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The effect of provision of cherry leaves booked water on the reduction of blood sugar levels in type 2 diabetes mellitus patients

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ABSTRACT

DM is a chronic condition in which there is an increase in glucose levels in the blood because the body cannot produce or produce insulin or the body cannot use insulin effectively. Based on data from the International Diabetes Federation (IDF) Organization, it is estimated that there are 463 million people aged 20-79 years in the world suffering from diabetes mellitus (DM) in 2019 or equivalent to 9.3 of the total population aged 20-79 years. According to the International Diabetes Federation (2019), there are 10.7 million DM sufferers in Indonesia. Cherry leaves can be used as a scientific alternative to non-pharmacological therapy with cherry leaf decoction to reduce blood glucose levels, because this plant contains flavonoid compounds, tannins, saponins, and alkaloids that can lower blood sugar levels. The purpose of this study was to determine the effect of boiled water on cherry leaves to reduce blood sugar levels of people with type 2 Diabetes Mellitus in the working area of the Central Tapanuli Sarudik Health Center. In this study, people who suffer from type 2 DM in the working area of the Puskesmas Sarudik Tapanuli Tengah with purposive sampling technique as many as 30 people. h DM patients where the p value is 0.000 <0.05 with a t value of 6.723 with an average value before and after being given Decoction of Cherry Leaf Water which means that there is a decrease in blood sugar levels of DM patients after being given boiled water of cherry leaves.

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INTRODUCTION

DM is a chronic condition in which there is an increase in glucose levels in the blood because the body cannot produce or produce insulin or the body cannot use insulin effectively (International Diabetes Federation, 2017). The International Diabetes Federation (IDF) organization estimates that there are 463 million people aged 20-79 years in the world suffering from diabetes mellitus (DM) in 2019, equivalent to 9.3 of the total population aged 20-79 years. According to the International

Diabetes Federation (2019) there are 10.7 million people with DM in Indonesia. The 2018 Riskesdas report shows that the prevalence of DM diagnosed by doctors in the population aged 15 years is 2%. This shows that there is an increase in DM in Indonesia compared to the results of Riskesdas 2013 which is 1.5%. Most DM sufferers are at the age of 55-64 years and 65-74 years (Fibra et al., 2021). IDF data in 2017 the number of diabetes mellitus disease until 2045 will reach 628.6 million people. Indonesia is the 6th largest region in the world with diabetes patients with a total of 10.30 million people. This number will always increase to 16.70 million people in 2045. The results of the Basic Health Research (Riskesdas, 2018) report that the number of DM sufferers in Indonesia has increased when compared to Riskesdas 2013 from 6.9% to 8.5% of the total population based on the examination of blood sugar levels. The percentage of people with diabetes mellitus in 2019 in North Sumatra was 249,519 patients and those who received health services were 144,521 patients or 57.92%. The rest as many as 104,998 did not check themselves to the health service. North Sumatra province is one of the provinces with the highest prevalence of diabetes mellitus sufferers in Indonesia, which is 2.3% (Profile of the North Sumatra Health Office in 2019).

Based on sectoral data from the Sibolga City Health Service in 2020, the number of DM sufferers in the city of Sibolga is 1,410 people. Central Tapanuli Regency itself, according to the results of the 2018 Riskesdas, showed that as many as 1782 people with diabetes of which 92.07% never went to health services, 6.88% were not treated and 7.41% did not comply with taking medication. Handling diabetes mellitus can be done through pharmacological treatment using drugs and non-pharmacological using srikaya leaves, soursop leaves, and leaves of the god crown and cherries. The use of traditional medicine is considered relatively safer than conventional medicine. Another advantage is that traditional medicine has relatively minimal side effects in ingredients whose contents are diverse and have a synergistic effect, many plants may have more than one pharmacological effect, this is more suitable for various metabolic and generative diseases. The disadvantages of traditional medicine include weak pharmacological effects, raw materials that have not been standardized, and a series of studies have not been carried out to ensure the effectiveness of therapeutic doses and their safety (Karita, 2021). Cherry leaves can be used as an alternative non-pharmacological therapy scientifically with decoction of cherry leaves and guava fruit effective for lowering blood glucose levels, because these plants contain flavonoid compounds, tannins, saponins, and alkaloids that can lower blood sugar levels. Treatment of diabetes currently requires treatment costs that are quite expensive and have side effects such as insulin injections and oral anti-diabetic drugs. Therefore, it is necessary to use medicinal plants that have anti-diabetic uses which are an alternative treatment in maintaining normal sugar levels in diabetics (Stevani et al, 2017).

Cherry leaves can be used as an alternative medicine for people with diabetes mellitus because it has active substances in the form of ascorbic acid, fiber, niacin, and beta carotene. Cherry leaves also have compounds other chemicals in the form of protein, fat, carbohydrates, ash, calcium, phosphorus, iron, tianin, riboflavin, niacin and flavonoids (flavones, flavonones, flavans, and biflavans). This leaf also has functions other than antidiabetic because flavonoid compounds can function as antimicrobial, antiviral, antioxidant, antihypertensive, stimulate the formation of estrogen, and treat impaired liver function (Zahara, 2018). In this study (journal) Norma and Hadrayanti N. (2019) in making cherry leaf steeping, the first thing to do is to take the fresh cherry leaves by manually picking the leaves from the stems. The cherry leaves that have been picked and then washed thoroughly with running water are then air-dried in the room without direct sunlight, after that the cherry leaves are then weighed to get a leaf weight of 15 grams. Cherry leaves are then boiled with 200 ml of water using a saucepan, boiled until the remaining 100 ml of water, after remaining 100 ml then strain the boiled water into a clean bottle or glass, let stand until warm and then consumed. Based on the research of Khasanah H.R. Laksono H. Dan Widelia P. W (2019) in making a decoction of cherry leaves for anti-diabetes can be done by using 100gr (10 pieces) of cherry leaves (Muntingia). Cherry is consumed twice a day in the same way every time you will

consume the decoction of the cherry leaves. The research by Fitriani, Nurlinda A. and Asrina A. (2018) made infusion of cherry leaves, namely the dose used was ten pieces of fresh green cherry leaves boiled in 200 ml of water until the boiled water turned yellow then drank one glass every day in the morning and evening. in the afternoon and taken regularly in the morning and at night before going to bed for 14 days. Based on this, it is necessary to develop research on the use of cherry leaf plants as an alternative medicine in lowering blood sugar levels in type II DM patients by boiling 100gr (ten pieces) of cherry leaves that have been washed using a measuring pan using 200cc of water until it boils and the remaining half. The decoction is taken once a day with a dose of one glass, either cold or warm for 14 days. From this description, the writer wants to know "The effect of giving cherry leaf boiled water to reducing blood sugar levels in people with Type 2 Diabetes Mellitus in the Sarudik Health Center Work Area in 2022.

RESEARCH METHOD

Research Type and Design

This type of research is a quantitative research with a one group pre-post test approach. The research design used is quasi-experimental, and the design used is one group pre-test and post-test.

Research Place and Time

This research was conducted in the working area of the Sarudik Public Health Center, Central Tapanuli Regency from Agustus to Oktober 2022.

Population and Sample

The population in this study was all people with type II DM in the Sarudik Health Center Working Area in 2022. The sample in this study used a total population of 30 respondents.

Data Collection Procedure

The collection method in this study was obtained from primary data where data was obtained from respondents through KGD measurements and secondary data obtained from puskesmas reports about DM sufferers, reference books and other related reports.

Data analysis method

Data analysis used is univariate and bivariate analysis. The data were analyzed descriptively to explain the characteristics of the variables, tabulated data was processed using the SPSS program and presented in the form of frequency and percentage and was carried out by statistical testing, the pair edit-testi test to see the effect of blood sugar levels before and after treatment.

RESULTS AND DISCUSSIONS

Results

Characteristics of Respondents

In this study, univariate analysis was conducted to determine the general characteristics of the respondents, blood sugar levels before and after consuming the cherry leaf decoction. Of the 30 respondents who suffered from tie 2 DM, as many as 60% of respondents were over 55 years old, 63.3% were female and all of them were female. respondents have suffered from DM for more than 5 years and 73.3% of respondents said there was a history of previous DM in the family.

Univariate Analysis

From the results of the univariate analysis, it is presented in the following table:

Table.1. Distribution of Respondents' Blood Sugar Levels Before and After Decoction of Cherry Leaves

		Before		After	
		Frequency	Percent	Frequency	Percent
KGD	Medium	11	36,7	17	56,7
	Bad	19	63,3	13	43,3
	Total	30	100,0	30	100,0

From the table above, it is known that blood sugar levels before being given boiled water for cherry leaves are the majority who experience high blood sugar levels (bad) as much as 63.3% with the average blood sugar level before administration of decoction of cherry leaves in patients with type II DM is 231.10 with the standard seviation 54139. Furthermore, it was found that the average blood sugar level after being given a decoction of cherry leaves in patients with type II DM was 210.43 with a standard deviation of 46,040.

Bivariate Analysis

In this study, bivariate analysis was carried out to determine the effect of blood sugar levels before and after consuming the series leaf decoction. Results of Comparison of Decrease in Blood Sugar Levels After Giving Decoction of Cherry Leaves, it was found that the comparison of blood sugar levels before being given a decoction of serial leaves in patients with type II DM was 231.10 and after being given a decoction of serial leaves in patients with Type II DM was 210.43 with a mean difference of 20,667. Statistical test results obtained a p value of 0.000 (≤0.05), which means that there is an effect of giving cherry leaf decoction in patients with Type II DM.

Discussion

Based on the results of the study, it was known that the blood sugar levels before being given boiled water of cherry leaves were the majority who experienced high blood sugar levels (bad) as much as 63.3% with an average blood sugar level before administration of cherry leaf decoction in patients with type II DM was 231.10 with the standard seviation 54139. According to the researcher's assumption, the increase in blood sugar levels is due to the respondent's lack of knowledge on how to maintain a balance of blood sugar levels by maintaining a regular diet and exercise. Eating foods that contain carbohydrates, calories and too much consumption can lead to increased blood sugar levels. In addition, the factor of work that is too busy causes a lack of regular exercise so that there is an increase in blood sugar levels of people with type II Diabetes Mellitus. Lack of knowledge to control blood sugar levels which can lead to various complications of Diabetes Mellitus. Based on the results of the study, it was found that the average blood sugar level after being given a decoction of cherry leaves showed that the average blood sugar level after being given a decoction of cherry leaves in patients with type II DM was 210.43 with a standard deviation of 46,040. According to the researcher's assumption, the flavonoid content in the leaves of the series can work by increasing glucose metabolism and converting glucose into energy. In this process, it can increase the sensitivity of cells to insulin so that glucose levels decrease. Antioxidants in Flavonoids can inhibit damage that occurs in pancreatic beta cells continuously, so that beta cells in the islets of Langerhans in the pancreas will regenerate and will secrete insulin back into the blood making it suitable for people with type II diabetes (Tuhfa, 2017).

Results of Comparison of Decrease in Blood Sugar Levels After Giving Decoction of Cherry Leaves, it was found that the comparison of blood sugar levels before being given a decoction of serial leaves in patients with type II DM was 231.10 and after being given a decoction of serial leaves in patients with Type II DM was 210.43 with a mean difference of 20,667. the results of the statistical test obtained a p value of 0.000 (≤0.05) which means that there is an effect of giving a decoction of cherry leaves to patients with Type II DM in the Work Area of the Sarudik Health Center, Central Tapanuli Regency in 2022 According to the researcher's assumption, the flavonoids contained in the seri leaves work to activate glycogen synthesis. increase glucose transport and

activate insulin receptor kinase so that it can reduce blood sugar levels. Compounds from the flavonoid group in the form of flavonols are thought to have activity in lowering blood glucose levels, namely quercetin. The mechanism of action of quercetin works by keeping pancreatic cells working normally (Norma and Nur, 2018). This research is in line with what Christian (2020) did, with the title of using cherry leaves (Muntigia Calabura L.) in the treatment of diabetes mellitus, there was a decrease which showed the results of respondents who had diabetes mellitus (high blood sugar levels) as many as 13 respondents, with the results before and after consuming the boiled water of cherry leaves, which is equal to 305.58 mg/dl to 178.33 mg/dl where there is a significant effect in giving cherry leaves to reduce blood glucose levels.

Another study was also conducted by Rahman, et al (2020) with the title of the effect of boiled water on cherry leaves on blood sugar levels in type 2 diabetes mellitus patients at the Tanjungpinag City Health Center, there was a decrease which showed that from 17 respondents the administration of boiled water of cherry leaves was 100% or All respondents had high blood sugar levels and after being given boiled water, the cherry leaves showed a decrease of 58.8% in the medium category. Another study also conducted by Rahman et al (2020) with the title Lowering Blood Sugar Levels With Kersen Leaf Stew (Muntigia Carabula Lam), there was a decrease which showed that of the 32 respondents who were given 100 % of cherry leaf boiled water or all respondents had sugar levels. high blood pressure and after being given boiled water from cherry leaves, the results decreased to 36.5 mg/dl and effectively reduced blood sugar levels. The results of this study are also in line with the research of Porina, et al in 2020 with the title The Effect of Giving Decoction of Kersen Leaves (Muntingia Calabura L) on Blood Sugar Levels of Type II Diabetes Mellitus Patients which showed the majority of respondents before being given an intervention were 63.6%, after being given an intervention 90 ,9%. There was an effect of giving boiled cherry leaves on decreasing blood sugar levels (p = 0.009). Cherry leaves contain saponins and flavonoids that can inhibit the absorption of blood sugar from the intestine, so that carbohydrates are not absorbed by the intestines. Decoction of cherry leaves is proven to reduce blood sugar levels and can be used as herbal medicine for people with DM. This research is also in line with the Siringoringo study, 2021 on the Effect of Decoction of Kersen Leaves on Blood Glucose Levels in Type 2 Diabetes Mellitus Patients in the Work Area of the Public Health Center. Bontobahari, The results of the analysis using the statistical test of unpaired T test obtained p value = 0.000 (p 0.05), which means Ho is rejected and Ha is accepted.

CONCLUSION

Based on the results of the study, it can be concluded that the results of the comparison of decreasing blood sugar levels before and after giving the decoction of cherry leaves showed that the comparison of blood sugar levels before being given a decoction of serial leaves in patients with type II DM was 231.10 and after being given a decoction of seri leaves in patients with type II diabetes was 210.43 with a mean difference of 20,667. Statistical test results obtained p value 0.000 (≤0.05) which means that there is an effect of giving cherry leaf decoction in patients with Type II DM. The decrease in high blood sugar levels in patients with type II DM can be reduced by the presence of flavonoid compounds where flavonoids in nature are water-soluble compounds so that the antioxidants in flavonoids can inhibit the damage that occurs to pancreatic beta cells continuously, so that beta cells in the pancreas will regenerate and secrete insulin back into the blood making it suitable for people with blood sugar levels.

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