An Idea Health Journal
ISSN (Online) 2797-0604
Volume 5, Issue 03, 2025

The Effect of Progressive Muscle Relaxation on Fatigue Levels in Hemodialysis Patients: A Case Report

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A R T I C L E I N F O

Article History:
Received :16-05-2025
Revised :19-08-2025
Accepted :24-08-2025

Keywords :
Chronic Kidney Failure, Fatigue**,** Hemodialysis**,** Progressive muscle relaxation.

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A B S T R A C T

Introduction: Chronic kidney disease (CKD) is a disease development from acute kidney failure that is progressive and slow which usually lasts for a long time, causing the kidneys to lose their ability to maintain the composition and amount of fluid in a normal state. Hemodialysis is a therapy that can improve the condition of patients with chronic kidney failure, but on the other hand this treatment method also makes patients have to face various problems, one of which is fatigue. The purpose of this study was to determine the effect of Progressive muscle relaxation on the level of fatigue in patients undergoing hemodialysis. The method used in this intervention study was a case study with a quantitative descriptive approach by evaluating the implementation of the Progressive muscle relaxation intervention. The instrument for measuring the level of fatigue used the FACIT-fatigue scale questionnaire. The results of this study showed that in the initial assessment the patient experienced severe fatigue with a score of 11 and after being given Progressive muscle relaxation intervention, the patient's fatigue score became 24, which is moderate fatigue. From the results of this study it can be concluded that there is an effect of giving Progressive muscle relaxation on reducing the level of fatigue in patients undergoing hemodialysis.

INTRODUCTION

Renal failure is a condition characterized by a sudden decline in kidney function, in which the kidneys are unable to eliminate metabolic waste products or perform their regular functions (1). Chronic kidney disease (CKD) is a progressive and slow development of renal failure that usually occurs over a long period, ultimately leading to the kidneys' inability to maintain normal fluid composition and balance (2). Several risk factors for CKD include age, history of hypertension, family history of chronic kidney failure, history of diabetes, smoking habits, and alcohol consumption (3).

Management of patients with chronic kidney disease can be carried out through dialysis therapy or kidney transplantation. Hemodialysis (HD) is a process that utilizes an HD machine and its accessories, in which the diffusion of solute particles and water occurs passively from the blood into the dialysate compartment through a semipermeable membrane in the dialyzer. The purpose of hemodialysis therapy is to remove toxic nitrogenous substances from the blood and to eliminate excess fluid from the body (4). Hemodialysis is an effective therapy to improve the condition of patients with chronic kidney disease; however, it also brings various physical, psychological, and social challenges. Common complaints include fatigue, cramps, pain, sleep disturbances, dyspnea, pruritus, depression, nausea, vomiting, and constipation, all of which negatively impact patients' daily activities and quality of life (5).

The most common symptom experienced by patients with chronic kidney disease undergoing hemodialysis is fatigue. Fatigue occurs when a person feels weak and lacks the energy to perform daily activities. Subjective symptoms often observed in patients include tiredness, lack of energy, and weakness (6). Negative consequences of both the disease and hemodialysis therapy contribute to multiple problems over time, with fatigue reported in 60–97% of dialysis patients (7). Fatigue in hemodialysis patients is frequently associated with low hemoglobin levels, caused by a reduced number of red blood cells responsible for carrying oxygen to body tissues, leading to decreased oxygen supply (8).

Fatigue experienced by hemodialysis patients can result in reduced physical function, limited ability to perform daily activities, poorer quality of life, and decreased survival rates (9). Non-pharmacological therapies play an important role in reducing patients' fatigue levels, one of which is relaxation techniques. Relaxation is categorized as a mind-body therapy that influences both sympathetic and parasympathetic nervous system

responses, thereby providing benefits for self-regulation (10). There are various relaxation techniques, including progressive muscle relaxation, relaxation breathing exercises, attention-focusing exercises, and behavioral relaxation training (3). Progressive Muscle Relaxation (PMR) is a simple relaxation method designed to stretch and loosen body muscles. This technique can be performed either sitting or lying down and is applicable in various settings (4). PMR has been shown to provide positive effects, as indicated by a reduction in fatigue levels from severe and moderate categories to moderate and mild after therapy implementation (11).

Based on the above description, patients undergoing hemodialysis often experience fatigue, which may affect their quality of life. The aim of this study was to examine the effect of Progressive Muscle Relaxation on fatigue levels in patients undergoing hemodialysis. Therefore, the researchers sought to evaluate the impact of applying the non-pharmacological intervention of Progressive Muscle Relaxation on fatigue levels in hemodialysis patients at Tidar Regional General Hospital, Magelang City (Indonesia).

METHODS

The method used in this interventional study was a case report with a descriptive quantitative approach. The study was conducted in the Hemodialysis Unit of Tidar Regional General Hospital, Magelang City, from May 3 to May 10, 2025. The participant in this study was one patient with a medical diagnosis of chronic kidney disease (CKD). The inclusion criteria were: patients with chronic kidney disease undergoing routine hemodialysis, experiencing fatigue, able to communicate well, and willing to participate in the study. Progressive Muscle Relaxation (PMR) was performed for 10–15 minutes, at least once daily, by stretching several muscle groups combined with breathing regulation. This relaxation technique could be carried out in either a sitting or lying position.

The study was implemented in three stages: assessment, intervention, and documentation. The first stage involved an assessment to identify the complaints experienced by the patient during the hemodialysis process.The second stage involved providing the intervention to the patient after hemodialysis was completed. Before PMR was administered, the patient was asked to complete the FACIT-Fatigue questionnaire to measure fatigue levels at that time. Following the hemodialysis session, the researcher administered the PMR intervention. After the intervention, the patient and family were given the opportunity to ask questions and practice the technique. The patient was then instructed to continue practicing the technique regularly at home and was monitored through WhatsApp for seven days. On the seventh day, the patient was asked to complete the FACIT-Fatigue questionnaire again as an evaluation of the intervention.The third stage was documentation, during which the researcher evaluated and collected data related to changes in the patient's fatigue level using the FACIT-Fatigue questionnaire scores before and after the PMR intervention. The scoring range for the FACIT-Fatigue questionnaire is as follows: ≤17 indicates severe fatigue, 18–30 indicates moderate fatigue, and ≥31 indicates mild fatigue.

RESULT AND DISCUSSION

RESULT

The participant in this study was Mrs. I, a 44-year-old housewife residing in Magelang. The patient had been undergoing hemodialysis for approximately four years, with routine sessions twice weekly on Wednesdays and Saturdays. During her routine hemodialysis session on Wednesday, April 30, 2025, an initial assessment was conducted. The main complaints reported by the patient were frequent fatigue, weakness, and easy exhaustion during daily activities. The patient stated that these complaints might be related to her illness and the ongoing hemodialysis treatment.The FACIT-Fatigue questionnaire completed prior to the intervention indicated severe fatigue, with a score of 11 over the past seven days. After receiving the Progressive Muscle Relaxation (PMR) intervention for seven consecutive days, the patient returned for hemodialysis on May 10, 2025. She was asked to complete the FACIT-Fatigue questionnaire again to evaluate her fatigue level following the intervention. The post-intervention result showed a score of 24, which indicated a moderate level of fatigue.

Table 1. Results of Fatigue Level Assessment Using the FACIT-Fatigue Questionnaire

Before intervention	After Intervensi
11	24

The patient still reported experiencing mild fatigue but stated that her body felt fresher, enabling her to engage in more daily activities. Daily monitoring showed that the patient practiced Progressive Muscle Relaxation at least once a day for 15 minutes. The researcher then advised the patient to perform the intervention more regularly to achieve more effective outcomes. Based on this case, there was a change in the FACIT-Fatigue score after the intervention, demonstrating that Progressive Muscle Relaxation was effective in reducing fatigue levels in Mrs. I, a patient undergoing hemodialysis.

DISCUSSION

Based on the results of the assessment using the FACIT-Fatigue questionnaire, Mrs. I initially presented with severe fatigue. Fatigue frequently experienced by hemodialysis patients can be caused by several factors. In this case, fatigue may have been related to anemia experienced by the patient. A significant relationship has been reported between hemoglobin levels and fatigue, as indicated by a p-value <0.05, demonstrating that hemoglobin is associated with fatigue levels in chronic kidney disease patients undergoing hemodialysis (12). Anemia, which is common in patients with chronic kidney disease (CKD), is caused by impaired production of the hormone erythropoietin, which stimulates red blood cell formation. Low hemoglobin levels result in symptoms such as decreased energy and physical fatigue (12).

The duration of hemodialysis is also a contributing factor to patient fatigue, which tends to increase over time as the severity of CKD progresses (13). Patients with chronic kidney disease who have been undergoing hemodialysis for more than 6–8 months generally experience severe fatigue, which is associated with uremic neuropathy syndrome (14). Furthermore, patients who have undergone hemodialysis for more than two years are at a higher risk of malnutrition. This risk arises because the dialysis process can lead to nutrient loss through dialysate fluid and accelerate catabolic processes. Prolonged and continuous hemodialysis sessions can also deplete patients' time and energy, ultimately affecting lifestyle, causing boredom, and increasing psychological stress, all of which contribute to fatigue (15).The application of Progressive Muscle Relaxation (PMR) in this case resulted in a change in fatigue scores, with Mrs. I's FACIT-Fatigue score improving from 11 (severe fatigue) to 24 (moderate fatigue) after seven days of intervention. This finding is consistent with previous studies reporting that the application of progressive muscle relaxation and deep breathing relaxation techniques increased fatigue scores in both study subjects. In the first subject, the FACIT score increased from 28, indicating fatigue, to 43, indicating no fatigue. In the second subject, the score improved from 24 (fatigue) to 41 (no fatigue) after three days of intervention (4).

The researchers assumed that the implementation of PMR contributed to reducing fatigue levels in hemodialysis patients because this relaxation technique provides physiological effects, such as reduced muscle tension, improved blood circulation, and optimized oxygen delivery to body tissues, which indirectly enhance cellular metabolism and reduce fatigue. In addition, PMR provides psychological benefits, including a sense of calm, decreased anxiety, and improved sleep quality, which enable patients to feel more refreshed and energized. Therefore, it can be assumed that the more consistently patients practice PMR as a complementary therapy during hemodialysis, the greater the likelihood of a significant reduction in fatigue levels.Progressive Muscle Relaxation has been shown to reduce fatigue in hemodialysis patients. PMR is a technique involving the sequential tensing and relaxing of muscle groups from head to toe, which provides a calming effect on the mind. This method helps reduce the impact of chronic stress on the body and directs an individual's focus to skeletal muscle groups (4). Progressive muscle relaxation is a relaxation method that focuses on specific muscle activity combined with breathing techniques. Proper breathing patterns can improve oxygen supply to the brain, allowing the body to become more relaxed and calm. The overall effect is the emergence of a sense of tranquility that can help alleviate fatigue (9).

CONCLUSION

Based on the results of implementing Progressive Muscle Relaxation (PMR) in a patient undergoing hemodialysis, it can be concluded that PMR had an effect on reducing fatigue levels in hemodialysis patients. From this case study, it is expected that hospitals will promote the use of Progressive Muscle Relaxation among patients undergoing hemodialysis as an effort to reduce fatigue. In addition, nurses are encouraged to integrate PMR into nursing care as a complementary method to help decrease fatigue in patients receiving hemodialysis treatment.

ACKNOWLEDGEMENTS

The authors would like to thank Tidar Regional General Hospital, Magelang City, the academic supervisors, the clinical mentors, the research respondent, and all parties who contributed to the successful completion of this study.

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