Dunia Keperawatan: Jurnal Keperawatan dan Kesehatan @JDK 2025
DOI: 10.20527/dk.v13i2.253 eISSN: 2541–5980; pISSN: 2337-8212
Received May 2024, Accepted June 2025

Effectiveness of Progressive Muscle Relaxation on Sleep Quality: A Systematic Review

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ABSTRACT
Progressive muscle relaxation (PMR) is a therapeutic technique that involves sequentially tensing and relaxing muscle groups to promote physical and mental relaxation. It is widely used to improve sleep quality, particularly in adults experiencing sleep disturbances. This systematic review aimed to examine the effectiveness of PMR in enhancing sleep quality. A systematic literature search was conducted using four electronic databases—ScienceDirect, Scopus, PubMed, and CINAHL—covering publications from 2017 to 2022. The keywords used were "progressive muscle relaxation" and "sleep quality." A total of 1,085 articles were initially identified. After applying inclusion and exclusion criteria based on the PICOT framework (Population, Intervention, Comparison, Outcome, and Time), and following a multi-stage screening process, seven studies were included in the final analysis. The included studies consisted of randomized controlled trials (RCTs) and clinical observational studies involving adult participants. The methodological quality of each study was assessed using the Joanna Briggs Institute (JBI) critical appraisal checklist. All seven studies reported statistically significant improvements in sleep quality following the implementation of PMR. However, variations were found in participant characteristics, duration and frequency of the PMR intervention, and the use of adjunct therapies. Progressive muscle relaxation, when performed under professional supervision, is an effective non-pharmacological intervention to improve sleep quality in adults.

Keywords: Progressive Muscle Relaxation, Sleep Quality, Systematic Review

Cite this as: Farida N, Bakar A and Pratiwi IN. (2025). Effectiveness of Progressive Muscle Relaxation on Sleep Quality: A Systematic Review. Dunia Keperawatan; 13(2): 191-197. DOI: 10.20527/dk.v13i2.253

INTRODUCTION

Sleep plays a critical role in maintaining physiological functions and supporting the healing process. However, patients often experience disrupted sleep during hospitalization. Studies indicate that between 47% and 67% of hospitalized individuals suffer from sleep disturbances, influenced by environmental factors and medical care (10). Approximately 50% of hospitalized patients report difficulties initiating sleep, and, on average, obtain 1.5 fewer hours of sleep compared to when they are at home.

Previous large-scale, multicenter studies have demonstrated that sleep disturbances in hospitalized patients are associated with various modifiable hospital-related factors (12). These findings highlight the importance of increasing healthcare professionals' awareness of the significance of sleep and the implementation of interventions aimed at minimizing factors that disrupt rest. Nurses, in particular, play a pivotal role in supporting patients' psychosocial adaptation, promoting emotional regulation, and fulfilling basic needs to foster a more comfortable hospital environment (5).

Progressive Muscle Relaxation (PMR) is a relaxation technique that involves deep breathing in combination with systematic tensing and releasing of specific muscle groups. This method has been shown to elicit psychological relaxation, reduce stress, and lower cortisol levels (11). The core principle of PMR is to induce relaxation in targeted muscle areas following deliberate tension, which enhances bodily awareness and sensitivity to muscle tension over time (8).

Additionally, PMR can be performed without specific timing or setting and does not require advanced technology or equipment. It also offers the added benefit of strengthening the therapeutic relationship between healthcare providers and patients. This systematic review aims to evaluate the effectiveness of progressive muscle relaxation in improving sleep quality among hospitalized patients.

METHODS

A systematic search was conducted using the following electronic databases: ScienceDirect, Scopus, PubMed, and CINAHL. The primary search terms employed were “progressive muscle relaxation” and “sleep quality.” Although the literature on this topic is limited, seven relevant articles were identified and included in the review.

The review focused on adult patients receiving care in a hospital setting. Inclusion criteria were established based on the Population, Intervention, Comparison, Outcome, and Time (PICOT) framework. The intervention involved the application of progressive muscle relaxation techniques. Studies included were published within the last five years and comprised randomized controlled trials (RCTs) and clinical observational studies that evaluated sleep quality as the primary outcome. Articles were excluded if they were abstracts only, lacked full-text access, or did not describe the intervention in detail.

The methodological quality of each selected article was appraised using the Joanna Briggs Institute (JBI) critical appraisal checklist. Risk of bias assessments were independently conducted by reviewers, and any disagreements were resolved through discussion.

The systematic review process involved identifying relevant studies using the aforementioned databases, limited to the years 2017–2022. A total of 1,085 articles were initially retrieved. After removing duplicates and applying the inclusion criteria, 830 articles were screened for eligibility. Titles and abstracts of 110 articles were reviewed in detail, and seven studies were ultimately included based on full-text analysis and methodological rigor as evaluated through the JBI appraisal tool.

RESULTS AND DISCUSSION

From the initial 1,085 articles, 830 remained after duplicate removal. Following abstract and full-text screening, seven studies met the inclusion criteria. These studies demonstrated an overall low risk of bias, particularly among the clinical observational studies. Most of the studies employed the JBI methodology and randomized controlled trial (RCT) designs. However, due to the nature of the intervention, blinding of participants was challenging in studies involving progressive muscle relaxation. Despite this limitation, all selected studies reported significant improvements in sleep quality following the intervention.

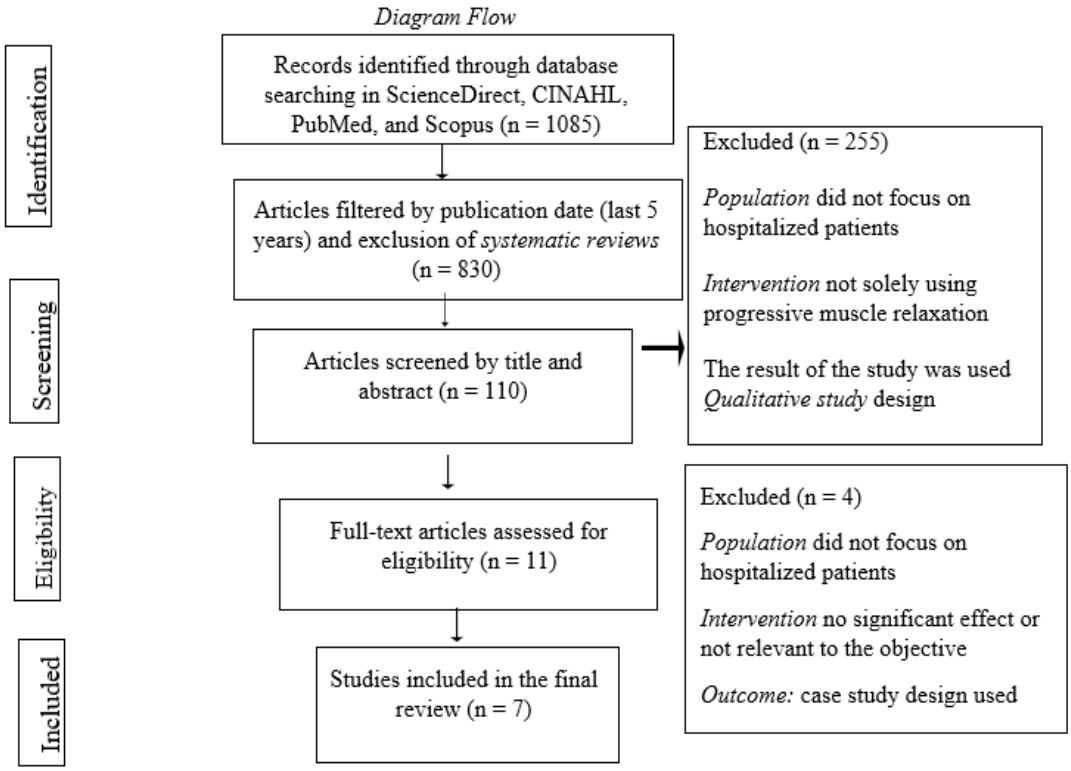

Figure 1. Diagram Flow

Table 1. Literature Quality Evaluation Form (adapted from the JBI Critical Appraisal Tool, 2020)

No	Studies	Questions													Quality
		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	
1	Harorani et al., 2020	Y	N	Y	Y	N	N	N	Y	Y	Y	Y	Y	Y	High
2	Liu et al., 2020	Y	N	Y	Y	N	N	N	Y	Y	Y	Y	Y	Y	High
3	Seyedi Chegeni et al., 2018	Y	N	Y	Y	N	N	U	Y	Y	Y	Y	Y	Y	High
4	Aksu et al., 2018	Y	N	Y	N	U	N	U	U	Y	Y	Y	Y	Y	Moderate
5	Özlü et al., 2021	Y	N	Y	N	N	U	U	Y	Y	Y	Y	Y	Y	High
6	Bahçeli & Karabulut, 2020	Y	N	Y	N	N	Y	U	Y	Y	Y	Y	Y	Y	High
7	Xiao et al., 2020	Y	N	Y	U	U	U	N	U	Y	Y	Y	Y	Y	Moderate

Note. Y = Yes; N = No; U = Unclear.

Quality Appraisal Questions:
Q1. Was true randomization used for the assignment of participants to treatment groups?
Q2. Was allocation to treatment groups adequately concealed?
Q3. Were treatment groups similar at baseline?
Q4. Were participants blinded to treatment assignment?
Q5. Were those delivering the treatment blinded to treatment assignment?
Q6. Were outcome assessors blinded to treatment assignment?

Quality Appraisal Questions (Continued):
Q7. Were treatment groups treated identically apart from the intervention of interest?
Q8. Was follow-up complete? If not, were differences in follow-up between groups adequately described and analyzed?
Q9. Were participants analyzed in the groups to which they were originally randomized?
Q10. Were outcomes measured in the same way across treatment groups?
Q11. Were outcomes measured using reliable methods?
Q12. Was appropriate statistical analysis applied?
Q13. Was the trial design appropriate, and were any deviations from the standard RCT design (e.g., individual randomization, parallel groups) appropriately addressed in both the conduct and analysis of the trial?

Table 2. Summary of Reviewed Articles on Progressive Muscle Relaxation and Sleep Quality

No	Author	Method	Results
1	Harorani *et al.*, 2020	Design : Randomized Clinical Trial Sample: 80 burn patients Intervention: Progressive muscle relaxation	The study demonstrated that progressive muscle relaxation significantly reduced anxiety levels and improved sleep quality in burn patients.
2	Liu *et al.*, 2020	Design: Randomized Clinical Trial Sample: 51 patients with COVID-19 in isolation. Intervention: Progressive muscle relaxation	Progressive muscle relaxation, as a complementary method, was effective in reducing anxiety and enhancing sleep quality in patients with COVID-19.
3	Seyedi Chegeni *et al.*, 2018	Design: Randomized Clinical Trial Sample: 91 patients with COPD Intervention: Progressive muscle relaxation	Although no significant difference was found in overall fatigue, progressive muscle relaxation improved subjective sleep quality, sleep latency, duration, and efficiency.
4	Aksu, Erdogan and Ozgur, 2018	Design: Randomized Clinical Trial Sample: 26 patients undergoing pulmonary resection Intervention: Progressive muscle relaxation	Progressive muscle relaxation helped prevent deterioration in sleep quality following pulmonary resection.
5	Özlü *et al.*, 2021	Design: Randomized Clinical Trial Sample: 67 patients with COVID-19 Intervention: Progressive muscle relaxation	Progressive muscle relaxation exercises significantly reduced anxiety and improved sleep quality in patients with COVID-19.
6	Bahçeli and Karabulut, 2020	Design: Randomized Clinical Trial Sample: 97 patients undergoing lumbar microdiscectomy. Intervention: Progressive muscle relaxation	Progressive muscle relaxation served as an effective nursing intervention to reduce pain and anxiety, while also improving sleep quality.
7	Xiao *et al.*, 2020	Design: Clinical Observational Study Sample: 79 patients with COVID-19 Intervention: Progressive muscle relaxation	Progressive muscle relaxation significantly reduced anxiety and depression and enhanced sleep quality in COVID-19 patients during isolation.

Findings from previous studies suggest that progressive muscle relaxation (PMR) significantly reduces anxiety and improves sleep quality, particularly in burn patients. Harorani et al. (2020) concluded that PMR serves as a cost-effective complementary therapy, supporting both psychological well-being and sleep improvement during the burn treatment process (4).

In line with these findings, Aksu, Erdogan, and Ozgur (2018) reported that PMR is a non-invasive, economical, and practical intervention that can be easily implemented during the hospital stay, including in post-operative intensive care units (1). They emphasized that such interventions should be incorporated into routine care by the medical team.

Further evidence comes from studies involving COVID-19 patients. Özlü et al. (2021) found that PMR effectively reduced anxiety and improved sleep quality without the adverse side effects commonly associated with pharmacological treatments (7). Similarly, Liu et al. (2020) and Xiao et al. (2020) reported that PMR significantly alleviated anxiety and depression symptoms and enhanced sleep quality during isolation therapy (6). Xiao et al. also recommended clinical promotion of this technique due to its positive impact on treatment outcomes (13).

Other studies support the application of PMR in various clinical settings. Bahçeli and Karabulut (2020) demonstrated that PMR improved pain management, reduced anxiety, and enhanced sleep quality in patients undergoing lumbar microdiscectomy (3). Seyedi Chegeni et al. (2018) further noted that PMR was effective in reducing fatigue and anxiety and improving sleep in patients with chronic obstructive pulmonary disease (COPD) (9). Relaxation techniques have also been shown to reduce complications following lung resection and improve post-cesarean recovery, including sleep quality (2).

In COVID-19 cases, the high transmission rate and effects of isolation contribute to increased anxiety and disrupted sleep. Liu et al. (2020) emphasized the need for PMR to be taught to caregivers and patients as part of a broader adjuvant therapy strategy (6). PMR was found to reduce fatigue and improve specific components of sleep quality such as sleep efficiency, subjective sleep perception, sleep latency, and duration, although not all sleep subscales showed improvement. Seyedi Chegeni et al. (2018) highlighted the role of nurses in symptom management, recommending that PMR be included in the rehabilitation care plan for patients with chronic illnesses such as COPD (9). Patients could also practice PMR at home under supervision, contributing to improved long-term outcomes.

Overall, the reviewed studies consistently support the effectiveness of PMR as a complementary intervention for enhancing sleep quality and reducing anxiety in hospitalized patients. All seven reviewed articles concluded that PMR has a positive impact on sleep outcomes in various clinical populations, including those with COPD, COVID-19, burn injuries, and patients undergoing surgical procedures such as lumbar microdiscectomy or pulmonary resection.

CONCLUSION

Progressive muscle relaxation, when administered under professional supervision, is a highly effective intervention for improving sleep quality among adult patients. It has been shown

to benefit individuals suffering from anxiety and sleep disturbances across a range of clinical conditions, including COVID-19, COPD, burn injuries, lumbar microdiscectomy, and pulmonary resection. As a non-pharmacological, cost-effective, and easily administered technique, PMR holds substantial promise as an adjunct therapy in both hospital and home care settings.

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