSQI score of 7.07 ± 2.14 that indicating poor sleep quality; 13.57% reported sleep disorders.	41.18% had anxiety; 42.31% had depression; both correlated with poorer sleep quality.
Yin et al. (2022)	To analyze the relationships between sleep quality, burnout, and coping style among psychiatric nurses.	664	High prevalence of sleep disorders and burnout; poor sleep quality was positively correlated with emotional exhaustion and cynicism.	Negative coping strategies such as self-blame worsened sleep quality, affecting psychological well-being.

Conclusion

This review highlights that shift nurses' poor sleep quality adversely affects their psychological well-being. Studies also demonstrated a correlation between sleep disorders, fatigue, anxiety, and depression. Therefore, hospital management must prioritize addressing these issues. Implementing holistic mental health support initiatives will help nurses overcome these challenges such as stress management programs and flexible working hours. Additionally, workplace wellness

programs should incorporate education on the importance of sleep hygiene and practices to improve healthy sleep. Though this review focuses on sleep quality and psychological outcomes, it underscores the urgent need for future studies on social factors among shift nurses. Investigating the impact of social support systems, interpersonal relationships, and work-life balance will provide a greater understanding of the well-being of these healthcare workers.

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AI statements
This systematic review was prepared without the use of generative artificial intelligence tools.

Author's declaration
All authors contributed to the conception and design of the review. They independently handled the data analysis, interpretation, and discussion of findings. The authors have read and approved the final version for submission.

Availability of data and materials
All data are available from the authors.

Competing interests
The authors declare no conflicts of interest in conducting and reporting the review.

Ethical clearance
Ethical clearance was not required for this systematic review, as it did not involve direct human or animal subjects. The protocol was developed a priori but was not prospectively registered in PROSPERO because data extraction had already begun. The protocol and any amendments are available from the corresponding author upon reasonable request, and reporting follows PRISMA 2020.

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Publishers and journal's note
A systematic review sits at the top of the evidence hierarchy. This review presented very well discussion of how the sleep quality relate with psychological outcomes among nurses. In addition to outlining the problems of anxiety and depression from shift work, this review presents practical solutions to mitigate their effects.

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Authors' insight

Key points

- The review found a high prevalence of poor sleep quality, sleep deprivation, and sleep disorders (such as insomnia) among shift nurses.
- A consistent and strong negative correlation exists between sleep quality and psychological well-being of shift nurses.
- The very nature of shift work disrupts the body's natural circadian rhythm leading to complexities of physical and psychological aspect.

Emerging nursing avenues

- What specific interventions are most effective in mitigating the negative psychological effects of poor sleep among shift nurses?
- How do different types of shift schedules (e.g., permanent night vs. rotating shifts) differentially impact sleep quality and psychological outcomes?
- What role do hospital-level policies and systemic support play in improving sleep quality and psychological well-being for shift nurses?

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