THE APPLICATION OF FOOT EXERCISE TO ENHANCE PERIPHERAL PERFUSION AMONG DIABETES MELLITUS PATIENTS IN THE KENANGA I ROOM OF RSUD ARIFIN ACHMAD, RIAU PROVINCE

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Abstract

Diabetes Mellitus is a chronic metabolic disorder that can lead to peripheral perfusion complications due to damage to blood vessels and nerves. Peripheral perfusion disorders in patients with diabetes mellitus can cause decreased blood flow to the extremities, pain, tingling, slow-healing wounds, and even amputation. One non-pharmacological intervention to address peripheral perfusion is diabetic foot exercises. This study aims to determine the effect of foot exercises on improving peripheral perfusion in patients with diabetes mellitus in the Kenanga I Room Arifin Achmad, Riau Province. The method used is a case study with two patients with diabetes mellitus with peripheral perfusion disorders who were given foot exercises for six days with a duration of 15 minutes. Blood pressure measurements were taken before and after the intervention. The results showed a decrease in systolic and diastolic blood pressure and improvements in signs of peripheral perfusion such as peripheral pulses, skin turgor, skin color, and Ankle Brachial Index (ABI) values after diabetic foot exercises. The conclusion of this study is to help improve peripheral perfusion, provide a simple, inexpensive, and safe alternative therapy, increase patient knowledge about the importance of foot care and prevent microvascular complications.

Keyword: Diabetes mellitus, peripheral perfusion, leg exercise

INTRODUCTION

The rapid development of modern lifestyles and unbalanced dietary patterns can lead to various complications affecting multiple organs, one of which is **Diabetes Mellitus (DM)**. Diabetes is a metabolic disorder characterized by elevated blood glucose levels (**hyperglycemia**) due to impaired insulin production or reduced insulin effectiveness, resulting in disturbances in the metabolism of carbohydrates, fats, and proteins (Rahayu, 2020). This disease is widely known for its various complications, one of which is **peripheral perfusion disorder**, including **macrovascular** and **microvascular** complications (Yuhelma et al., 2022).

According to the Indonesian Health Survey (2023), the number of diabetes cases reached **20,925,** with one of the highest prevalences found in **Riau Province,** accounting for **3,740 cases**. The management of diabetes mellitus generally involves both **pharmacological** and **non-pharmacological** therapies. Pharmacological therapy includes the administration of medications to control blood glucose levels, such as **metformin, sulfonylureas, meglitinides, and novorapid**, while non-pharmacological therapy includes **lifestyle modifications** such as dietary regulation, stress management, regular physical activity, acupressure, diabetic foot exercises, diabetic foot spa, resistance training, and **Buerger Allen exercises** (Lase et al., 2024). One of the most commonly used non-pharmacological therapies to overcome **peripheral perfusion disorders is diabetic foot exercise**. This form of physical exercise is performed by diabetic patients with the aim of preventing foot ulcers and improving blood circulation, optimizing nutrient delivery, strengthening foot muscles, and reducing joint stiffness, thereby enhancing mobility and preventing further complications (Hoda et al., 2021). Research conducted by Rahayu (2020) showed that diabetic foot exercise is an effective physical activity aimed at preventing foot ulcers and improving blood circulation in the lower extremities. A preliminary study conducted in the **Kenanga I Ward of Arifin Achmad Regional Hospital, Riau Province,** revealed several diabetic patients experiencing **peripheral perfusion disorders.** Based on these findings, the author is interested in conducting a study entitled **"The Application of Foot Exercise to Improve Peripheral Perfusion**

among Diabetes Mellitus Patients in Kenanga I Ward, Arifin Achmad Hospital, Riau Province." This study aims to determine the effect of diabetic foot exercise on improving peripheral perfusion in patients with diabetes mellitus.

RESEARCH METHODS

This study employed a case study design by implementing foot exercise interventions for diabetic patients at risk of peripheral perfusion impairment. The intervention was conducted over a period of six days involving two diabetic patients who were hospitalized in the Kenanga I Room Arifin Achmad, Riau Province, Riau Province. The diabetic foot exercise was performed for 10 minutes using the Ankle Brachial Index (ABI) measurement tool, specifically a sphygmomanometer, to assess blood pressure before and after the intervention. Data were collected using blood pressure observation sheets that recorded changes in systolic and diastolic pressure. The indicators of successful intervention in improving peripheral perfusion were based on the Indonesian Nursing Outcome Standards (SLKI) – Peripheral Perfusion (L.02011), which include improvements in systolic and diastolic blood pressure, peripheral pulse, skin turgor, skin color, and Ankle Brachial Index (ABI) values.

RESEARCH RESULTS

Based on the evaluation results of two patients with diabetes mellitus who experienced ineffective peripheral perfusion, it was found that there was an improvement in peripheral perfusion after the implementation of diabetic foot exercises for six consecutive days.
In the first patient, on Monday, August 2025, a male diagnosed with Type 2 Diabetes Mellitus and severe anemia, the blood pressure before the foot exercise on the first day was 160/110 mmHg, which decreased to 150/90 mmHg after the intervention. On the second day, blood pressure of 170/100 mmHg decreased to 130/80 mmHg after the intervention. On the third day, blood pressure of 140/90 mmHg decreased to 120/85 mmHg after the intervention. On the fourth day, blood pressure of 130/80 mmHg decreased to 110/95 mmHg after the intervention. On the fifth day, blood pressure before the exercise was 130/85 mmHg, which decreased to 115/80 mmHg after the intervention. On the sixth day, blood pressure before the exercise was 120/80 mmHg, which decreased to 110/75 mmHg after the intervention.

In the second patient, on Monday, August 2025, a male diagnosed with Type 2 Diabetes Mellitus and Chronic Kidney Disease (CKD) on Hemodialysis, the blood pressure before the foot exercise on the first day was 150/100 mmHg, which decreased to 140/90 mmHg after the intervention. On the second day, blood pressure before the foot exercise was 145/95 mmHg, which decreased to 130/85 mmHg after the intervention. On the third day, blood pressure before the exercise was 140/90 mmHg, which decreased to 125/80 mmHg after the intervention. On the fourth day, blood pressure before the exercise was 135/85 mmHg, which decreased to 120/80 mmHg after the intervention. On the fifth day, blood pressure before the exercise was 130/85 mmHg, which decreased to 115/75 mmHg after the intervention. On the sixth day, blood pressure before the exercise was 120/80 mmHg, which decreased to 110/70 mmHg after the intervention.

DISCUSSION

Based on the study conducted by Rahayu (2020), the implementation of foot exercises as a nursing intervention helps to overcome ineffective peripheral perfusion in patients with diabetes mellitus. Diabetic foot exercises improve peripheral perfusion indicators by reducing systolic and diastolic blood pressure, enhancing peripheral pulse, improving skin turgor and color, and increasing the Ankle Brachial Index (ABI) values. These findings are consistent with previous studies that investigated the effectiveness of foot exercises in improving peripheral perfusion among patients with diabetes mellitus. The results of this study showed that performing foot exercises for six consecutive days significantly improved peripheral perfusion, as indicated by better systolic and diastolic blood pressure, peripheral pulse, skin turgor, skin color, and ABI values. Therefore, diabetic foot exercises can serve as a safe and effective non-pharmacological intervention to manage peripheral perfusion problems in patients with diabetes mellitus.

CONCLUSION

The application of foot exercises for six consecutive days in patients with diabetes mellitus has been proven effective in improving peripheral perfusion disorders. The results of the study showed an improvement in peripheral perfusion, as indicated by better systolic and diastolic blood pressure, peripheral pulse, skin turgor, skin color, and Ankle Brachial Index (ABI) values. In addition, the patients' blood pressure showed a gradual and stable decrease from day to day. Foot exercises can serve as a simple, non-pharmacological, and effective nursing intervention to improve peripheral blood circulation and prevent further complications in patients with diabetes mellitus.

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