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APPLICATION OF FOOT REFLEXOLOGY MASSAGE TO REDUCE BLOOD GLUCOSE LEVELS IN DIABETES MELLITUS

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ABSTRACT

***Background**: Diabetes mellitus (DM) is a chronic disease characterized by elevated blood glucose levels due to impaired insulin production or function. Unstable blood glucose levels in DM patients can lead to various serious complications. One non-pharmacological therapy that may help reduce blood glucose levels is foot reflexology, which stimulates reflex points associated with pancreatic function. Based on medical records from Alamanda 1 Ward RSUD Sleman, there were 118 patients diagnosed with DM between January and August 2025. **Objective**: To describe the implementation of foot reflexology therapy in lowering blood glucose levels in DM patients at Alamanda 1 Ward RSUD Sleman. **Method**: A descriptive case study on one DM patient. Foot reflexology therapy was applied for 20 minutes, twice daily, over two consecutive days. Data were collected through pre- and post-therapy blood glucose measurements. **Results**: After two days of therapy, the patient's blood glucose level decreased from 374 mg/dL to 222 mg/dL. **Conclusion**: Foot reflexology therapy may help reduce blood glucose levels in DM patients. **Suggestion**: This therapy can be considered as an alternative non-pharmacological approach in the management of blood glucose levels in DM patients.*

INTRODUCTION

According to Haskas et al. (2022), DM, or what is commonly referred to as diabetes mellitus, is a chronic disease that causes premature death worldwide. This condition occurs due to metabolic disorders in the body characterized by insufficient insulin production by beta cells in the pancreas, muscles, intestines, and fat cells, or the failure of body cells to respond to insulin, resulting in elevated blood glucose levels, or hyperglycemia.

According to 2021 data from the International Diabetes Federation (IDF), approximately 537 million adults live with diabetes, resulting in 6.7 million deaths annually (IDF, 2021). Indonesia ranks fifth in the world with 19.5 million sufferers, and this number is predicted to increase to 28.6 million by 2045 (IDF, 2021). In the Special Region of Yogyakarta, the number of DM sufferers in 2021 was recorded at 83,568, with Sleman Regency having the highest number, with 24,690 cases (Pranata & Sari, 2021). At Sleman Regional Hospital, specifically in Alamanda Ward 1, 118 patients were admitted with a diagnosis of diabetes mellitus between January and August 2025 (Sleman Regional Hospital Medical Records, 2025).

Type 2 diabetes is the most prevalent type, characterized by metabolic disorders due to insulin resistance or inadequate insulin secretion, leading to hyperglycemia. Unstable blood glucose levels in DM patients can increase the risk of acute and chronic complications, such as nephropathy, retinopathy, neuropathy, stroke, and even amputation (Widiasari et al., 2021).

Currently, DM management relies heavily on pharmacological therapies such as insulin or oral antihyperglycemic drugs, but these therapies are associated with long-term side effects and high costs (Triyolanda, 2023). Therefore, alternative non-pharmacological therapies are needed that are safe, easy to implement, and effective, one of which is foot reflexology.

Reflexology massage is a method of stimulating specific nerve points in the feet that are connected to organs, including the pancreas (Mardiana, 2021). This stimulation is transmitted as nerve impulses to the brain, which then influence the pancreas's insulin production, improve receptor sensitivity, and help lower blood glucose levels (Masithoh et al., 2016).

Numerous studies have demonstrated the effectiveness of this therapy, such as a study by Purwanti et al. (2024) that showed a decrease in blood glucose levels from 385 mg/dL to 195 mg/dL, and a study by Isnainy et al. (2021) that showed a decrease from 215 mg/dL to 189 mg/dL after 3 days of therapy. Furthermore, this therapy also improves blood circulation, activates metabolic enzymes such as glucose-6-phosphate, and reduces symptoms of neuropathy (Sunarmi et al., 2022).

Seeing the importance of controlling DM and the great potential of foot reflexology massage as a complementary therapy, this study was conducted to describe the application of foot reflexology massage therapy in reducing blood glucose levels in type 2 diabetes mellitus patients in Alamanda Ward 1, Sleman Regional General Hospital and to describe changes in blood sugar levels before and after therapy for two consecutive days.

RESEARCH METHODS

This research used a descriptive case study design with a quantitative approach. The aim was to describe the application of foot reflexology therapy to lower blood glucose levels in patients with type 2 diabetes mellitus (Purwanti et al., 2024).

The study was conducted in the Alamanda 1 Ward of Sleman Regional Hospital on one patient who met the inclusion criteria: a blood glucose level greater than 200 mg/dL, fully conscious (compos mentis), no wounds or skin disorders on the feet, and a willingness to participate.

The tools and materials used included a glucometer to measure blood glucose levels, glucose strips, alcohol swabs, and a Standard Operating Procedure (SOP) for foot reflexology therapy, developed based on reflexology principles as described by (Mardiana, 2021).

Therapy was performed by applying pressure to the pancreas reflex points located on the inner soles of the right and left feet for 20 minutes per session, twice daily, at 10:00 AM and 4:00 PM, for two consecutive days (Masithoh et al., 2016).

Data were collected through direct observation and measurement of random blood glucose levels (GDS) before and after therapy using a glucometer (Sunarmi et al., 2022). Primary data were collected four times, before and after therapy on the first and second days.

The main variables measured in this study were blood glucose levels, expressed in mg/dL, and the foot reflexology intervention, defined as the act of pressing the pancreas reflex points according to SOPs and applicable reflexology literature.

The data obtained were analyzed descriptively and quantitatively by comparing random blood glucose levels (GDS) before and after therapy and calculating the reduction in blood glucose levels to determine the effect of the intervention. The results are presented in the form of tables and graphs to clarify the picture of changes in blood glucose levels during therapy (Purwanti et al., 2024).

RESULTS AND DISCUSSION

This study was conducted to evaluate the effect of foot reflexology massage therapy on reducing blood glucose levels in patients with type 2 diabetes mellitus. The intervention was conducted over two consecutive days, twice daily (morning and evening), with each session lasting 20 minutes.

On the first day of the morning session, the blood glucose level before the morning therapy session was 374 mg/dL. After 20 minutes of foot reflexology, the glucose level decreased to 353 mg/dL. In the afternoon, the blood glucose level was measured again before the second therapy session, and the result was 344 mg/dL. It decreased to 317 mg/dL after the afternoon therapy session.

On the second day of the morning session, the blood glucose level before the morning therapy session was 296 mg/dL, and after 20 minutes of therapy, it decreased to 258 mg/dL. On the afternoon before the final therapy session, the blood glucose level was recorded at 239 mg/dL, and it decreased again to 222 mg/dL after the reflexology massage. Overall, the patient's blood glucose level decreased from 374 mg/dL to 222 mg/dL over the two days of intervention, a decrease of 152 mg/dL. This decrease was gradual and occurred consistently throughout each therapy session.

These results indicate that foot reflexology massage therapy has a positive effect on reducing blood glucose levels within a short period of time. This significant decrease is thought to be related to

stimulation of pancreatic reflex points, which send nerve impulses to the central nervous system, which then increases pancreatic activity in producing insulin. Furthermore, pressure on specific reflex points can improve blood flow, accelerate glucose metabolism, and increase tissue sensitivity to insulin.

These findings align with research conducted by Selviana et al. (2022), which showed that 20–30 minutes of foot reflexology massage over three days effectively reduced blood sugar levels in diabetic patients. Masithoh et al. (2016) also explained that stimulation of pancreatic reflex points can activate the glucose-6-phosphate enzyme, which plays a role in glucose metabolism and stimulate pancreatic beta cells to increase insulin production. Furthermore, massage of liver reflex points is also believed to aid gluconeogenesis and the conversion of glucose to glycogen, contributing to lower blood sugar levels. Research by Sunarmi et al. (2022) supports these findings, stating that increased blood circulation due to massage helps distribute glucose more effectively throughout the body's tissues.

Thus, the results of this study strengthen the evidence that foot reflexology massage therapy is an effective complementary intervention and is worth implementing in blood glucose management in patients with type 2 diabetes mellitus, especially in the short term.

Table

Table 3.1 GDS Results Before and After Foot Reflexology Massage Therapy

Day	Blood sugar level 15 minutes before therapy	Blood sugar level 30 minutes after therapy	Reduction
Day 1 morning	374 mg/dL	353 mg/dL	21 mg/dL
Day 1 afternoon	344 mg/dL	317 mg/dL	27 mg/dL
Day 2 morning	296 mg/dL	258 mg/dL	38 mg/dL
Day 2 afternoon	239 mg/dL	222 mg/dL	17 mg/dL

Picture

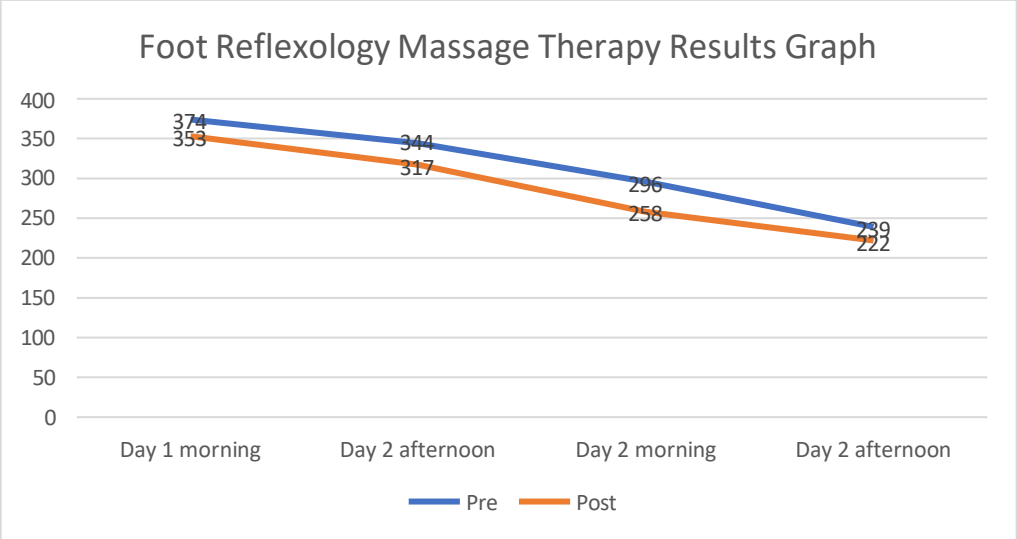

Figure 3.2 Graph of GDS Values Before and After Foot Reflexology Massage Therapy

CONCLUSION

Based on the results of a two-day study on type 2 diabetes mellitus patients in the Alamanda 1 Ward of Sleman Regional General Hospital, it was found that foot reflexology massage therapy can gradually lower blood glucose levels with each therapy session. The patient's blood glucose levels decreased from 374 mg/dL to 222 mg/dL after four sessions, for a total reduction of 152 mg/dL.

This decrease indicates that foot reflexology massage therapy can have a positive effect on controlling blood glucose levels in a relatively short period of time. The mechanism of action of this therapy is thought to be related to stimulation of pancreatic reflex points, which triggers nerve responses and enhances metabolic function, as well as improving blood circulation, which aids glucose distribution to tissues.

Therefore, foot reflexology massage has the potential to be a form of non-pharmacological intervention that can be used as part of holistic care for type 2 diabetes mellitus patients to help maintain stable blood sugar levels.

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