



DESCRIPTION OF THE ADMINISTRATION OF BOILED MORINGA LEAVES TO REDUCE RANDOM BLOOD GLUCOSE LEVELS IN MRS. D WITH TYPE 2 DIABETES MELLITUS IN SIKAMPUH VILLAGE, KROYA DISTRICT, CILACAP REGENCY

GAMBARAN PEMBERIAN REBUSAN DAUN KELOR TERHADAP PENURUNAN KADAR GLUKOSA DARAH SEWAKTU PADA Ny. D DENGAN DIABETES MELITUS TIPE 2 DI DESA SIKAMPUH KECAMATAN KROYA KABUPATEN CILACAP

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Abstract

Diabetes mellitus is a chronic metabolic disorder caused by high levels of physical activity, high sugar consumption, reduced insulin production, and impaired insulin response or other hormones that inhibit insulin action. Based on IDF data, the prevalence of diabetes mellitus in Indonesia in 2024 is estimated to reach 11.3% of the population (approximately 20.4 million people). In addition, the Ministry of Health shows that in 2023, cases of diabetes mellitus will reach 11.7% and are predicted to continue to increase. High blood glucose levels, if left untreated, can cause various complications such as heart disease, stroke, nerve damage, and wound infections that can lead to amputation. One non-pharmacological treatment that can be given is by giving boiled moringa leaves, because moringa leaves contain antioxidants such as flavonoids, vitamins A, C, and E which can lower blood glucose levels. To determine the effect of Moringa leaf decoction on reducing blood glucose levels in diabetes mellitus patients in Sikampung Village, Kroya District, Cilacap Regency. The method used was a qualitative descriptive method with a case study approach. Based on the research results, administering Moringa leaf decoction to blood glucose levels in diabetes mellitus patients for 7 days was proven to be effective in lowering blood glucose levels. Administering Moringa leaf decoction to diabetes mellitus patients for 7 days can lower blood glucose levels.

Keywords : Moringa Leaves, Blood Glucose, Diabetes Mellitu.

Abstrak

Diabetes mellitus merupakan gangguan metabolisme kronis karena tingginya aktifitas fisik, tingginya konsumsi gula, produksi insulin yang berkurang, serta respon insulin dalam tubuh yang terganggu atau hormon lain yang menghambat kerja insulin. Berdasarkan data IDF, prevalensi diabetes melitus di Indonesia tahun 2024 diperkirakan mencapai 11,3% dari populasi (sekitar 20,4 juta jiwa). Selain itu, Kemenkes menunjukkan bahwa tahun 2023 kasus diabetes melitus mencapai 11,7% dan diprediksi akan



terus mengalami kenaikan. Kadar glukosa darah tinggi jika dibiarkan dapat menyebabkan berbagai komplikasi seperti penyakit jantung, stroke, kerusakan saraf, hingga infeksi luka yang bisa berujung pada amputasi. Salah satu penanganan nonfarmakologis yang dapat diberikan yaitu dengan pemberian rebusan daun kelor, karena daun kelor mengandung antioksidan seperti flavanoid, vitamin A, C, E yang dapat menurunkan kadar glukosa darah. mengetahui pengaruh pemberian rebusan daun kelor terhadap penurunan kadar glukosa darah diabetes melitus di Desa Sikampung Kecamatan Kroya Kabupaten Cilacap. metode yang digunakan adalah metode deskriptif kualitatif dengan pendekatan studi kasus. Berdasarkan hasil penelitian, pemberian rebusan daun kelor terhadap kadar glukosa darah pasien diabetes melitus selama 7 hari, terbukti efektif berpengaruh menurunkan kadar glukosa darah. Pemberian rebusan daun kelor ada pasien diabetes melitus selama 7 hari dapat menyebabkan menurunkan kadar glukosa darah.

Kata Kunci : Daun Kelor, Glukosa Darah, Diabetes Melitus.

1. INTRODUCTION

Diabetes mellitus is a chronic metabolic disorder caused by low physical activity, high sugar consumption, reduced insulin production, impaired insulin response in the body, or other hormones that inhibit insulin function (Astuti et al., 2024). Diabetes is a non-communicable disease that is spreading very rapidly across the world. This illness is characterized by elevated blood glucose levels equal to or greater than >200 mg/dl, because before and after meals, glucose levels can fluctuate. There are three types of diabetes mellitus classified according to the causes of increased blood sugar: Type I Diabetes Mellitus, Type II Diabetes Mellitus, Gestational Diabetes Mellitus that affects pregnant women and disappears after childbirth, and other types of diabetes mellitus usually caused by drug misuse, genetic disorders, and other diseases (Astuti et al., 2024).

Insulin plays an essential role in maintaining the body's balance. Type II Diabetes Mellitus occurs because blood glucose levels increase due to insulin resistance (Husnul et al., 2022). In the 21st century, diabetes mellitus has become one of the global public health problems, as the number of sufferers continues to rise in many countries.

According to the International Diabetes Federation (IDF) (2021), it is estimated that 1 in 10 people with diabetes in the world are between 20–79 years old, equivalent to 537 million individuals. This number is expected to increase to 784 million by 2045. This disease can affect all ages but occurs more frequently in China and India. IDF also recorded that in 2021, diabetes caused 6.7 million deaths worldwide, with 81% living in low- and middle-income countries, and it is estimated that 44% of individuals remain undiagnosed (IDF, 2021).

Nurses, as part of healthcare professionals, play an important role in treating this disease through promotive, preventive, curative, and rehabilitative efforts, as diabetes can lead to many complications. The promotive role includes providing knowledge about the definition, causes, signs and symptoms, classification, prevention, complications, and care of diabetes mellitus. The preventive role includes reducing foods high in sugar and salt, regular exercise, adequate rest, and routine blood sugar checks. The curative role includes collaborating with physicians regarding medications that lower blood glucose levels and advising families to use traditional



herbal remedies to reduce blood sugar levels. The rehabilitative role includes teaching self-care, increasing family compliance during treatment to prevent complications—supported by the content of Moringa leaves, which contain not only flavonoids but also saponins.

Saponins function as antidiabetic agents because they contain the enzyme α -glucosidase, which converts carbohydrates into sugar and is commonly found in the small intestine. In other words, if this enzyme is inhibited, blood sugar levels can decrease. Each component in Moringa leaves has different benefits; for example, vitamin A in beta-carotene helps reduce blood glucose levels, antioxidants support cell regeneration and protect against free radicals, vitamin C normalizes insulin hormones, and ascorbic acid helps the secretion of insulin in the blood. Zinc and other minerals in Moringa leaves also have antidiabetic properties because they help reduce glucose production and act as natural insulin. Antioxidants in flavonoids can also lower blood sugar levels (Astuti et al., 2024).

One of the functions of antioxidants is to suppress cell death without changing the division of pancreatic beta cells. These antioxidants also bind free radicals, ultimately reducing insulin resistance. Another function of flavonoids is to reduce the absorption of sugar and fructose in the intestine, which results in lowered blood glucose levels (Astuti et al., 2024).

Cilacap Regency ranks 9th in Central Java Province based on the top 10 disease patterns, with a total of 16,254 patients. In 2021, diabetes mellitus cases reached their highest number, at 3,646, exceeding cases of hypertension and epilepsy according to the Cilacap Health Department. In 2021, outpatient records at Cilacap Regional Hospital showed that non-insulin dependent DM ranked 6th, with 168 patients (Partinah, 2023).

A diabetes mellitus type II control program is urgently needed due to its impact on human resource quality and healthcare costs. One alternative treatment for diabetes mellitus is the use of Moringa leaves, as they contain antioxidants that can help reduce blood glucose levels. In addition, Moringa leaves are easy to find and relatively inexpensive (Arge, 2022).

Based on the background above, the author is interested in conducting a study entitled “Overview of Administering Moringa Leaf Decoction on the Reduction of Random Blood Glucose Levels in Mrs. D with Type 2 Diabetes Mellitus in Sikampung Village, Kroya District, Cilacap Regency.” This study aims to determine the effect of Moringa leaves on lowering blood sugar levels in individuals with diabetes mellitus.

2. RESEARCH METHOD

This study employed a qualitative descriptive method with a case study approach aimed at describing the effect of administering Moringa leaf decoction on reducing random blood glucose levels in a patient with type II diabetes mellitus (Nugraha, 2025). The research subject consisted of one respondent selected based on specific inclusion criteria: a female patient aged 45–70 years, having random blood glucose levels above 200 mg/dL, conscious (*compos mentis*), not taking antidiabetic medication, having no diabetes-related complications, and willing to consume herbal preparations. Data were collected through interviews, observations, and documentation. The interview process obtained information regarding the respondent’s



identity, medical history, and treatment history. Observations were carried out to monitor the patient's blood glucose levels before and after consuming Moringa leaf decoction for seven consecutive days. Documentation was used to support the findings, including observation sheets and records of daily blood glucose measurements.

The instruments used in this study consisted of interview sheets, observation sheets, and the Standard Operating Procedure (SOP) for preparing the Moringa leaf decoction. The intervention was performed by giving 150 ml of Moringa leaf decoction prepared by boiling 300 mg of Moringa leaves in 450 ml of water until it was reduced to one glass. The decoction was consumed every morning for seven days. Data analysis was conducted through four stages: data collection, data reduction, data presentation, and conclusion drawing. Ethical considerations were applied throughout the study, including obtaining informed consent from the respondent, ensuring anonymity by not revealing the respondent's real identity, and maintaining confidentiality of all data collected. The study took place in Sikampung Village, Kroya District, Cilacap Regency, and was conducted over a period of seven consecutive days from August 15 to August 21, 2025.

3. RESULT AND DISCUSSION

a. Case Study Results

Measurement of **blood glucose levels** in diabetic mellitus patients was carried out for seven days with the intervention of **moringa leaf decoction** (*Moringa oleifera*). The results of the measurements before and after the intervention are presented in the following table:

Table 4.1 Table of Blood Glucose Level (BGL) Measurement Before and After Moringa Leaf Decoction Administration

Day/Date	Blood Glucose Level Before Intervention	Blood Glucose Level After Intervention
15-08-2025	253	250
16-08-2025	240	230
17-08-2025	242	228
18-08-2025	223	220
19-08-2025	200	196
20-08-2025	198	190
21-08-2025	180	175

In general, a decrease in blood glucose levels can be observed from the first day to the seventh day of the intervention. However, the magnitude of the decrease is not consistently the same every day, but rather shows fluctuations. This suggests that the effect of moringa leaf decoction on blood glucose levels is dynamic and influenced by various factors, both internal and external.

b. Discussion



On the first day of intervention, the patient's blood glucose level before consuming the Moringa leaf decoction was 253 mg/dL and decreased to 250 mg/dL after the intervention, showing a small reduction of 3 mg/dL. This slight decrease can be explained physiologically, as the patient's body was still in the early phase of responding to the bioactive compounds contained in Moringa leaves. Flavonoids, alkaloids, and phenolic compounds in Moringa are known to work by inhibiting carbohydrate-digesting enzymes such as α -amylase and α -glucosidase and by improving insulin sensitivity; however, their pharmacological effect cannot appear within a few hours or after a single dose (Ilyas et al., 2022). In addition, variations in glucose levels may be influenced by the patient's lifestyle factors. For instance, high-carbohydrate intake prior to measurement or low physical activity may cause glucose levels to remain high despite the intervention. Previous studies have shown that the hypoglycemic effect of Moringa leaves becomes more noticeable after several consecutive days of administration rather than during the initial dose (Azizah et al., 2018). Therefore, the first-day result may be considered as a biological adaptation phase.

On the second day, a more significant reduction occurred, decreasing from 240 mg/dL to 230 mg/dL (a 10 mg/dL reduction). This shows that the bioactive components of Moringa leaves began to exert more noticeable effects on glucose metabolism. Flavonoids such as quercetin and kaempferol are known to enhance insulin sensitivity in muscle and liver tissues, enabling glucose to enter cells more efficiently for energy production (Kusuma et al., 2020). Furthermore, the high antioxidant content in Moringa leaves helps reduce oxidative stress in pancreatic β -cells. Oxidative stress is one of the main causes of β -cell dysfunction in diabetes, thus reducing it can improve the pancreas's ability to produce insulin. A clinical study by Febriyona & Igris (2025) supports this finding, reporting that several days of Moringa decoction therapy significantly lowered blood glucose levels in diabetic patients.

On the third day, blood glucose levels dropped from 242 mg/dL to 228 mg/dL, yielding the highest reduction of 14 mg/dL throughout the intervention. This suggests that the cumulative effect of Moringa leaf consumption had reached its peak. The accumulated bioactive compounds likely worked synergistically—both by inhibiting glucose absorption in the intestines and by increasing insulin sensitivity. According to Steffi et al. (2024), routine consumption of Moringa leaf extract provides a significant hypoglycemic effect in prediabetic patients by enhancing insulin effectiveness. The substantial reduction on the third day may also be supported by consistent dietary patterns or physical activity that reinforced the herbal therapy. Thus, the third day can be considered the peak response to the intervention.

On the fourth day, blood glucose levels decreased from 223 mg/dL to 220 mg/dL, showing a small reduction of 3 mg/dL. This smaller decrease can be explained by natural physiological fluctuations. Variations may result from changes in food intake, inadequate sleep, or psychological factors such as stress. Pangesti et al. (2024) argue that the body's response to herbal therapy such as Moringa is not linear but is influenced by complex internal and external factors. Therefore, even with consistent intervention, some days may show smaller reductions.



Nevertheless, the result still indicates a positive effect, as no increase was observed after the intervention.

On the fifth day, glucose levels decreased from 200 mg/dL to 196 mg/dL (a 4 mg/dL reduction). Although the reduction was not as large as on the second or third day, it remained consistent. This may be explained by the plateau effect, where the rate of reduction slows once a certain biological threshold is reached. This indicates that the patient's body was entering a stabilization phase. A study by Astuti et al. (2024) supports this, showing that reductions in blood glucose with Moringa decoction occur gradually, and at a certain point the decline rate slows while the trend remains consistent. Thus, the intervention remained effective, although the daily changes were not dramatically large.

On the sixth day, blood glucose levels decreased from 198 mg/dL to 190 mg/dL, showing an 8 mg/dL reduction. This indicates that the intervention once again produced a stronger effect. This may be due to the active compounds in Moringa—such as flavonoids, phenolic compounds, and isothiocyanates—reaching optimal plasma concentrations, thereby exerting stronger antihyperglycemic effects. Irfan (2024) explains that Moringa leaf extract can enhance insulin sensitivity by modulating pro-inflammatory pathways that contribute to insulin resistance. This enables glucose to be utilized more effectively by body cells, leading to decreased blood glucose concentrations.

On the final day, glucose levels declined from 180 mg/dL to 175 mg/dL, a reduction of 5 mg/dL. This result shows that Moringa leaf decoction was still effective, although the reduction was not as high as on the third or sixth day. This suggests that the patient's body may have reached a new steady state where blood glucose levels were more controlled. Steffi et al. (2024) reported that the hypoglycemic effect of Moringa tends to stabilize after several days of intervention. This implies that further reductions may require additional interventions, such as stricter dietary management, increased physical activity, or complementary pharmacological therapy.

4. CONCLUSION

Based on the results of the study, the administration of Moringa leaf decoction for seven consecutive days was proven to help reduce the patient's random blood glucose level from 253 mg/dL to 175 mg/dL after the intervention.

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