



## **Non-Pharmacological Interventions to Overcome Postoperative Fatigue**

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### **Abstract**

Surgery is a medical procedure that involves invasive actions on certain parts of the body. Fatigue is often experienced by postoperative patients related to changes in hemodynamic status, sedation and so on. It is essential to manage postoperative fatigue in order to prevent delayed recovery and improve quality of life. This literature review aims to identify the nonpharmacological intervention to managing postoperative fatigue. The method use was a narrative review study, The review was conducted several databases ScienceDirect, PubMed, Springer, Sagepub and google scholar, to search data from 2018 to 2024. The keywords used were nonpharmacologic intervention and postoperative fatigue. The results of this study retrieved nine articles reviewed, which were eight article randomized control trials and one article quasi experimental. The review found that the interventions to manage postoperative fatigue are progressive muscle relaxation, Benson relaxation and early exercise. Based on the results of the review, it was found that every specific interventions on specific subject were proven to overcome postoperative fatigue. The study findings provide information for nurses regarding postoperative fatigue management in order to improve the quality of life.

**Keywords:** Intervention, Nonpharmacologic, Postoperative Fatigue

### **INTRODUCTION**

Surgery is a medical procedure that consists of invasive actions with a specific purpose. Surgery is even one of the most crucial efforts in treating cancer(Tohme et al., 2017). Surgery consists of preoperative, intraoperative and postoperative phases. The postoperative phase is an advanced phase that focuses on adverse effect control and recovery.

During surgery, patients experience changes in homeostasis, circulation and sedation(Lee et al., 2024). these conditions

can cause changes in metabolism and energy availability. Decreased amount of available energy caused fatigue shortly after the patient undergoes surgery. this condition could be aggravated by the inflammatory process which also affects metabolism. although the exact mechanism of fatigue has yet to be explained as it is related to many factors (Hiensch et al., 2021).

Fatigue is described as physical and psychological powerlessness that could

reduce productivity and quality of life (Nugraha & Ramdhanie, 2023). Postoperative fatigue can lead to delayed recovery and disruption of daily activities. Thus, it is necessary to develop a fatigue management strategy (Ljungqvist et al., 2017) in order to accelerate recovery and improve quality of life especially using non-pharmacological interventions that are simple, inexpensive, and do not require any specific equipment.

This study aims to identify non-pharmacological interventions to overcome postoperative fatigue.

## RESEARCH METHOD

The research method is a narrative review. The databases used consisted of Sciencedirect, Google scholar, Pubmed and Sagepub. article selection criteria included, publication year between 2018-2024, English language, full manuscript available, randomized controlled trial (RCT) and quasi experimental research. Review articles were excluded in this study. the keywords used were [postoperative fatigue] AND [non-pharmacologic] AND [intervention] OR [management]. Articles

that met the criteria were presented in tabular form and analyzed based on their content. the search engine used was google scholar and the search features contained in each database. The results of the article search found nine articles that met the predetermined criteria.

The article search process follows the following procedure.

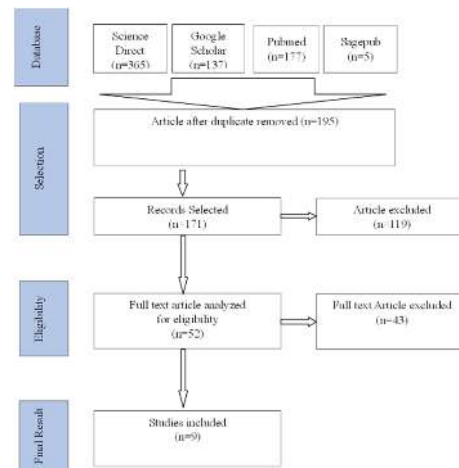


Fig.1 Article search procedure

## RESEARCH RESULT AND DISCUSSION

Based on searches in several databases, 9 (nine) articles were found that were in accordance with the focus of the research. the following are the articles obtained during the search according to the predetermined criteria

Table 1. Article Source and Publication

| No | Title   | Year | Database       |
|----|---|------|----------------|
| 1  | Effect of progressive muscle relaxation on postoperative pain, fatigue, and vital signs in patients with head and neck cancers: A randomized controlled trial | 2022 | Science Direct |
| 2  | The effect of reflexology on pain, anxiety, fatigue, and sleep in patients undergoing coronary artery bypass graft surgery: A randomized controlled trial     | 2024 | Science Direct |

|   |  |      |                |
|---|--|------|----------------|
| 3 | Early initiated postoperative rehabilitation reduces fatigue in patients with operable lung cancer: A randomized trial                         | 2018 | Science Direct |
| 4 | Effect of progressive muscle relaxation on sleep quality and fatigue among post valvular heart surgery patients                                | 2021 | Google Scholar |
| 5 | Effect of Progressive Muscle Relaxation on Pain and Fatigue among Post Cardiac Surgery Patients  | 2020 | Google Scholar |
| 6 | Progressive muscle relaxation technique effectiveness on pain and fatigue among post mastectomy women: A quasi-experimental study              | 2022 | Google Scholar |
| 7 | Effects of progressive muscle relaxation exercises on the vital signs and fatigue in kidney transplant patients: a randomized controlled trial | 2024 | Springer       |
| 8 | Effect of Benson Muscle Relaxation Technique on Incisional Pain, Fatigue, and Anxiety Levels among Patients Post Abdominal Surgery             | 2022 | Google Scholar |
| 9 | Effects of Progressive Relaxation Exercises on Vital Signs and Fatigue in Liver Transplant Patients: A Randomized Controlled Trial             | 2022 | Sagepub        |

Based on table 1, it is informed that of the nine articles retrieved, three articles came from science direct, four articles from google scholar, and one article from sage and springer. based on the year of

publication, the oldest year is 2018 and the latest year is 2024. the majority of articles come from 2022. next, the search result articles will be displayed in the table below.

Table 2. Retrieved Article Met Criteria

| No | Title   | Intervention                  | Result  |
|----|---|-------------------------------|---|
| 1  | Effect of progressive muscle relaxation on postoperative pain, fatigue, and vital signs in patients with head and neck cancers: A randomized controlled trial | Progressive muscle relaxation | PMR significantly reduces sleep disturbances and levels of fatigue, anxiety, and depression compared with the control group with time trend ( $p < 0.01$ ) (Loh et al., 2022)                     |
| 2  | The effect of reflexology on pain, anxiety, fatigue, and sleep in patients undergoing coronary artery bypass graft surgery: A randomized controlled trial     | Reflexology                   | After applying reflexology on the first, second, and third postoperative days, fatigue scores respectively were statistically significantly lower in reflexology group compared to control group. |
| 3  | Early initiated postoperative rehabilitation reduces fatigue in patients with   | Early Exercise                | To reduce fatigue patients should be recommended to initiate early exercise programs (Quist et al., 2018).  |

|   |  |                               |  |
|---|--|-------------------------------|--|
|   | operable lung cancer: A randomized trial   |                               |  |
| 4 | Effect of progressive muscle relaxation on sleep quality and fatigue among post valvular heart surgery patients                                | Progressive Muscle Relaxation | Experimental group was provided with PMR program preoperatively. Statistically significant reduction in fatigue, sleep quality improvement at 6 week ( $p < 0.05$ ) (Lakshmanan, 2021).  |
| 5 | Effect of Progressive Muscle Relaxation on Pain and Fatigue among Post Cardiac Surgery Patients  | Progressive Muscle Relaxation | A significant reduction of fatigue scores in the study group as compared to the control group one day postintervention ( $p = 0.0001$ ) as well as five days post-intervention after surgery ( $p = 0.0001$ ) Progressive muscle relaxation technique had a positive effect in reducing postoperative pain and fatigue among patients after cardiac surgery (Mohammed et al., 2020). |
| 6 | Progressive muscle relaxation technique effectiveness on pain and fatigue among post mastectomy women: A quasi-experimental study              | Progressive Muscle Relaxation | There were highly statistically significant differences regarding the scores of pain and fatigue in the intervention group as compared to the control group ( $P = < 0.05$ ). Conclusion: progressive muscle relaxation technique was effective in reducing pain and fatigue levels among post-mastectomy women (Gunes et al., 2024).  |
| 7 | Effects of progressive muscle relaxation exercises on the vital signs and fatigue in kidney transplant patients: a randomized controlled trial | Progressive Muscle Relaxation | PMR exercises were found to be an effective nursing intervention in regulating vital signs and reducing fatigue in renal transplant patients (Uzun Yağız & Avcı Işık, 2024).   |
| 8 | Effect of Benson Muscle Relaxation Technique on Incisional Pain, Fatigue, and Anxiety Levels among Patients Post Abdominal Surgery             | Benson Muscle Relaxation      | Benson Muscle Relaxation Technique was found to be useful in reducing incisional pain, fatigue, and anxiety levels among patients post abdominal surgery (Zidan et al., 2022).   |
| 9 | Effects of Progressive Relaxation Exercises on Vital Signs and Fatigue in Liver Transplant Patients: A Randomized Controlled Trial             | Progressive Muscle Relaxation | fatigue severity mean scores were found to be lower and oxygen saturation level was higher than those of the control group (Kömürkara & Cengiz, 2022).   |

Table 2 shows that progressive muscle relaxation (PMR) is the most common intervention (six articles), followed by reflexology, early exercise and

Benson relaxation with one article each. Each article states that the intervention can manage postoperative fatigue.

PMR is a muscle relaxation technique based on the principle that muscle tension is a physiological response of the human body. Jacobsen was developed this technique in 1938, where the mind and body are relieved from all tension and anxiety (Liu et al., 2020). PMR can increase the body's resistance to stress and overcome fatigue by stimulating the release of endorphins, enkephalins, and hydroxytryptamine. PMR also suppresses the production of cortisol, interleukin-6, and tumor necrosis factor- $\alpha$ . By reducing the excitability of the sympathetic nerve and inhibiting neuroendocrine activities, thus, this technique will keep the body relaxed, lower energy requirements, and increase the amount of strategic energy reserves of the body (Wang et al., 2024). PMR is one of the options in managing fatigue because the technique is easy, simple, does not require special equipment, and is inexpensive.

Reflexology is one of the complementary therapies by stimulating certain parts of the body. Arms, legs, and ears are parts of the body that are often stimulated with pressure in the Reflexology procedure. This technique is usually performed by trained and experienced people. Thus, this technique is limited to anyone. The technique follows maps of the body which are said to represent every physical area of the body via 'reflexes' on the feet, which reflect from the distal

phalanx of the great toe (the head) to the calcaneum (pelvis) (Whatley et al., 2022).

Reflexology stimulates the areas that represent reflexes. Pressure on this area will increase blood circulation, remove toxins, and release energy that is blocked in the area where the pressure is applied (Uğuryol & Dönmez, 2022). This principle is the rationale for using reflexology in managing post-operative fatigue.

The Benson method of relaxation represents one of the therapies associated with spiritual components. By acting on the parasympathetic nerve system, the Benson relaxation technique helps people manage their emotional and physiological stress reaction. In order to minimize the body's oxygen consumption, Benson's relaxation technique suppresses the activity of the sympathetic nerves. This causes the muscles to relax, resulting in a feeling of calm and satisfaction. By inhibiting the parasympathetic nervous system, relaxation helps patients feel more at ease, which helps them sleep better, feel less anxious, and manage their fatigue (Krismiadi et al., 2023).

Based on searches, the next strategy for managing fatigue is early exercise. Early mobilization may lower the risk of lung infection and thrombosis, improve gastrointestinal motility, shorten the period of anal flatus in patients, and hasten organism recovery. The concept of quick

rehabilitation surgery has led to an increase in the use of early mobilization advocacy as a beneficial intervention. In order to guide early bed activity, an effective early activity guidance method should be based on the patient's actual situation. Measuring the appropriate amount of early mobilization based on self-fatigue encompasses the unique characteristics of each patient and tends to be a more efficacious approach than merely measuring the time and distance of early bed activity for patients (Du et al., 2022).

Every intervention carried out has similarities with the mechanism of increasing the amount of energy reserves and reducing the body's energy needs. Lowering energy requirements by relaxing and raising energy by enhancing oxygenation balance. The investigation's findings demonstrate that post-operative fatigue can be effectively managed by the implemented therapies.

## CONCLUSION

Progressive muscle relaxation techniques, reflexology, early exercise and Benson relaxation are non-pharmacological interventions that have the potential to be used as part of the management of postoperative fatigue.

Recommendation nurses are expected to consider the results of this study when developing strategies for managing

postoperative fatigue in order to accelerate recovery and improve postoperative quality of life

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