THE IMPLEMENTATION OF PROGRESSIVE MUSCLE RELAXATION ON FATIGUE IN PATIENTS WITH DIABETES MELLITUS

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Abstract
In patients with diabetes mellitus, complaints of fatigue often occur due to uncontrolled blood glucose levels, impaired energy metabolism, and physical and psychological stress. Hyperglycemia causes the body to have difficulty utilizing glucose as an energy source, resulting in weakness, tiredness, sleep disturbances, and decreased motivation to carry out daily activities. The application of progressive muscle relaxation is a non-pharmacological intervention aimed at reducing muscle tension and promoting physical relaxation. This study used a descriptive case study method with a multi-case design and applied the nursing care process approach in patients with type 2 diabetes mellitus. The intervention was implemented for three consecutive days in two diabetic patients at Puskesmas Simpang Tiga Pekanbaru. The effectiveness of the intervention was evaluated before and after the implementation of progressive muscle relaxation using the Fatigue Assessment Scale (FAS). The results showed that after three days of intervention, Patient 1 experienced a reduction in fatigue level to a score of 20 (no fatigue/normal) with a blood glucose level of 126 mg/dl, while Patient 2 had a fatigue score of 22 (mild to moderate) with a blood glucose level of 187 mg/dl. Based on these findings, it is recommended that diabetic patients practice progressive muscle relaxation regularly to reduce fatigue and improve their quality of life. Nurses are expected to integrate progressive muscle relaxation as a non-pharmacological intervention in nursing care practice for patients experiencing fatigue.
Keyword: 1; Diabetes Melitus 2; Progressive Muscle Relaxation 3; Nursing Care 4

INTRODUCTION

Diabetes mellitus is a metabolic disease characterized by an increase in blood glucose levels due to a disorder of the insulin hormone, which functions to maintain the body's homeostasis by lowering blood sugar levels (Tribakti, 2025). This disease is chronic in nature and occurs when the pancreas is unable to produce sufficient amounts of insulin or when the body cannot effectively use the insulin it produces (Ricky & Wulandari, 2024). In general, diabetes mellitus is classified into two types, namely type 1 and type 2, with type 2 diabetes mellitus being the most prevalent form worldwide (Astutisari et al., 2022).

The International Diabetes Federation (IDF) stated that the global prevalence of diabetes mellitus has increased significantly. Data from the IDF show that the number of people with diabetes worldwide reached 537 million in 2021. This figure is projected to continue rising, reaching 643 million in 2030 and 783 million in 2045. According to the IDF, Indonesia ranks fifth among countries with the highest number of diabetes cases, with 19.5 million people affected in 2021, and this number is expected to increase to 28.6 million by 2045 (Kemenkes, 2023).

The increasing prevalence of diabetes mellitus (DM) cases in Indonesia has also led to a rise in DM prevalence in Pekanbaru City. According to data from the Pekanbaru City Health Office (2021), DM ranks second after hypertension among the ten most common non-

communicable diseases in community health centers (Puskesmas) across Pekanbaru, with a total of 18,245 reported cases. Simpang Tiga Community Health Center (Puskesmas Simpang Tiga) recorded the highest number of type 2 DM cases among the 21 community health centers in Pekanbaru, with 1,358 cases, which increased to 1,526 cases in 2024 (Saraswati et al., 2025). Chronic hyperglycemia can cause symptoms such as polyuria, polydipsia, polyphagia, weight loss, visual disturbances, and fatigue (Widiasari et al., 2021). Elevated blood glucose levels can affect the physical condition of patients with type 2 diabetes mellitus, one of which is susceptibility to fatigue due to the body cells' inability to utilize glucose as a result of insulin resistance (Kusyari & Rahmat, 2023). Chronic hyperglycemia leads to disturbances in cellular energy metabolism, thereby reducing the efficiency of ATP production needed by muscles and nerve tissues, resulting in fatigue and muscle weakness (Sholahudin et al., 2025).

Diabetes mellitus is often associated with fatigue. Fatigue is defined as a persistent and debilitating feeling of tiredness that affects an individual's ability to perform daily activities (Ricky & Wulandari, 2024). A study by Kaur et al. (2020) found that 61% of diabetes mellitus patients experienced fatigue. According to research by Ricky and Wulandari (2024), the overall fatigue level among diabetic patients was categorized as severe, with total scores >31 observed in 27 participants (90%), followed by mild fatigue with total scores <30 in 10 participants (10%).

This fatigue not only affects the physical condition but also reduces patients' quality of life and glycemic control. When left unmanaged, it can trigger increased blood pressure, metabolic disturbances, and other complications. Furthermore, fatigue worsens treatment adherence and makes it difficult for patients to carry out daily activities (Hartono & Ediyono, 2024). Fatigue in diabetic patients is often overlooked, even though managing fatigue can significantly improve their quality of life. One behavioral management technique that can be used to address fatigue is **progressive muscle relaxation** (Antoni & Simamora, 2020).

Progressive muscle relaxation is a relaxation technique that involves sequentially tensing and relaxing specific muscle groups, including the toes, feet, legs, calves, thighs, abdominal muscles, back, chest, hands, biceps or triceps, shoulders, neck, and facial muscles. During progressive muscle relaxation, patients are instructed to take a deep breath through the nose and exhale slowly through the mouth, as if whistling (Suryani et al., 2022). This technique has been shown to help manage hypertension, headaches, and insomnia (sleep disturbances), reduce anxiety and stress-related disorders, and improve work performance, social and physical skills, reduce fatigue, and enhance mental activity (Putri & Fitri, 2025)

RESEARCH METHODS

This study used a descriptive case study method with a multi-case design and applied the nursing care process approach in patients with type 2 diabetes mellitus. The intervention was implemented for three consecutive days in two diabetic patients at Puskesmas Simpang Tiga Pekanbaru. The effectiveness of the intervention was evaluated before and after the implementation of progressive muscle relaxation using the Fatigue Assessment Scale (FAS).

RESEARCH RESULTS

The results obtained from two patients with type 2 diabetes mellitus who had the nursing problem of fatigue showed improvement after the implementation of progressive muscle relaxation. For **Patient I**, on the first day of intervention, which lasted approximately 15 minutes, there was a decrease in the fatigue scale from 34 (mild to moderate) and random blood glucose (RBG) level of 256 mg/dl before the intervention, to 27 (mild to moderate) and RBG

of 212 mg/dl after the intervention. On the second day, the fatigue scale decreased to 24 **(**mild to moderate) with an RBG of 171 mg/dl, and on the third day, it further decreased to 20 (no fatigue/normal**)** with an RBG of 126 mg/dl. The fatigue level was measured using the Fatigue Assessment Scale (FAS**)** questionnaire.

Based on the results of implementation in **Patient II**, before the progressive muscle relaxation intervention, the fatigue scale on the first day was 36 (severe**)** with an RBG of 285 mg/dl**.** After performing progressive muscle relaxation, the fatigue scale decreased to 30 (mild to moderate) with an RBG of 253 mg/dl. On the second day, the fatigue scale was 26 (mild to moderate) with an RBG of 243 mg/dl**,** while on the third day it decreased further to 22 (mild to moderate) with an RBG of 187 mg/dl. The fatigue level was measured using the **F**atigue Assessment Scale (FAS) questionnaire.

DISCUSSION

Based on the results of implementing progressive muscle relaxation in Patient 1 over three consecutive days, a decrease in fatigue levels was observed. The evaluation results are consistent with the findings of Sulistyowati (2021)**,** who reported a reduction in fatigue symptoms among the intervention group before and after progressive muscle relaxation exercises (previously, the majority of respondents in the intervention group experienced severe fatigue, but after the intervention, the average fatigue level decreased to mild fatigue).
Therefore, progressive muscle relaxation can be considered a safe and easy non-pharmacological intervention to help reduce signs and symptoms of fatigue in patients with diabetes mellitus.

Progressive muscle relaxation is a non-pharmacological intervention aimed at reducing muscle tension and promoting relaxation throughout the body. This technique involves systematically tensing and relaxing specific muscle groups from the feet to the head, which helps lower sympathetic nervous system activity, improve blood circulation, and enhance tissue oxygenation.

In patients with diabetes mellitus, complaints of fatigue frequently occur due to uncontrolled blood glucose levels, impaired energy metabolism, and physical as well as psychological stress. Hyperglycemia makes it difficult for the body to utilize glucose as an energy source, leading to feelings of weakness, tiredness, sleep disturbances, and loss of motivation to perform daily activities. Moreover, chronic stress and sustained muscle tension further exacerbate the feeling of fatigue.

By applying the progressive muscle relaxation technique, muscle tension can be reduced, blood flow throughout the body improves, and stress hormone (cortisol) levels decrease. These physiological changes promote a calmer state of body and mind, thereby improving sleep quality and restoring energy balance. Such physiological and psychological effects contribute to reducing fatigue levels in diabetic patients.
In conclusion, there is a clear cause-and-effect relationship between the implementation of progressive muscle relaxation and the reduction of fatigue in patients with diabetes mellitus. Progressive muscle relaxation has a positive impact on fatigue levels, and the more regularly and consistently it is practiced, the greater the likelihood of decreased fatigue and improved quality of life among patients with diabetes mellitus**.**

CONCLUSION

After implementing progressive muscle relaxation in patients with type 2 diabetes mellitus who experienced fatigue at Puskesmas Simpang Tiga Pekanbaru, the following conclusions were obtained:

1. During the assessment of Patients I and II, it was found that both patients exhibited several signs and symptoms indicating fatigue, as evidenced by the results of the Fatigue Assessment Scale (FAS) questionnaire.
2. Based on the data analysis conducted by the researcher, the nursing diagnoses established for both patients were:
   - The first diagnosis: Unstable blood glucose level related to insulin resistance.
   - The second diagnosis: Fatigue related to chronic disease.
3. The nursing interventions provided to the patients were based on SIKI (Standar Intervensi Keperawatan Indonesia), which included hyperglycemia management and energy management, with the implementation of evidence-based nursing (EBN) through progressive muscle relaxation to reduce fatigue in patients with type 2 diabetes mellitus.
4. The implementation of progressive muscle relaxation was carried out for three consecutive days, from Monday, July 7, 2025, to Wednesday, July 9, 2025, with each session lasting approximately 15 minutes. Fatigue levels were measured using the Fatigue Assessment Scale (FAS) questionnaire, and random blood glucose (RBG) levels were also monitored.
5. The evaluation results showed a decrease in fatigue levels in both patients as well as a reduction in random blood glucose levels after the implementation of progressive muscle relaxation in patients with type 2 diabetes mellitus. to address nursing issues related to fatigue in cancer patients undergoing chemotherapy.

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