

COMPLEMENTARY AND HOLISTIC NURSING INTERVENTIONS TO IMPROVE SLEEP QUALITY IN INTENSIVE CARE UNIT PATIENTS: A SYSTEMATIC REVIEW

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ABSTRACT

Background: Sleep disturbances are highly prevalent among patients admitted to the Intensive Care Unit (ICU), significantly impacting their recovery and psychological well-being. Complementary and holistic nursing interventions such as aromatherapy, music therapy, guided imagery, and foot massage have been proposed as non-pharmacological strategies to improve sleep quality.

Objective: To systematically review existing literature on the effectiveness of complementary and holistic nursing therapies in improving sleep quality among adult ICU patients.

Methods: This systematic review followed the PRISMA 2020 guidelines. Literature searches were conducted in the EBSCOhost and Medline databases for studies published between 2013 and 2022 using the keywords: "complementary therapy," "holistic nursing," "ICU," and "sleep quality." Inclusion criteria were experimental studies focusing on ICU patients receiving complementary interventions aimed at improving sleep quality. The methodological quality of included studies was assessed using the Critical Appraisal Skills Programme (CASP).

Results: From 590 initially identified articles, five studies met the inclusion criteria, encompassing 164 participants in the intervention group and 166 in the control group. Interventions included aromatherapy, foot massage, Quranic recitation (Murottal), and interactive music therapy. Most studies reported statistically significant improvements in sleep quality metrics post-intervention. However, variations in study designs, sample sizes, and outcome measures limited the comparability across studies.

Discussion: Complementary nursing interventions, particularly aromatherapy and music-based therapies, show promise in enhancing sleep quality among ICU patients. Despite methodological heterogeneity, consistent findings indicate that such interventions may offer low-cost, culturally adaptable, and nurse-deliverable strategies for holistic patient care. However, the overall body of evidence is still limited by small sample sizes and lack of standardization in sleep quality measurement.

Conclusion: Complementary holistic nursing interventions may effectively enhance sleep quality in ICU patients. Further well-designed randomized controlled trials with standardized outcome assessments are needed to strengthen the evidence base and guide clinical practice.

Keywords: complementary therapy, holistic nursing, sleep quality, ICU, systematic review

INTRODUCTION

Patients admitted to intensive care units (ICUs) often experience critical physiological deterioration and multisystem challenges, placing them at high risk for complications, including sleep disturbances.

The ICU environment itself—characterized by constant noise, invasive monitoring, and psychological stress—can severely disrupt natural sleep-wake cycles, particularly the Rapid Eye Movement (REM) and deep sleep phases (Fang et al., 2021; Mutarobin et al.,

2019). Approximately 50% of ICU patients report poor sleep quality, with frequent nighttime awakenings and difficulty initiating sleep (Deshmukh et al., 2018; Bani Younis & Hayajneh, 2018).

Globally, the prevalence of sleep disorders ranges from 20% to 41%, with chronic insomnia affecting up to 75% of these individuals (Demoule et al., 2022). In Indonesia, estimates suggest that over 23 million individuals suffer from sleep disturbances (Sujarwoto, 2020; Zahara et al., 2018). Sleep deprivation in critically ill patients can exacerbate anxiety, impair immune function, and hinder recovery—factors that necessitate the development of effective, safe, and accessible sleep-promoting interventions.

While pharmacological agents such as benzodiazepines and sedatives remain common in ICU settings, they are associated with risks including delirium, dependence, and respiratory depression (Oldham & Pisani, 2015). Consequently, there is growing interest in non-pharmacological approaches grounded in complementary and holistic nursing care. These include guided imagery, aromatherapy, massage, reflexology, music therapy, and spiritual practices such as prayer and murottal recitation. Such mind-body interventions are designed to modulate both psychological states and physiological processes, thereby improving relaxation and sleep outcomes.

Holistic nursing care emphasizes the integration of body, mind, and spirit in patient management. Complementary therapies, though not part of mainstream medical treatment, are increasingly adopted within ICU nursing practice to promote comfort and healing (Meng et al., 2017). Notably, interventions such as foot massage (Ejindu, 2007) and natural sound music therapy (Wijayanti et al., 2018) have shown positive effects on sleep quality.

Despite the potential of these therapies, few systematic reviews have synthesized their effectiveness in ICU populations. Therefore, this study aims to critically review and appraise current evidence on the use of complementary

holistic nursing therapies to improve sleep quality in adult ICU patients.

METHODS

Study Design

This research employed a systematic literature review design to explore the effects of complementary and holistic nursing interventions on sleep quality among patients in intensive care units (ICUs). The review was conducted in accordance with established guidelines for systematic evidence synthesis, aiming to identify and evaluate existing empirical studies on the subject.

Sample and Eligibility Criteria

The population of interest in this systematic review comprised adult patients admitted to intensive care units (ICUs) who received complementary therapy interventions, with sleep quality identified as either a primary or secondary outcome. The review included peer-reviewed articles published between 2013 and 2022 in both English and Indonesian languages. Studies were considered eligible if they involved ICU patients, implemented complementary therapies as part of the intervention, and evaluated sleep quality outcomes, regardless of whether the patients were mechanically ventilated. Articles were excluded if they did not report sleep-related outcomes, were non-empirical in nature (such as review articles or editorials), or if complementary therapy was not the primary intervention under investigation.

Data Sources and Search Strategy

The literature search was conducted using two primary databases: EBSCOhost and MEDLINE. Keywords and MeSH terms used included: “complementary therapy,” “intensive care unit,” and “sleep quality.” Boolean operators (AND/OR) were used to refine the search. The search was restricted to peer-reviewed journal articles published between January 2013 and December 2022. The reference lists of selected studies were also manually screened to identify additional relevant articles.

Study Selection and Screening Process

The study selection followed a two-stage screening process. First, the titles of all retrieved articles were reviewed for relevance to the research question. Second, abstracts of potentially eligible studies were screened based on the inclusion criteria. Full texts of selected articles were then reviewed comprehensively. Articles that met all inclusion criteria were included in the final analysis.

Data Extraction

Data were extracted using a structured data extraction sheet. Extracted variables included: author(s), publication year, country of origin, research design, sample size and inclusion criteria, type of complementary therapy used, outcome measures related to sleep quality, main findings, and study limitations. The data synthesis focused on identifying patterns and evaluating the impact of each intervention on sleep outcomes.

Instrument and Quality Appraisal

The methodological quality of the included studies was evaluated using the Critical Appraisal Skills Programme (CASP) checklist, which has been adapted and validated in the Indonesian language. The CASP tool consists of 11 items designed to assess the validity, reliability, and relevance of each study. Each item was assessed using a binary scoring system (Yes/No). Only studies that met a minimum quality threshold were included in the final review.

Data Analysis

Data were analyzed narratively due to the heterogeneity of study designs, interventions, and outcome measures. Studies were grouped and synthesized based on the type of complementary therapy used (e.g., music therapy, aromatherapy, massage, etc.) and their effects on sleep quality indicators (e.g., sleep duration, latency, and quality scores). Where available, statistical outcomes were reported to support the findings.

Ethical Considerations

As a secondary analysis of previously published studies, this systematic review did not involve direct human subjects and thus did not require ethical clearance from an institutional review board. However, ethical research practices were upheld by ensuring accurate citation, acknowledgment of all sources, and adherence to transparency and integrity throughout the review process.

RESULT

Search outcomes

The initial database search identified 590 articles. After removing duplicates and screening titles and abstracts, 80 articles were retained for full-text review. Following the application of inclusion and exclusion criteria, 5 studies met the eligibility criteria and were included in this review. The selection process is illustrated in the PRISMA flow diagram (Figure 1).

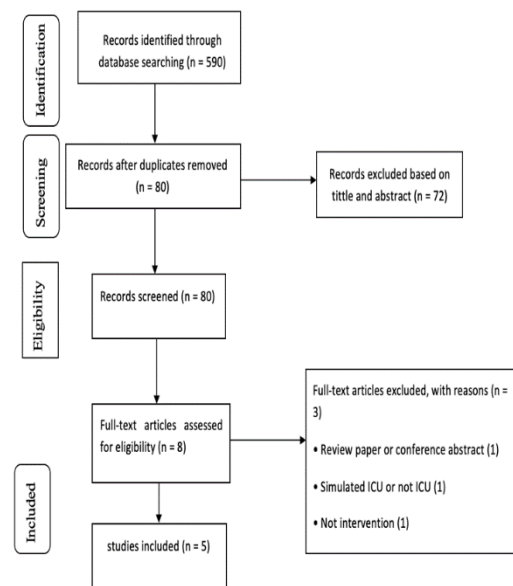


Table 1 presents the characteristics of the included studies. These studies, published between 2015 and 2020, involved interventions such as aromatherapy, foot massage, music therapy, and religious auditory recitation (murottal). Study designs included randomized controlled trials (n=2) and quasi-experimental studies (n=3), with sample sizes ranging from 24 to 156 participants. All studies were conducted in ICU settings and assessed sleep quality using validated instruments such as the Pittsburgh Sleep Quality Index (PSQI) or the Richards-Campbell Sleep Questionnaire (RCSQ).

Table 1: Characteristics of included studies

Title	Source (Year) Country	Design	Setting	Sample size/ Participant Characteristic	Intervention	Result	JB I SCORE
Effects of aromatherapy on patients' worry and sleep quality	Effects of aromatherapy on patients' anxiety and slumber quality, Ezgi Karadag, 2015 Turkey. (Karadag et al., 2017)	A randomized controlled study was conducted with 60 patients in a province located in southeast Turkey	General adult ICU	30th intervention Control: SE = 12.44; 30 M age = 50.33 Male: n = 40 (66.7%) N = 20 (33.3%) women. the seriousness of the condition: CAD	aromatic oil used in aromatherapy.	When I compared the PSQI and BAI scores of the patients in the control and intervention groups before and after the intervention, I discovered statistically significant variations in the shift in favor of the intervention group (p 005).	9
The impact of foot massage and Murottal AL-Qur'an listening on patients' sleep quality in the intensive care unit at Sayang Hospital Cianjur	(Emy salmiyah, 2019). Indonesia (Salmiyah et al., 2019)	Quasi-experimental research design, namely Nonequivalent Control Group Design	General adult ICU	Intervention: 15 Control: 15 M age = - SD = - Male: - Female: - The severity of illness: -	while receiving a murottal Al-Qur'an foot treatment. Using the Pittsburgh Sleep Quality Index, conduct a pre- and post-test (PSG).	The group comprised 15 respondents who were ICU patients. The analysis technique employs the SPSS software's dependent sample T-Test. Nine respondent	8

						s (or 60%) of the 15 participant s in the test reported having poor sleep quality, and six participant s (or 40%) reported having excellent sleep quality. The findings show that there is an impact of foot massage while listening to murottal Al-Qur'an on the patient's quality of sleep, with a p-value of 0.000 rejecting Ho and accepting Ha.	
A Randomized Controlled Study on the Impact of Patient-Directed Interactive Music Therapy on Postoperative Elderly Patients' Sleep Quality	(Jeongmin Kim, 2020). Republic of Korea (Kim et al., 2020)	A Randomized -Controlled Trial	General adult ICU	Intervention: 77 Passive listening: 44 Control: 79 M age = - SD = - Male: n = - Female: n = - The severity of illness: -	Interactive Music Therapy (IMT)	On POD 2, the IMT group significantly outperformed the control group according to the RCSQ (71.50 vs. 56.89, p = 0.012), but the QoR40 did not reveal any differences	9

						between the groups. Due to the immediate postoperative patient's state, it was impossible to perform quality control on the saliva sample, which increased the dropout rate. The IMT group had higher salivary melatonin levels on POD 1 (1.45 vs. 0.04, $p = 0.0068$) than the control group. There was no discernible variation in the cortisol levels between the groups	
Effect of Foot Massage on Patient Sleep Quality in the ICU	(Nurlaily Afianti, 2017). Indonesia (Afianti & Mardhiyah, 2017b)	a quasi-experimental design with a control group, a therapy group, and pretest and posttest evaluations for each group	General adult ICU	Intervention: 12 Control: 12 Male: - Female: - The severity of illness: -	Foot Massage	The findings revealed that while there was no discernible difference in the control group's mean sleep quality score ($p = 0.150$), there was a significant difference in the	8

						therapy group's mean sleep quality score ($p = 0.002$). There was a significant variation in the sleep quality scores between the treatment group and the control group ($p = 0.026$).	
A non-randomized controlled trial examined the impact of aromatherapy on the stress and sleep quality of patients in intensive care units.	(Eun Hee Cho, 2017). The Republic of Korea. (Cho et al., 2017)	An experimental study comparing the stress and sleep quality of two groups of ICU patients used a nonrandomized pre- and post-test design.	General adult ICU	Intervention: 30 Control: 30 M age = 59.50; SD = 9.10 Male: $n = 17$ (56.7%) Female: $n = 13$ (43.3%) The severity of illness: Invasive and non-invasive ventilation support	Aromatherapy	The objective stress index ($F = 25.65$, $p.001$), systolic blood pressure ($F = 9.09$, $p.001$), diastolic blood pressure ($F = 2.47$, $p = .046$), heart rate ($F = 5.71$, $p.001$), and sleep quality ($F = 109.46$, $p.001$) were all significantly different between the experimental group and control group.	9

The first study, conducted by Karadag et al. (2017) in Turkey, was a randomized controlled trial involving 60 adult ICU patients. The intervention group received aromatherapy using lavender essential oil, while the control group received no such treatment. Participants were evaluated using the Pittsburgh Sleep Quality Index (PSQI) and the Beck Anxiety Inventory (BAI). The results indicated statistically significant improvements in both anxiety and sleep quality in the intervention group compared to the control group ($p < 0.005$). This study achieved a high methodological score with a JBI rating of 9.

The second study by Salmiyah et al. (2019), conducted in Indonesia, utilized a quasi-experimental design with nonequivalent control groups. The study involved 30 adult ICU patients, equally divided between intervention and control groups. The intervention combined foot massage with Murottal (Qur'anic) recitation, and sleep quality was measured using the PSQI. Analysis using paired t-tests revealed a significant improvement in the sleep quality of the intervention group, with a p-value of 0.000. The JBI quality score for this study was 8.

Kim et al. (2020) conducted a randomized controlled trial in South Korea to investigate the effect of interactive music therapy (IMT) on postoperative elderly ICU patients. The intervention group, comprising 77 patients, received IMT involving breathing exercises and interactive music sessions, while a separate passive listening group ($n = 44$) and a control group ($n = 79$) were also included. The study used the Richards-Campbell Sleep Questionnaire (RCSQ) and salivary biomarkers to assess outcomes. IMT significantly improved sleep quality scores ($p = 0.012$) and melatonin levels ($p = 0.0068$), though no differences were noted in cortisol levels or quality of recovery (QoR40). The study received a JBI score of 9.

The fourth study, by Afianti and Mardhiyah (2017), was conducted in Indonesia and applied a quasi-experimental design with pre- and post-tests in both

intervention and control groups. A total of 24 ICU patients participated, with 12 in each group. The intervention consisted of foot massage therapy. Results showed a significant improvement in sleep quality scores in the intervention group ($p = 0.002$), whereas the control group did not exhibit statistically meaningful changes. The between-group difference was also significant ($p = 0.026$). This study received a JBI score of 8.

Lastly, Cho et al. (2017) conducted a non-randomized controlled trial in South Korea to assess the effects of aromatherapy on ICU patients receiving invasive and non-invasive ventilation. The sample consisted of 60 patients evenly divided between intervention and control groups. The intervention included the application of lavender essential oil, and outcomes were assessed through both physiological measures (blood pressure, heart rate) and sleep quality scores. The results showed significant improvements in sleep and stress-related outcomes in the aromatherapy group compared to controls, with all reported p-values indicating strong statistical significance. This study also received a JBI score of 9.

These findings collectively demonstrate that various complementary therapies, including aromatherapy, music therapy, foot massage, and spiritual auditory practices, can contribute to improved sleep quality among critically ill patients in ICU settings. Most studies showed strong methodological quality, though sample sizes and design variability suggest the need for further robust research.

DISCUSSION

This systematic review synthesized evidence from five experimental and quasi-experimental studies examining the effects of complementary and holistic nursing interventions on sleep quality among adult patients in intensive care units (ICUs). The findings collectively support the efficacy of non-pharmacological interventions—such as aromatherapy, foot massage, music therapy, and spiritual practices like murottal

recitation—in improving sleep quality. These results align with the global trend toward integrating complementary therapies into ICU care to address the limitations and risks associated with pharmacological sedation.

Effectiveness of Complementary Interventions

All included studies demonstrated statistically significant improvements in sleep outcomes among intervention groups compared to controls. For example, aromatherapy with lavender essential oil showed consistent benefits across multiple studies (Karadag et al., 2017; Cho et al., 2017), likely due to its anxiolytic and sedative properties via the limbic system and modulation of cortisol levels. These findings are consistent with prior reviews emphasizing lavender's sleep-promoting effects in hospitalized patients (Lee et al., 2021).

Music therapy, both passive and interactive, also showed promising outcomes. Kim et al. (2020) found that interactive music therapy (IMT) not only improved subjective sleep scores but also elevated melatonin levels, reinforcing the biological plausibility of music's effect on circadian regulation. Music with specific rhythmic patterns has been shown to entrain autonomic functions and promote parasympathetic activity, contributing to sleep facilitation (Lai & Good, 2006).

In the Indonesian context, foot massage and murottal recitation emerged as culturally tailored interventions that significantly improved sleep quality (Salmiyah et al., 2019; Afianti & Mardhiyah, 2017). These findings support the integration of spiritual and culturally congruent practices in nursing care for Muslim-majority populations. Similar studies in Middle Eastern ICUs have highlighted the therapeutic role of Quranic recitation in reducing anxiety and sleep disturbances (Alnasser et al., 2021).

Although the findings are encouraging, several methodological limitations must be considered. Most included studies had small sample sizes and were conducted in single

centers, limiting generalizability. Only two studies employed full randomization and blinding protocols (Karadag et al., 2017; Kim et al., 2020), raising the possibility of selection and performance biases in the remaining studies. The heterogeneity in intervention duration, outcome measures (e.g., PSQI, RCSQ), and ICU populations (e.g., ventilated vs. non-ventilated patients) also restricts the ability to conduct meta-analysis or directly compare effect sizes.

Moreover, few studies reported on long-term outcomes or follow-up assessments beyond the intervention period. This limits our understanding of the sustainability of sleep improvements induced by complementary therapies. In future studies, more rigorous designs with larger, multicenter samples, standardized protocols, and extended follow-up periods are needed to establish causal inferences and assess long-term effectiveness.

The findings of this review have important implications for ICU nursing practice. Incorporating evidence-based complementary therapies as adjuncts to standard care may enhance patient comfort, reduce reliance on sedatives, and potentially improve recovery outcomes. Interventions like aromatherapy and music therapy are relatively low-cost, non-invasive, and feasible to implement in resource-limited settings, especially when delivered by trained nursing staff.

Furthermore, culturally aligned therapies such as murottal recitation can strengthen patient-centered care in Muslim-majority countries by addressing both psychological and spiritual needs. These interventions may also enhance the therapeutic alliance between patients and nurses, improving overall care satisfaction and trust in critical care settings.

This review is not without limitations. First, the number of included studies was limited ($n=5$), which may not capture the full spectrum of available evidence. Second, publication bias cannot be ruled out, as only studies in English and Indonesian were considered, and gray literature was excluded. Third, although quality appraisal was

conducted using the CASP checklist, more comprehensive tools such as the Cochrane Risk of Bias 2.0 or GRADE could offer greater insight into the strength of evidence.

CONCLUSION

This systematic review provides preliminary yet compelling evidence that complementary holistic nursing therapies—including aromatherapy, music therapy, foot massage, and religious auditory recitation—can effectively enhance sleep quality among adult ICU patients. These interventions offer non-pharmacological alternatives that are both culturally sensitive and clinically feasible within critical care settings.

Given the high prevalence of sleep disturbances and the risks associated with sedative pharmacotherapy in ICU patients, the integration of these complementary therapies into nursing practice may represent a significant advancement in patient-centered care. However, the small number of high-quality studies and variability in intervention protocols underscore the need for further large-scale, multicenter randomized trials with standardized outcome measures.

In conclusion, complementary holistic nursing therapies should be considered as adjunctive approaches to improve sleep quality in ICU care. Future research should aim to validate these findings across diverse populations and healthcare settings, while also evaluating their cost-effectiveness and long-term impact on clinical outcomes.

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