

Application of soursop leaf decoction to reduce glucose levels in patients with diabetes mellitus: a literature review

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ABSTRACT

According to the *World Health Organization* (WHO), the prevalence of people with diabetes mellitus is 8.5%. A total of 422 million people in the world are diagnosed with diabetes mellitus.^{1,2}In 2017, the prevalence of people with diabetes mellitus increased to 8.8%, as many as 425 million people. Diabetes mellitus (DM) is a clinical syndrome of metabolic disorders. The disease is characterized by high blood sugar in the human body. Diabetes mellitus is one of the world's health problems that deserves attention. The prevalence of diabetes mellitus is increasing every year. The purpose of this study was to determine the effect of soursop leaf decoction (*Annona Muricata* L) on reducing blood glucose levels in people with diabetes mellitus. The method of using a literature review study using 6 national journals with a search through google scholar. The results of a review of 6 journals prove that there is a decrease in glucose levels in people with diabetes mellitus by giving soursop leaf decoction. Planning is carried out lavender aroma therapy to reduce the intensity of the pain scale. The implementation of the intervention is carried out for 10-15 minutes a day.

Keywords: Diabetes Mellitus; Glucose level; Soursop leaves; Blood sugar

INTRODUCTION

Indonesia is the country with the fifth highest prevalence of diabetes cases in the world. This ranking is higher than in 2019 when Indonesia ranked seventh in the world. The reason is, according to data from the International Diabetes Federation (IDF), the number of diabetics in Indonesia continues to increase from 10.7 million people in 2019, to 19.5 million in 2021. Even more worrying, 50 percent of the 19.5 million diabetics are estimated to have not been diagnosed. Meanwhile, only 13 percent of patients have been diagnosed and undergoing treatment through the National Health Insurance (JKN), and only 1.2 percent of cases are well controlled. (Pranita, 2022).

Diabetes Mellitus is a disease characterized by the occurrence of hyperglycemia and disruption of carbohydrate, fat, and protein metabolism which is associated with an absolute or relative deficiency of insulin work and/or secretion. Symptoms complained about in patients with Diabetes Mellitus are polydipsia, polyuria, polyphagia, decreased weight gain, tingling. (Fatimah, 2015) The use of plants as traditional medicine in various diseases has been widely used, traditional medicine from natural ingredients is one of the alternative treatments, one of the

One is diabetes mellitus. The use of natural ingredients, both as medicine and as processed foods, tends to increase, especially with efforts to utilize natural ingredients. (Widiastuti et al., 2022) Soursop leaves (*Annona muricata* L.) are plants that have been used extensively empirical by the public because of one of its benefits as an antioxidant. Soursop leaves are known to contain a lot of compounds including steroids/terpenoids, flavonoids,

coumarins, alkaloids, and tannins. (Setiowati et al., 2018)

Diabetes Mellitus (DM) is a metabolic disorder characterized by increased glucose levels in the blood of the acupia deficiency or decrease in the effectiveness of insulin. This diabetic is caused by the state of the body unable to produce the hormone insulin at all. People with diabetes should use insulin injections to regulate their blood glucose. The excess glucose wasted in the urine causes the patient's urine to be often approached by ants because it contains sugar or glucose so it is called diabetes (Wijayakusuma, 2010).

Diabetes Mellitus is a chronic disease characterized by blood glucose levels exceeding normal values. Diabetes mellitus can affect all ages and socioeconomic groups. If the blood glucose test results at ≥ 200 mg/dl and fasting blood glucose ≥ 126 mg/dl, it is enough to establish a diagnosis of diabetes mellitus. Specific symptoms of diabetes militancy include polyurea, polydipsi, polyphagy, and weight loss of unknown cause. Other complaints are weakness, tingling in the fingers and toes, itching, blurred eyes, erectile dysfunction in men, as well as vulvae pruritus in female patients, wounds that are difficult to heal (Soegondo, et al., 2005).

The death rate due to DM disease is very high in Indonesia.

Indonesia occupies the second position after Sri Lanka. There is an increase in percentages

The national incidence of DM disease in Indonesia in 2012 was 4.8%, then in 2014 it was 5.85%³ and in 2018 it was 3.4%.

Managing blood sugar levels can be done using herbal plants. The use of natural ingredients derived from herbs for medicinal purposes or other purposes tends to increase, supported by the issue of back to nature.⁶ The choice of the use of herbs as

a treatment for rising blood sugar levels, on the grounds that herbal therapy does not have side effects.

METHOD

The design of this study used a literature study based on a literature review and 6 significant journal reviews on nursing interventions aimed at exploring the reduction of glucose levels in patients with diabetes mellitus: by administering soursop leaf decoction. Literature studies are literature reviews, literature reviews, theoretical studies, theoretical foundations, literature reviews and theoretical reviews.

Where literature researchers are research that is carried out only based on written works, including research results.

RESULTS

In this chapter, the results of journal reviews and discussions of case studies in the form of literature that I obtained from six journals related to soursop leaf decoction therapy to reduce blood glucose levels in patients with diabetes mellitus will be described.

Based on the results of the literature review obtained from 6 journals, it can be seen in table 1.1

Table 1.1 Database Results

Yes	Author	Year	Volume	Title	Method	Results	Link
1.	Sunarti, Solihat i	2021	1 No. 2	Effect of soursop leaf decoction on reducing blood glucose levels in patients with type II diabetes mellitus In the sand of the ants of Mount Kaler	Design: The design used is a pre-experimental type with a pretest-posttest group design. Sample: With the sample taken, as many as 15 people with diabetes mellitus were willing to be respondents. Variables: Patients with a history of diabetes mellitus Instruments: Based on statistical tests, normal distribution data was obtained and a Ttest (dependent) test was carried out, namely with the simple paired T-test statistical test used in this study.	The results of the study on the effect of soursop leaf decoction on the reduction of blood glucose levels in people with diabetes mellitus in the ant sand of Mount Kaler, Tangerang Regency in 2020 can be concluded that there is an effect of soursop leaf decoction on the reduction of blood sugar levels in patients with diabetes mellitus with the average value of blood sugar levels before giving The results of the study on the effect of soursop leaf decoction water on the reduction of blood glucose levels in Patients with diabetes mellitus in the ant sands of Gunung Kaler, Tangerang Regency in 2020, it can be concluded that there is an effect of soursop leaf decoction on the reduction of blood sugar levels in patients with diabetes mellitus with the average value of blood sugar levels before being given	https://nusantarahasanajournal.com/index.php/nhj/article/view/37
2.	Putri Sagita, Ety Aprilia	2021	03 No.1	Effect of Soursop Leaves (Annona	Design: The design used is a type of pseudo-experimental research with a pre and posttest	Results : The effect of soursop leaves (Annona muricata) on diabetes mellitus has	https://www.jurnalmedikahutama.com/index

	na , Sofyan Mussa biq , Tri Umian a Soleha			Muricata) on Diabetes Mellitus Disease	control group. Sample: The sample in this study was 127 Respondent Variable: Patients who have a history of diabetes mellitus Instrument: Instrument Usage Verbal Analogue Scale (VAS) Observation Sheet Analysis: Analysis using the Wilcoxon test	been proven to reduce blood sugar levels in patients with diabetes mellitus with blood glucose levels before being given a boil of soursop leaves with an average of 431.20 mg/dl and a standard deviation of 104.82 mg/d. Meanwhile, the average blood glucose level after being given soursop leaf boiled water (Annona muricata l) was 267.90 mg/dl and the standard deviation was 100.14 mg/dl. with a significant degree <0.05	http://jmh/article/view/262
3.	Febriyanti, Yola Yolanda	2020	XIV No.01	Effect of Soursop Leaf Stew (Annona Muricata) on Blood Sugar Levels in Patients with Type II Diabetes Mellitus in Nagari Permatang panjang, Working Area of Situnjung Health Center	Design: This type of research is Experimental with a One Group Pretest Posttest Design approach Sample: The sample in this study is actually 35 Respondent Variable: Patients who have a history of diabetes mellitus Instruments: The instruments used in this study, namely rapid test blood sugar levels, measuring cups, observation sheets of blood sugar and soursop level measurement results and the schedule for giving soursop leaf decoction are the materials used in this study. Analysis: Analysis N. Test Wilcoxon	Results : The Average Blood Glucose Level before being given Soursop Leaf Boiled Water (Annona Muricata L) was 431.20 mg/dl and the standard deviation was 104.82 mg/dl and the Average Blood Glucose Level after being given Soursop Leaf Boiled Water (Annona Muricata L) was 267.90 mg/dl and the standard deviation was 100.14 mg/dl. The results of bivariate analysis with the statistical paired samples t test There is an influence	https://jurnal.umsb.ac.id/index.php/menarailmu/article/view/2120
4.	Siti Fadlilah , Adi Sucipto, Nazwar Hamdani Rahil, Sumarni	2020	16 No.1	Soursop Leaf (Annona muricata L.) Effective in Lowering Blood Sugar Levels	Design: The type of research is a pseudo-experiment or quasi-experiment pre and design experiment Posttest Control Group. Sample: The sample is a community part of the large population The sample was calculated using the slovin formula with a precision level of	Results: blood glucose levels before and after being given soursop leaf decoction (Annona Muricata L) on the decrease in blood glucose levels in patients with Type II Diabetes Mellitus in Nagari Pematang Panjang, Sijunjung Health Center Working Area in 2018 with a value of p =	https://repository.unar.ac.id/jspui/bitstream/123456789/3942/1/15-25.pdf

				1% and obtained 86 respondents. The sample was divided into 2 groups, namely the control group and the intervention group. The number of samples in each group was 43 respondents. Variable: Patients who have a history of diabetes mellitus Instruments: The normality test used the Kolmogorof-Smirnov test (sample >50). The results of the normality test were obtained abnormal results (p)	0.000 (p < 0.05).	
5.	Benny Rianto	2022	1 No.1	Effectiveness of Soursop Leaves on Blood Sugar Levels in Patients with Diabetes Mellitus Design: This study is a literature study that presents the effect of soursop leaf decoction on diabetes mellitus using secondary data Sample: Variable: Patients who have a history of diabetes mellitus Instruments: The T-test with a confidence interval of the difference of 95% obtained a significant value = 0.000 meaning p < 0.05, m	Soursop leaves function to repair pancreatic cells by increasing their granulation. This increase in granulation aims to increase insulin production and be more effective. In addition, the tannin content in soursop leaves functions to repair cells, protect pancreatic cells and act as an antioxidant in warding off free radicals derived from hyperglycemia so as to inhibit the occurrence of complications. (Fadlilah et al., 2020).	file:///D:/D:\oc\tugas%20sarah%20semester%206\literatur%20review%20keluarga/26-32.pdf
6.	Edy Agustian Yazid, Erma Suryani	2017	7 No.14	Blood glucose levels before and after administration of star fruit leaf extract and soursop leaves in people with diabetes mellitus Design: This study uses an experimental method with quantitative analysis techniques Sample: The study was conducted on 20 people with DM consisting of 2 experimental groups, 10 people were given star fruit leaf extract (A) and 10 people were given soursop leaf extract (B). Variable: Patients who have a history of diabetes mellitus Instruments: In this study, data collection was carried	The results of this study showed that overall the response experienced a decrease in blood glucose levels after the addition of soursop leaf extracts for 7 days. Soursop leaf extract can lower blood glucose levels because it contains alkaloids and flavanoids. Alkaloids lower blood glucose by inhibiting glucose absorption in the intestines, while flavanoids have the ability to stimulate insulin production or have insulin-like compounds (Singab, 2005).	file:///D:/D:\oc\tugas%20sarah%20semester%206\literatur%20review%20keluarga/1388.pdf

DISCUSSION

Diabetes mellitus (DM) is a clinical syndrome of metabolic disorders. The disease is characterized by high blood sugar in the human body or normal called hyperglycemic condition. The condition is caused by a defect in insulin secretion, insulin work defects, or both.^{16,17} High blood sugar levels or hyperglycemia are one of the typical signs of disease in a person with diabetes mellitus. Will

However, other traits may also be found in some conditions of people with diabetes.

The pathophysiology of diabetes mellitus is divided into two, namely type I diabetes mellitus and type II diabetes mellitus. Both are conditions with high blood sugar levels in the blood. However, the pathophysiology between the two is different. Type 1 diabetes mellitus occurs due to damage to the cells β the pancreas itself so that insulin production by pancreatic β cells is disrupted. This can occur due to an autoimmune reaction in the body due to inflammation that occurs in cells β pancreas.

Antibodies to pancreatic β cells are called Islet Cell Antibodies or ICA for short. The reaction of antigens (β cells) with ICA antibodies causes damage or destruction of pancreatic β cells. In type II diabetes, it occurs due to damage or interference with insulin receptors so that insulin function is disrupted. Basically, the insulin hormone produced by cells β pancreas is normal or increased in the body, but due to insulin receptors being resistant or disrupted on the surface of the cell, there is less glucose that should enter the cell. Glucoses that should be able to enter these cells remain in the blood vessels, resulting in increased

blood sugar levels.^{19,20} Classic symptoms of diabetes that often appear in diabetics are polyuria, polyphagy, polydipsi, and weight loss.^{21,22,23} Polyurie is a condition that occurs a lot of urine that occurs in diabetics. Polydipsy is a condition in which a person will feel thirst continuously, this is caused by compensation arising from polyurie experienced by diabetics. As a result of a lot of urine being excreted, the patient will feel thirsty, therefore the patient will drink a lot because of the thirst suffered. Polyphagi (eating a lot) Polyphage occurs due to a reduced ability of insulin to manage blood sugar levels so that sufferers feel excessive hunger.

CONCLUSION

Soursop (*Annona muricata*) is widely known for the sour and sweet taste of its fruit. Soursop fruit is also called prickly apple or dutch durian. In Indonesia, this plant is called soursop or dutch jackfruit. This plant has the taxonomic classification of the kingdom Plantae, the division of Angiosperms (Magnoliophyta), the class Magnolid, the order Magnoliales, the family Annonaceae, the genus *Annona* and the species *A. muricata* L. The influence of soursop leaves (*Annona muricata*) on diabetes mellitus has been proven to reduce blood sugar levels of patients with diabetes mellitus. This can occur due to the content of antidiabetic compounds such as flavonoids, alkaloids, tannins, phenols, and quercetin contained in soursop leaves.

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