



The Effect of Soursop Leaf Decoction on Blood Sugar Levels in Type II Diabetes Mellitus Patients in Aek Parombunan, 2023

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ABSTRACT

Type 2 Diabetes Mellitus is a chronic disease characterized by hyperglycemia due to impaired insulin production or effectiveness. Indonesia has a high prevalence of Type 2 Diabetes Mellitus sufferers. One alternative therapy is the use of soursop leaves which contain active compounds such as flavonoids and tannins that can lower blood sugar levels. This study used a quasi-experimental design with a two-group pre-test post-test approach. The sample consisted of 30 respondents with Type 2 Diabetes Mellitus who were divided into control and intervention groups (15 respondents each). The intervention group was given 150 ml of soursop leaf decoction daily for 7 days. Data on blood sugar levels before and after the intervention were measured using a glucometer, and analyzed using a Paired T-test. The results showed that blood sugar levels in the intervention group experienced a significant decrease from all respondents who had high blood sugar levels (>200 mg/dL) before the intervention to almost all normal (100-140 mg/dL) after administering the soursop leaf decoction ($p = 0.000$). Meanwhile, in the control group, blood sugar levels remained largely high. Soursop leaf decoction was effective in lowering blood sugar levels in patients with Type 2 Diabetes Mellitus. This therapy can be a non-pharmacological alternative in managing diabetes mellitus.

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1. Introduction

Type 2 Diabetes Mellitus (Type 2 DM) is a global health problem with high prevalence, including in Indonesia. (Milita, Handayani, & Setiaji, 2021), (Widiasari, Wijaya, & Suputra, 2021) Chronic hyperglycemia due to insulin resistance or impaired insulin secretion triggers various complications. Treatment approaches for DM These include pharmacological and non-pharmacological therapies. One alternative therapy is the use of herbal plants, including soursop leaves (*Annona muricata*), which are rich in bioactive compounds. (Nurmawati, 2019), (Ns Mohamad Roni Alfaqih & Ns Mei Fitria Kurniati, nd) This study aims to analyze the effectiveness of soursop leaf decoction in lowering blood sugar levels in Type 2 DM patients at the Aek Parombunan Community Health Center. The impact of untreated diabetes mellitus includes negative physical and psychological impacts on patients, including physical disorders such as polyuria, polydipsia, polyphagia, and complaints of fatigue and drowsiness. (Mughtar, Muharni, & Fadli, 2023), (Andriani, 2021), beside That Patients may experience blurred vision, weakness, and headaches. Psychological impacts include anxiety, anger, grief, shame, guilt, loss of hope, depression,

loneliness, and helplessness. Management of diabetes mellitus involves following four pillars: diet, physical activity, pharmacological therapy, and education.(Harahap, 2023),(Surjoseto & Sofyanty, 2022)Pharmacological therapy, namely insulin therapy and regular therapy to prevent high blood sugar levels that lead to complications.(Putra & Berawi, 2015),(Nurrahman, 2020).

Non-pharmacological therapies for diabetes mellitus include soy milk, periwinkle root, a 30-minute walk, and acupressure. Other treatments include dragon fruit, shallots, turmeric, guava, avocado, apple, starfruit, ground cherry, bay leaves, jambolan fruit, black soybeans, watermelon, soursop leaves, and aloe vera.(Mughtar et al., 2023),(Fadli, 2022)Diabetes Mellitus (DM) is a disease that is closely related to food intake. Eat such as carbohydrates or sugar, protein, fat, and energy Too much can be an early risk factor for DM. The greater the food intake, the greater the possibility of causing DM(Wahyuni, 2019)Diabetes Mellitus is a symptom of metabolic disorder characterized by blood sugar levels above normal limits, thus affecting the metabolism of carbohydrates, fats, and proteins, accompanied by multi-factorial etiology.(Wahyuni, 2019).

Diabetes mellitus (DM) is a metabolic disease with multiple etiologies characterized by high blood sugar levels accompanied by impaired carbohydrate, lipid and protein metabolism as a result of insulin function insufficiency. Insufficiency Insulin deficiency can be caused by disruption or deficiency of insulin production by the beta (β) cells of the Langerhans gland. pancreas, or caused by the body's cells being less responsive to insulin(Emilda, 2018).

Classification There are several types of DM and the following is an explanation of the classification Volume 17, Number 3 July 2023 | ISSN (P): 1829-7463 \ ISSN (E): 2716-3083 Dharmawangsa University 1321 DM according to Carracher et al (2018) namely: (1) Type 1 diabetes mellitus or Insulin Dependent Diabetes Mellitus/IDDM Type 1 DM is caused by the destruction of pancreatic beta cells due to autoimmune causes. Insulin secretion can be determined by the level of c-peptide protein which is 12 small or not detected at all. The first clinical manifestation of the disease is ketoacidosis. (2) Diabetes mellitus type 2 or Insulin Non-dependent Diabetes Mellitus In this type of DM, hyperinsulinemia occurs but insulin can't transporting glucose into the tissues due to insulin resistance, which is a decrease in insulin's ability to stimulate glucose uptake by peripheral tissues and to inhibit glucose production by the liver. Due to insulin resistance (insulin receptors are no longer active because they are considered to have high levels in the blood), it will result in a relative insulin deficiency. This can result in a lack of insulin secretion on glucose along with other insulin secretory substances so that pancreatic beta cells will experience desensitization to the presence of glucose. The onset of this type of DM occurs slowly, therefore the symptoms are asymptomatic. The presence of insulin resistance that occurs slowly will result in the sensitivity of the receptors to glucose. Gestational diabetes mellitus. Patients with gestational diabetes have a high risk of developing diabetes that persists for 5-10 years after delivery. This type of DM occurs during pregnancy, where glucose intolerance is first found during pregnancy, usually in the second and third trimesters (Mato, 2023).

Other types of diabetes mellitus This type of DM occurs due to other etiologies, for example genetic defects in beta cell function, genetic defects in insulin function, exocrine pancreatic disease, other endocrine metabolic diseases, iatrogenic, viral infections, autoimmune diseases and other genetic disorders.(Nurrohman, 2023)Pathophysiology: The pancreas is a gland located behind the stomach, which contains a collection of cells called the islets of Langerhans, which contain pancreatic cells.

beta that Producing the hormone insulin plays a role in regulating the part of the soursop plant that has anti-diabetic properties is the leaves. Soursop leaves have far more benefits than the fruit itself. Soursop leaves contain acetogenins, annocatacin, annocatalin, anno hexocin, annonacin, anomuricin, anomurine, ananol, caclourine, gentisic acid, gigantetronin, linoleic acid, muricapentocin, flavonoids, alkaloids, phytosterols, myricyl alcohol and ananol.

2. Methods

Identifying The effect of giving boiled soursop leaf water on reducing blood sugar levels in type 2 diabetes mellitus patients at the Aek Parombunan Community Health Center.

3. Results and Discussion

This research was conducted at the Aek Parombunan Community Health Center, Sibolga City in 2023 with 30 respondents suffering from Type 2 Diabetes Mellitus, consisting of 15 respondents in the intervention group (given soursop leaf decoction) and 15 respondents in the control group (not given soursop leaf decoction).

3.1 Respondent Characteristics

a. By Gender

Table 1
Frequency Distribution of Respondents Based on Gender Type

	Gender Frequency (n)	Percentage (%)
Man	11	36.7%
Woman	19	63.3%
Total 30	100%	Total 30

Results: Most of the respondents were female (63.3%).

b. By Age

Table 2
Frequency Distribution of Respondents Based on Age Age (Years)

	Frequency (n)	Percentage (%)
40–50	5	16.7%
51–60	12	40%
>60	13	43.3%
Total 30	100%	Total 30

Results: The majority of respondents were aged >60 years (43.3%).

c. Based on Education

Table 3.
Frequency Distribution of Respondents Based on Education Education Frequency (n) Percentage (%)

	Education Frequency (n)	Percentage (%)
Elementary School	10	33.3%
Junior High School	7	23.3%
High School	9	30%
PT	4	13.3%
Total 30	100%	Total 30

Results: Most of the respondents with low education (SD = 33.3%).

3.2 Respondents' Blood Sugar Levels

a. Before Giving Soursop Leaf Decoction (Intervention Group)

Table 4
Blood Sugar Levels Before Intervention

Blood Sugar Levels	Frequency (n)	Percentage (%)
Normal (100–140 mg/dL)	0	0%
Moderate (141–200 mg/dL)	4	26.7%
High (>200 mg/dL)	11	73.3%
Total	15	100%

Results: Most respondents had high blood sugar levels before the intervention (73.3%).

b. After Giving Soursop Leaf Decoction (Intervention Group)

Table 5
Blood Sugar Levels After Intervention

Blood Sugar Levels	Frequency (n)	Percentage (%)
Normal (100–140 mg/dL)	12	80%
Moderate (141–200 mg/dL)	3	20%
High (>200 mg/dL)	0	0%
Total	15	100%

Results: After the intervention, most respondents (80%) experienced a decrease in blood sugar levels to the normal category.

c. Control Group (Without Giving Soursop Leaf Decoction)

Table 6
Blood Sugar Levels in the Control Group

Blood Sugar Levels	Frequency (n)	Percentage (%)
Normal	0	0
Currently	5 (33.3%)	4(26.7%)
Tall	10 (66.7%)	11 (73.3%)

Results: There were no significant changes in the control group, in fact there was an increase in the number of respondents with high blood sugar levels.

3.3 Statistical Analysis

Paired T-Test (Intervention Group) p-value = 0.000 ($p < 0.05$): This means there is a significant difference in blood sugar levels before and after giving soursop leaf decoction in the intervention group. Paired T-Test (Control Group) p-value = 0.432 ($p > 0.05$): This means there is no significant difference in blood sugar levels before and after giving soursop leaf decoction in the intervention group. in the control group. Independent T-Test (Intervention vs Control Group) p-value = 0.000 ($p < 0.05$): This means there is a significant difference between the intervention and control groups after treatment.

4. Conclusions

Conclusion: Soursop leaf decoction effectively lowers blood sugar levels in people with type 2 diabetes. This therapy can be used as a complementary therapy, but further research with longer durations and larger samples is needed to assess long-term safety.

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