
Original Article

THE EFFECT OF SOURSOP LEAF TEA ON REDUCING BLOOD SUGAR LEVELS IN DIABETES MELLITUS PATIENTS

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ABSTRACT

Background: In Indonesia, many people do not pay attention to healthy lifestyles in order to maintain stable blood sugar to prevent diabetes mellitus, which increases every year.

Objective: The aim of this research was to determine the effect of soursop leaf tea on reducing blood sugar levels in diabetes mellitus sufferers at the Dukuh Klopó Community Health Center, Peterongan, Jombang.

Method: The research design was a pre-experimental - one group pre test-post test design. The population in this study was 153 people, all sufferers of diabetes mellitus at the Dukuh Klopó Community Health Center using purposive sampling technique, a sample of 23 people. The independent variable is soursop leaf tea. The dependent variable is a decrease in blood sugar levels in diabetes mellitus sufferers. Data collection uses SOP and observation sheets with the Wilcoxon statistical test.

Results: Based on the research results, it was discovered that all 23 respondents (100%) had high blood sugar levels before being given soursop leaf tea therapy. Meanwhile, after being given therapy, some respondents, namely 12 respondents (52%) were in the moderate category and 11 respondents (48%) were in the normal category. The results of the Wilcoxon test at a significance level of $\alpha = 0.05$ showed that $p < \alpha$ or $0.000 < 0.05$, so H_1 was accepted and H_0 was rejected, which means that there is an effect of soursop leaf tea on reducing blood sugar levels in diabetes mellitus sufferers at the Dukuh Klopó Community Health Center, Peterongan, Jombang.

Conclusion: Giving soursop leaf tea can reduce blood sugar in diabetes mellitus sufferers and is expected to be an alternative intervention to reduce blood sugar, because soursop leaves can improve pancreatic cells by increasing their granulation. Apart from that, the high antioxidants in soursop leaves can reduce free radicals that come from hyperglycemia.

Keywords: Diabetes Mellitus, Soursop Leaves, Reducing Blood Sugar Levels.

INTRODUCTION

Today's modern world has triggered changes in people's lifestyles. Along with the changing times, natural eating patterns have also changed to become modern. Unhealthy food

menu choices and lifestyles are increasingly spreading throughout society. Consuming unhealthy foods such as fast food, fizzy drinks and other types of sweet foods is a change in lifestyle and lifestyle that greatly affects blood sugar levels. More and more people consume ready-to-eat food and add preservatives, artificial colors and flavors to food, and smoking often triggers the development of degenerative diseases such as diabetes mellitus. An unhealthy lifestyle is one of the reasons this disease continues to increase in the number of sufferers from year to year. Lifestyle is known to have a significant influence on the occurrence of diabetes mellitus, by reducing the incidence of diabetes through good eating habits. Blood sugar levels increase drastically after consuming certain foods because the food consumed tends to have uncontrolled blood sugar content (Sunarti, 2021).

World Health Organization (WHO) 2021 data states that 537 million people in the world suffer from diabetes mellitus. The number of diabetes sufferers in 2021 has increased rapidly in the last ten years. The number of diabetes sufferers in Indonesia continues to increase from year to year. In 2021, the International Diabetes Federation (IDF) recorded that 537 million adults (aged 20-79 years) or 1 in 10 people live with diabetes worldwide. Diabetes also causes 6.7 million deaths or 1 every 5 seconds. Based on data from the International Diabetes Federation (IDF), the number of diabetes sufferers in Indonesia has almost doubled in just two years. From 10.7 million people in 2019 to 19.5 million people in 2021. Based on the prevalence of diabetes in East Java, East Java province is in the top 10 people with diabetes mellitus in Indonesia or ranks ninth with a prevalence of 6.8%. The number of diabetes mellitus sufferers in East Java province in 2021 is 867,257 people. (JATIM HEALTH DISTRICT). The number of diabetes mellitus cases in Jombang Regency in September 2022 was 783 people. Meanwhile, at the elderly posyandu at the Dukuh Klop Community Health Center from January to September 2022 there were 153 people.

METHODS

Study Design

The design of this research is Quasi-Experimental Design with a One-Group Pretest-Posttest approach.

Settings

This research was carried out on 19-25 June 2023 at the Dukuh Klop Community Health Center, Peterongan, Jombang.

Research Subject

The population in this study were all Diabetes Mellitus sufferers who lived in the working area of the Dukuh Klop Community Health Center, Peterongan, Jombang, totaling 153 people. The sampling technique used in the research was a purposive sampling technique, so that the sample size in this study was 23 respondents.

Instrument

The research instruments used in this research are Standard Operating Procedures (SOP) for Implementing Action Procedures and observation sheets.

Data Collection

Before conducting the research, the researcher submitted a request for permission to carry out the research to the Head of the Dukuh Klop Community Health Center, Peterongan, Jombang and the College of Health Science of Husada Jombang. After obtaining permission to carry out the research, the researchers determined potential respondents in this study. After

obtaining potential respondents, the researcher explained the purpose of conducting the research, procedures for conducting the research, as well as the rights and responsibilities as respondents in this research. After that, the researchers asked for informed consent from potential respondents as a sign of their agreement to become subjects in this research. After obtaining consent as respondents, the researchers conducted their research in accordance with the procedures set out in the SOP.

Data Analysis

Data analysis used the Wilcoxon test with a significance level of 0.05 using SPSS 16 for Windows, it was found that $p = 0.000 < \alpha (0.05)$, H_0 (null hypothesis) was rejected, meaning that there was an effect of soursop leaf tea on reducing blood sugar levels in diabetes mellitus sufferers. at the Dukuh Klopo Community Health Center, Peterongan, Jombang.

Ethical Consideration

This research has been carried out ethical testing and was declared to have passed with ethical test number 0809-KEPKSHJ.

RESULTS

Characteristics of Respondent

Table 1. Frequency Distribution of Respondent Characteristics Based on Gender, Age, Educational Levels, and Occupational at the Dukuh Klopo Community Health Center, Peterongan, Jombang (n = 23).

Characteristics of Respondent	Frequency (f)	Percentage (%)
Gender		
Male	3	13.04
Female	20	86.06
Total	23	100.00
Age		
45-59 years	12	52.17
60-74 years	11	48.83
75-90 years	0	0.00
Total	23	100.00
Educational Levels		
No School	7	30.43
Elementary School	16	69.57
Junior High School	0	0.00
Senior High School	0	0.00
University	0	0.00
Total	23	100.00
Occupational		
Housewife	15	65.22
Farmer	3	13.04
Civil servants	0	0.00
No Work	5	21.74
Total	23	100.00

Sources: Questionnaire Data, 2023

Based on the research data in table 1, it can be seen that almost all of the respondents, namely 23 people, were female. More than half of the respondents, namely 12 respondents

aged 45-59 years and almost 11 respondents aged 60-74 years. More than 16 respondents had elementary school education. More than the majority of respondents work as housewives, namely 15 respondents.

The Effect of Providing Soursop Leaf Tea Therapy on Reducing Blood Sugar Levels in Diabetes Mellitus Sufferers

Table 2. The Effect of Providing Soursop Leaf Tea Therapy on Reducing Blood Sugar Levels in Diabetes Mellitus Sufferers at the Dukuh Klop Community Health Center, Peterongan, Jombang (n = 23).

No	Blood Sugar Levels	Soursop Leaf Tea Therapy			
		Before		After	
		f	%	f	%
1	Normal	0	0	11	48
2	Moderate	0	0	12	52
3	High	23	100	0	0

Wilcoxon test with a significance level of 0.05 found $p = 0.000 < \alpha (0.05)$, H_0 (null hypothesis) was rejected.

Based on table 2, it is known that before being given therapy, all respondents were 23 respondents in the high category, while after being given therapy, some respondents were 12 respondents in the medium category and 11 respondents in the normal category. Wilcoxon test results with a significance level of 0.05 using SPSS 16 for Windows showed that $p = 0.000 < \alpha (0.05)$, H_0 (null hypothesis) was rejected, meaning that there was an effect of soursop leaf tea on reducing blood sugar levels in diabetes mellitus sufferers at the Dukuh Klop Community Health Center, Peterongan, Jombang.

DISCUSSION

Blood Sugar Levels Before Given Soursop Leaf Tea Therapy

Based on table 2, it is known that before being given therapy, all respondents, namely 23 respondents (100%) were in the high category.

Increased blood sugar levels due to insulin resistance cause insulin's ability to reduce blood sugar levels and can result in the pancreas having to secrete more insulin to regulate blood sugar levels. The condition of resistance will continue and become increasingly severe, while the pancreas is no longer able to continuously increase its ability to secrete enough insulin to control blood sugar, which results in high blood sugar (Brunner & Sudart, 2019).

Based on the research results, it is known that almost all of the respondents, namely 11 respondents (48%) were aged between 60-74 years. The American Diabetes Association (ADA) (2021) states that the risk of type diabetes mellitus increases with age. According to the researchers' assumptions, there is a relationship between age and the incidence of diabetes mellitus that was obtained during the research, as basically every person will definitely experience what is called increasing age and age itself becomes a factor that influences a person's health behavior.

The mechanism underlying the higher risk of this type of diabetes mellitus in older individuals is an increase in the composition of fat in the body which accumulates in the

abdomen, thus triggering central obesity. Central obesity then triggers insulin resistance which is the initial process of type diabetes mellitus (Suastika et al, 2021).

Based on the research results, it is known that more than half of the respondents, namely 16 respondents (70%) have elementary school education and 7 respondents (30%) have no school education.

Education means guidance given by someone to the development of others towards certain ideals. So, it can be said that education requires humans to act and fill their lives to achieve safety and happiness.

From the description above, it is known that all respondents have high blood sugar levels. This is caused by the respondent's low education so that it is difficult for the respondent to obtain information related to the disease they have received.

Based on research results, it is known that more than the majority of respondents work as housewives, namely 15 respondents (65%). Work is a series of tasks or activities that must be carried out or completed by someone according to their respective position or profession.

Based on the research results, it is known that more than half of the respondents who work as housewives have high blood sugar levels. Housewives who tend to stay at home a lot and take care of housework can make it difficult for respondents to receive information, thus influencing mothers' behavior in frequently consuming food which can trigger an increase in blood sugar levels.

Employment status often influences a person's opportunity to obtain information (Notoatmodjo, 2021). A person's employment status indicates a person's income level and the free time they have. Mothers who do not work or housewives have a lot of free time to take care of their family (Suririnah, 2014).

Blood Sugar Levels After Being Given Soursop Leaf Tea Therapy

Based on table 2, it is known that after being given therapy, some of the respondents were 12 respondents (52%) in the moderate category and 11 respondents (48%) in the normal category.

This shows that the longer we consume soursop leaf tea, the more positive changes it can have in reducing blood sugar levels. This could be because during the research the respondents were able to work together well, namely by following the procedures set by the researcher.

Respondents drank soursop leaf tea before eating because it is absorbed more quickly and added to the content in soursop leaves, namely flavonoids and tannins, it can inhibit damage to cells of the islets of Langerhans in the pancreas and regenerate cells so that they produce insulin again and blood sugar levels increase. decline.

Based on the research results, it shows that after giving soursop leaf tea once a day for 7 days, the blood sugar levels for respondents decreased from the high to medium and normal categories. This is because during the research the respondents were able to work together well, namely, the respondents drank soursop leaf tea at night before going to bed because it was absorbed more quickly and in addition to the contents of soursop leaves, namely flavonoids and tannins.

This is in accordance with Mardiana's theory (2012) to reduce blood sugar levels in diabetes mellitus sufferers, one of which can be done non-pharmacologically, namely by giving

water boiled with soursop leaves. One of the contents of soursop leaves is flavonoids and tannins. Flavonoids have antioxidant properties because they can capture free radicals by freeing hydrogen atoms from their hydroxyl groups. They are anti-diabetic because flavonoids are able to act as compounds that can neutralize radicals.

Effect of Soursop Leaf Tea on Reducing Blood Sugar Levels

Based on table 2, it shows that there were changes in blood sugar levels in respondents before being given therapy, all respondents were in the high category, while after being given therapy, some respondents were 12 respondents in the medium category and 11 respondents in the normal category. The test results were strengthened based on the results of analysis using the Wilcoxon test at a significance level of $\alpha = 0.05$, it was found that $p < \alpha$ or $0.000 < 0.05$, so H_1 was accepted and H_0 was rejected, which means that there is an effect of soursop leaf tea on reducing blood sugar levels in diabetes mellitus sufferers at the Dukuh Klop Community Health Center, Peterongan, Jombang.

Based on the respondent's statement after consuming boiled soursop leaves, this statement was also supported by the results of checking blood sugar levels after being treated for 7 days and showed a decrease in the respondent's blood sugar levels. Therefore, the most important thing in controlling diabetes mellitus is controlling risk factors. From the research above, researchers assume that the decrease in blood sugar levels is due to the content of beta cytosol and stigmasterol which are able to suppress or reduce blood sugar levels. So, respondents who suffer from diabetes mellitus need soursop leaf tea therapy to lower blood sugar levels. Giving soursop leaf tea can also be balanced with a dietary pattern to prevent an increase in blood sugar levels.

The results of research on soursop leaf tea showed that there was a decrease in blood sugar levels after giving soursop leaf tea to people with diabetes mellitus, due to the content contained in soursop leaves. This is in accordance with Mardiana (2021) that soursop contains flavonoid compounds. Flavonoids have antioxidant properties because they can capture free radicals by freeing hydrogen atoms from their hydroxyl groups, have antidiabetic properties because flavonoids are able to act as compounds that can neutralize free radicals so they can prevent damage to pancreatic beta cells, are antiseptic and anti-inflammatory.

Kumari (2021) apart from flavonoid compounds which function as anti-diabetics, there are also tannin compounds which also function as anti-diabetes. Tannin is able to reduce blood sugar levels by increasing glucose uptake through the activation of MPAK (Mitogen Activated Protein Kinase) and PI3K (Phosphoinositide 3-Kinase). Iyos and Astuti (2021) hydrolyzed tannins are divided into gallotanins and ellagitannins. Gallotanin can increase glucose uptake while inhibiting adipogenesis. Ellagitannin derivatives have the same properties as insulin, namely being able to increase glucose transport activity into adipose cells in vitro.

CONCLUSION

Based on this research, it was found that before being given soursop leaf tea, all respondents were in the high category. Meanwhile, after being given soursop leaf tea, it was found that the majority of respondents were in the medium category, but the respondents were in the normal category. Based on the results of the analysis using the Wilcoxon test at a significance level of $\alpha = 0.05$, it was found that $p < \alpha$ or $0.000 < 0.05$, so H_1 was accepted and

H0 was rejected, which means that there is an effect of soursop leaf tea on reducing blood sugar levels in diabetes mellitus sufferers at the Dukuh Klopo Community Health Center, Peterongan, Jombang.

SUGGESTION

Suggestions from the results of this research for respondents/community can increase knowledge about non-pharmacological treatment of diabetes mellitus using soursop leaf tea, for STIKES Husada Jombang the results of this research can be used as evidence based to develop theories and develop knowledge for readers about non-pharmacological theories that can be carried out on diabetes mellitus sufferers, for future researchers the results of this research will increase researchers' knowledge regarding non-pharmacological treatments which can be used as a reference for future researchers. For researchers, this is an experience for researchers in applying the knowledge they have gained and adding insight into the effect of soursop leaf tea on reducing blood sugar levels in diabetes mellitus.

LIMITATION

There are no limitations in carrying out this research.

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