



Nursing Interventions and Strategies for Enhancing Sleep Quality in Hospitalized Patients: A Comprehensive Review

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Abstract

Background: Sleep quality is crucial for the recovery of hospitalized patients, as inadequate sleep can lead to negative health outcomes such as prolonged recovery, increased pain perception, and psychological distress. Environmental factors in hospitals often disrupt sleep, necessitating effective nursing interventions to enhance sleep quality.

Methods: This comprehensive review and meta-analysis examined existing literature on nursing interventions aimed at improving sleep quality in hospitalized patients. A systematic search was conducted across multiple databases, including PubMed, Scopus, and Cochrane Library, using relevant keywords and MeSH terms related to sleep disorders and nursing interventions. Studies were evaluated for their impact on sleep quality using standardized instruments such as the Pittsburgh Sleep Quality Index (PSQI) and the Sleep Medicine History and Sleep Questionnaire (SMHSQ).

Results: The analysis revealed that several nursing interventions significantly improved sleep quality among hospitalized patients. Notably, the use of earplugs and eye masks, relaxation

techniques, music therapy, and aromatherapy demonstrated positive effects on both sleep duration and quality. However, substantial heterogeneity was noted among studies, indicating variability in intervention effectiveness and research methodology.

Conclusion: The findings suggest that targeted nursing interventions can effectively enhance sleep quality in hospitalized patients. Despite the promising results, the study highlights the need for more rigorous, randomized controlled trials to establish clear evidence regarding the efficacy of specific interventions. The diverse methodologies and small sample sizes in many studies limit the generalizability of these findings, emphasizing the necessity for further research in this area.

Keywords: Sleep quality, Nursing interventions, Hospitalized patients, Meta-analysis, Relaxation techniques

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1. Introduction

The quality of sleep is essential for the recovery of patients in a hospital environment. Sufficient sleep facilitates physiological, cognitive, and emotional rejuvenation, which are vital for the healing process [1, 2]. Inadequate sleep quality may result in adverse effects including immunological suppression, delayed wound healing, increased pain perception, psychosis, and extended hospitalizations [3]. Moreover, hospitalized patients often encounter environmental elements that might hinder their sleep, such as noise, light, frequent disturbances, and inadequate bedding [4, 5]. Consequently, healthcare practitioners must prioritize the execution of interventions designed to enhance sleep quality for hospitalized patients.

Considering the substantial influence of sleep quality on patient outcomes, healthcare practitioners must include sleep enhancement in standard treatment protocols. Nursing therapies, including non-pharmacological strategies, seek to alleviate environmental conditions that may interfere with patients' sleep, including noise and light exposure [6]. These treatments also include the promotion of proper sleep hygiene via the establishment of consistent sleep-wake cycles and the provision of scheduled quiet periods. Additionally, physical equipment such as earplugs and eye masks, along with relaxation methods like massage treatment, muscular relaxation, visualization, and therapeutic touch, may be used to mitigate the adverse consequences of inadequate sleep in hospital environments. Alternative treatments such as aromatherapy and acupuncture have been proposed as viable methods to enhance sleep quality for patients [11].

Numerous systematic studies have shown the efficacy of nursing treatments in enhancing sleep across diverse patient groups [12-14]. Nonetheless, prior research indicated that the clinical data available at the time were inadequate, necessitating more Randomized Controlled Trials (RCTs) to evaluate effectiveness. As a result, there is insufficient clear information about the efficacy of nursing treatments in improving sleep quality in hospitalized patients. Consequently, doing this study was essential for evaluating previous findings. The main aim of this systematic review and meta-analysis was to ascertain whether significant scientific data demonstrates that nurse interventions positively affect sleep quality in hospitalized patients. The objective of this examination was to discover, assess, and compare all available research pertinent to this topic. This is the most thorough and exhaustive systematic review and meta-analysis undertaken to investigate this topic, to the best of our knowledge.

2. Methods

Publications were searched in the databases PubMed/MEDLINE, Scopus, Web of Science, EMBASE, ProQuest, Science Direct, and Cochrane Library up to September 2022. The search strategy utilized MeSH terms and keywords including “sleep disorder,” “sleep deprivation,” “sleep apnea,” “insomnia,” “sleep latency,” “rapid eye movement,” “non-rapid eye movement,” “sleep stage,” “sleep quality,” “sleep time,” “sleep-wake disorder,” in conjunction with “intensive care,” “intensive care unit,” “critical care,” “ICU,” “CCU,” “hospitalized patients,” “critical patients,” “non-critical patients,” and “nursing interventions,” “non-pharmacological interventions,” “alternative therapies,” “music therapy,” “massage therapy,” “muscle relaxation,” “cognitive therapy,” “behavior therapy,” “physical therapy,” “aromatherapy,” “acupuncture,” “eye masks,” and “earplugs.” Primary article references were further examined to discover possibly related research. All relevant papers that satisfied the selection criteria were assessed.

3. Analysis of Sensitivity

In the comprehensive analysis, significant heterogeneities were noted across studies using the PSQI ($I^2 = 98.45\%$, $P < 0.001$) and the SMHSQ ($I^2 = 95.17\%$, $P < 0.001$) sleep quality evaluation instruments. To examine the impact of each research on the SMD, we performed supplementary meta-analyses by excluding one study at a time. The findings indicated that the research conducted by Zolfaghari et al. [15] and Farokhnezhad Afshar [16] had the most significant influence on the overall index. These two research studies exaggerated the impact magnitude of improvements in sleep quality. Upon eliminating these two investigations, the estimate became marginally significant ($SMD = -4.14$, $95\% \text{ CI} = -5.25 \text{ to } -3.03$). The study by Otaghi et al. [17] had the most significant influence on the overall SMD in the research evaluating sleep quality using the SMHSQ. This research overstated the extent of the effect on enhancing sleep quality ($SMD = -1.87$, $95\% \text{ CI} = -2.82 \text{ to } -0.91$).

The use of earplugs, eye masks, or a combination thereof has repeatedly shown a beneficial impact on the sleep quality of hospitalized patients. This is corroborated by studies [18-29] in the review section and five research [15,30-33] used in the meta-analysis. These results align with our prior research [7]. The influence of relaxation therapies, including therapeutic massage, Hatha Yoga, muscular relaxation, reflexology, and foot baths, on sleep quality in hospitalized patients was examined in 10 out of 77 assessed research. Of the ten investigations, three [25, 34, 35] were included in the meta-analysis, demonstrating the beneficial impact of relaxation methods on sleep quality. Of the remaining seven studies [36-41] that were systematically reviewed, five [41-45] showed a substantial improvement in sleep quality after the use of relaxation methods. The findings align with other research, notably a comprehensive review [34], which indicated the beneficial benefits of therapeutic massage on stress, anxiety, pain, and sleep quality in adult ICU patients. The research indicates that relaxation methods may effectively improve sleep quality in hospitalized individuals. The review indicates that 83% of the research included in the systematic part demonstrates the beneficial effects of music therapies on patients' sleep quality [36,37,40,42,43]. This conclusion is also corroborated by the meta-analysis, which validates the beneficial benefits of music therapies [26, 30, 39].

Numerous therapies have shown a beneficial effect on the quality and quantity of sleep, according to the findings of different research. The interventions include the implementation of quiet time [32-36] and the reduction of noise levels [37,38,40,41] as components of sleep hygiene practices, the use of care-behavioral approaches [44], and the modification of ventilator modes

[43,46,47]. Nonetheless, variability in research design and evaluation instruments across diverse clinical environments rendered it impractical to statistically aggregate these findings. Moreover, the integration of therapies like music therapy with eye masks/earplugs or oral melatonin with eye masks/earplugs has shown enhanced results, as shown by much research [24-29]. These studies have found statistically significant changes between the intervention and control groups. However, the absence of stringent methodological techniques undermines the robustness of the acquired findings.

4. Advantages and Disadvantages

This research included a comprehensive literature review in both Persian and English, with no constraints on publication dates. Furthermore, we meticulously examined the reference lists of pertinent papers. This research is the first investigation concentrating on the impact of nursing interventions on the sleep quality of hospitalized patients. We achieved compliance with stringent PRISMA requirements in our study process. Furthermore, the risk of bias for each research was evaluated using either the Jadad grading scale or the JBI quality evaluation tool. Sensitivity analysis and meta-regression analysis were performed to verify the robustness of the results. Nonetheless, it is essential to recognize the limitations of this research. Initially, among the 77 relevant papers, only data from 18 were included in the meta-analysis, which may restrict the generalizability of the results. The investigations demonstrated variability owing to differences in demographic and clinical features of the population, which may have affected the results. The limited sample sizes of the included studies may affect the statistical power and accuracy of the findings. The brief length of assessment periods in some research may restrict our comprehension of the therapies' long-term impact. The use of several subjective and objective sleep evaluation methodologies in research creates the potential for discrepancies and biases in the results. Finally, the existence of methodological restrictions, including the absence of double blinding, raises apprehensions about the trustworthiness and precision of the data obtained. Consequently, the findings of this research must be interpreted judiciously, taking these limitations into account.

5. Conclusions

Our data reveal that several individual research suggests nurse interventions may improve both the duration and quality of sleep in hospitalized patients. It is essential to acknowledge that the majority of the studies included were restricted to qualitative synthesis because of discrepancies in intervention types, control groups, demographics, outcome assessments, and dependence on self-reported results. We performed a meta-analysis using two measuring instruments (PSQI and SMHSQ) to evaluate the efficacy of these therapies on sleep. The investigation demonstrated a beneficial impact on both the amount and quality of sleep in hospitalized patients for four particular interventions: earplugs and eye masks, relaxation methods, music therapy, and aromatherapy. It is essential to use care in interpreting these findings owing to the varying methodological quality and heterogeneity of the included research. Formulating conclusive assessments of the effectiveness of various treatments is difficult. Nonetheless, these results provide a thorough dataset to examine the existing evidence and provide prospective topics for further research.

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التدخلات التمريضية والاستراتيجيات لتحسين جودة النوم لدى المرضى المقيمين في المستشفى: مراجعة شاملة

الملخص

الخلفية: تعتبر جودة النوم أساسية لشفاء المرضى المقيمين في المستشفى، حيث أن النوم غير الكافي يمكن أن يؤدي إلى نتائج صحية سلبية مثل إطالة فترات الشفاء وزيادة إدراك الألم والضيق النفسي. وغالباً ما تعطل العوامل البيئية في المستشفيات النوم، مما يستدعي وجود تدخلات تمريضية فعالة لتحسين جودة النوم.

الطرق: قامت هذه المراجعة الشاملة والتحليل التلوي بفحص الأدبيات الموجودة حول التدخلات التمريضية التي تهدف إلى تحسين جودة النوم لدى المرضى المقيمين في المستشفى. تم إجراء بحث منهجي عبر قواعد بيانات متعددة، بما في ذلك PubMed و Scopus و Cochrane Library، باستخدام كلمات رئيسية وعبارات مصطلحات MeSH ذات الصلة باضطرابات النوم والتدخلات التمريضية. تم تقييم الدراسات من حيث تأثيرها على جودة النوم باستخدام أدوات موحدة مثل مؤشر جودة النوم في بيتسبرغ (PSQI) واستبيان تاريخ النوم والطب النوم (SMHSQ).

النتائج: أظهر التحليل أن العديد من التدخلات التمريضية حسنت بشكل كبير جودة النوم بين المرضى المقيمين في المستشفى. ومن الجدير بالذكر أن استخدام سدادات الأذن وقناع العين وتقنيات الاسترخاء وعلاج الموسيقى والعلاج بالروائح أظهر تأثيرات إيجابية على كل من مدة النوم وجودته. ومع ذلك، فقد لوحظ تباين كبير بين الدراسات، مما يشير إلى وجود تباين في فعالية التدخلات ومنهجيات البحث.

الاستنتاج: تشير النتائج إلى أن التدخلات التمريضية المستهدفة يمكن أن تعزز بشكل فعال جودة النوم لدى المرضى المقيمين في المستشفى. على الرغم من النتائج المشجعة، تبرز الدراسة الحاجة إلى مزيد من التجارب العشوائية المنضبطة الأكثر صرامة لتأسيس دليل واضح بشأن فعالية التدخلات المحددة. تحد من قابلية تعميم هذه النتائج المنهجيات المتنوعة وحجم العينة الصغيرة في العديد من الدراسات، مما يؤكد على ضرورة إجراء مزيد من الأبحاث في هذا المجال.

الكلمات المفتاحية: جودة النوم، التدخلات التمريضية، المرضى المقيمون في المستشفى، التحليل التلوي، تقنيات الاسترخاء