THE IMPACT OF ADMINISTERING CINNAMON INFUSIONS ON LOWERING BLOOD GLUCOSE LEVELS IN DIABETES MELLITUS PATIENTS IN THE SERVICE AREA OF KUTA BARO HEALTH CENTER, ACEH BESAR DISTRICT

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Abstract

Diabetes mellitus is a chronic disease characterized by elevated blood glucose levels and often accompanied by complications. Complications that occur in diabetes mellitus patients include blurred vision, cataracts, diabetic retinopathy, kidney damage, frequent loss of pain sensation, potential gangrene formation, and amputation to prevent the spread of gangrene to other tissues. The management of diabetes mellitus can be done pharmacologically through the administration of anti-diabetes medications, insulin injections, and non-pharmacological approaches such as cinnamon tea infusion. The research objective is to determine the effect of cinnamon tea infusion on reducing blood sugar levels in diabetes mellitus patients in the Kuta Baro Primary Health Center, Aceh Besar District in 2023. This research used a quasi-experimental design with a sample size of 20 diabetes mellitus patients, selected through purposive sampling. The study was conducted from December 28, 2022, to January 5, 2023, and data analysis included univariate and bivariate analysis. The results showed that before the administration of cinnamon tea infusion, the average blood sugar level was 255.80, while after the administration of cinnamon tea infusion, the average level was 193.05, with an average decrease in blood sugar levels of 41.33. This indicates a significant difference in blood sugar levels before and after the administration of cinnamon tea infusion with a p-value of 0.001, suggesting that cinnamon tea infusion has an effect on blood sugar levels. It is expected that healthcare professionals will improve healthcare services and promote the use of cinnamon tea infusion among the community, especially diabetes mellitus patients.

Keywords: Blood Sugar Level, Cinnamon Tea Infusion, Diabetes Mellitus

1. INTRODUCTION

The term "diabetes mellitus" is derived from Latin, originating from the Greek words "diabetes," which means a siphon, and "mellitus," which means honey. The term "siphon of honey" is related to the condition of patients who excrete a large amount of urine with a high sugar content. In Indonesia, this condition is known as "*kencing manis*" or sweet urine. From a scientific perspective, diabetes mellitus is a metabolic disorder of glucose due to a deficiency or decreased effectiveness of insulin. Insulin is a hormone that plays a role in glucose metabolism and is secreted by cells in the pancreas (Muhith & Siyoto, 2016).

Diabetes mellitus is a chronic disease characterized by an increase in blood glucose levels and is always accompanied by complications. Complications resulting from diabetes mellitus are a major health problem in society. Complications of diabetes mellitus include diabetic retinopathy, nephropathy, and diabetic neuropathy. According to the World Health Organization (WHO) in 2021, the prevalence of diabetes mellitus worldwide was 422 million people, with the majority residing in low- and middle-income

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countries, and 1.5 million direct deaths were attributed to diabetes mellitus each year (Riskesdas, 2014).

In Indonesia, the prevalence of diabetes mellitus in 2013, based on blood tests in individuals aged 15 and over, was 6.9%, and it increased to 8.5% in 2018. Meanwhile, based on doctor's diagnoses in 2013, the prevalence of diabetes mellitus patients was 1.5%, and in 2018, it was 2.0%. Aceh Province ranked seventh highest with a prevalence of 1.68% (Riskesdas, 2014).

The management of diabetes mellitus can be done pharmacologically, including the administration of anti-diabetes drugs and insulin injections, and non-pharmacologically, such as the use of cinnamon tea infusion. Cinnamon is one of the spices found in Indonesia and is used as a traditional remedy. Cinnamon has a sweet and fragrant aroma, it is warm, has a slightly spicy taste, and is somewhat sweet. Cinnamon contains essential oils such as eugenol and polyphenols, which help improve insulin receptor proteins in cells, thus increasing insulin sensitivity and regulating blood glucose levels, which can aid in the treatment of diabetes mellitus (Ramadhan et al., 2018).

From the data obtained by the researcher from the Kuta Baro Community Health Center in Aceh Besar Regency in 2021, the number of diabetes mellitus patients in the Kuta Baro Community Health Center's working area is 519 individuals. The number of diabetes mellitus patients in the Kuta Baro Community Health Center's working area from January to March 2022 is 532 individuals (Hans, 2018). Hence, the study objective is to evaluate the effect of cinnamon tea infusion on reducing blood sugar levels in diabetes mellitus patients in the Kuta Baro Community Health Center's working area in 2023.

2. RESEARCH METHOD

This research is categorized as quasi-experimental and follows a one-group pretest-posttest design, involving the application of a treatment and two observations on a single group of participants. The sample consists of 20 individuals diagnosed with diabetes mellitus, selected through purposive sampling. The study was conducted from December 28, 2022, to January 5, 2023, and data analysis encompassed both univariate and bivariate approaches.

This study entails applying a treatment and conducting two observations within a single group of participants. The sample comprised 20 individuals diagnosed with diabetes mellitus, chosen via purposive sampling. Data collection occurred between December 28, 2022, and January 5, 2023, and the data analysis encompassed both univariate and bivariate methods, enabling a comprehensive examination of the effects of cinnamon tea on blood sugar levels in individuals with diabetes mellitus.

3. RESULT AND DISCUSSION
3.1. Result

Based on table 1 below, it can be seen that of the 20 respondents aged ≥ 60 years, 12 respondents (60%), 13 respondents (65%) had a high school education, 11 respondents (55%) did not work, and the male and female sexes were 10 respondents each (50%).

Table 1. Frequency Distribution of Respondent Characteristics

No	Age of Mother	Frequency	Percentage (%)
1	<60 years old	8	40
	≥ 60 years old	12	60
	Total	**20**	**100**
No	**Education**	**Frequency**	**Percentage (%)**
2	Junior High School	2	10
	Senior High School	13	65
	College	5	25
	Total	**20**	**100**
No	**Job**	**Frequency**	**Percentage (%)**
3	Working	9	45
	Unemployed	11	55
	Total	**20**	**100**
No	**Gender**	**Frequency**	**Percentage (%)**
4	Male	10	50
	Female	10	50
	Total	**20**	**100**

3.1.1. Univariate Analysis

a. Blood Sugar Levels Before Giving Cinnamon Water Seduction

Table 2. Frequency Distribution of Respondents Based on Blood Sugar Levels Before Giving Cinnamon Water Sedation

No	Blood Sugar (mg/dl)	Frequency	Percentage
1	200 – 250	9	45 %
2	251 – 300	6	30 %
3	301 – 350	5	25 %
	Total	**20**	**100**

Based on table 2, it can be seen that of the 20 respondents before giving cinnamon water brew, the category of blood sugar levels 200-250 mg/dl was 9 respondents (45%).

b. Blood Sugar Levels After Giving Cinnamon Water Seduction

Table 3. Frequency Distribution of Respondents Based on Blood Sugar Levels After Giving Cinnamon Water Sedation

No	Blood Sugar (mg/dl)	Frequency	Percentage
1	100 – 150	3	15 %
2	151 – 200	12	60 %
3	201 – 250	1	5 %
4	251 – 300	4	20 %
	Total	20	100

Based on table 3, it can be seen that out of 20 respondents after giving cinnamon water brew, the category of blood sugar levels 151-200 mg/dl was 12 respondents (60%).

3.1.2. Bivariate Analysis
a. Normality Test Results

Table 4. Normality Test Results (Shapiro Wilk Test)

Group	Shapiro-Wilk		P Value
	Statistic	**df**	
Pretest	0,920	20	0,100
Post test	0,933	20	0,170

Based on table 4, it can be seen that the results of the normality test of blood sugar levels at pretest are normally distributed (p 0.100>0.05) and at posttest are also normally distributed (p 0.170>0.05), so paired T-test can be used.

b. The Effect of Giving Cinnamon Water Seduction on Blood Sugar Levels in Patients with Diabetes Mellitus

**Table 5. Effect of Giving Cinnamon Water Seduction
on Blood Sugar Levels in Patients with Diabetes Mellitus**

No	Group	Mean	Average difference	P Value
1	Pretest	255,80	41,33	0,001
2	Post test	193,05		

Based on Table 5, it is evident that prior to the administration of cinnamon water, the average blood sugar level was 255.80. Subsequently, following the consumption of cinnamon water, the average blood sugar level decreased to 193.05, indicating an average reduction in blood sugar levels of 41.33. This suggests a significant difference in blood sugar levels before and after cinnamon water intake, with a p-value of 0.001, confirming the impact of cinnamon water on blood sugar levels.

4.2. Discussion
The research results show that before the administration of cinnamon water, the average blood sugar level was 255.80. After the administration of cinnamon water, the average blood sugar level was 193.05, with an average decrease in blood sugar levels of 41.33. This indicates a significant difference in blood sugar levels before and after the administration of cinnamon water, with a p-value of 0.001, suggesting that cinnamon water has an impact on blood sugar levels.

These findings are supported by previous research conducted by Novendy, which demonstrated that there is an effect of cinnamon extract on blood glucose levels after intervention with cinnamon powder infusion at a dose of 6 grams mixed with 100 ml of water. The average decrease in blood glucose levels before the intervention was 10, which

decreased to 2 after the intervention, with a p-value of 0.002. Similarly, Suwanto, Qomariah, and Nurdianah conducted research showing that there is an effect of cinnamon extract on blood glucose levels after intervention with cinnamon powder infusion at a dose of 10 grams for 14 days. The average decrease in blood glucose levels before the intervention was 142.71, which decreased to 113.67 after the intervention, with a p-value of 0.001 (Yuli Aspiani, 2018).

The management of diabetes mellitus can be carried out pharmacologically with the administration of anti-diabetic drugs and insulin injections. Additionally, non-pharmacological interventions, such as the administration of cinnamon water, can also be effective. Cinnamon is a spice commonly found in Indonesia and is used as a traditional remedy. It contains essential oils such as eugenol and polyphenols, which help enhance insulin receptor protein on cells, thereby improving insulin sensitivity and blood glucose regulation, contributing to the treatment of diabetes mellitus (Gusti, 2018).

Cinnamon is beneficial in controlling blood sugar levels in diabetic patients due to its flavonoid content, which functions as an anti-hyperglycemic agent. Flavonoids have a similar activity to insulin in increasing insulin receptor protein on cells, thereby enhancing insulin sensitivity and reducing blood glucose levels closer to normal. Due to these active ingredients, cinnamon can be processed into a substance that helps lower blood glucose levels in diabetes mellitus patients and can be used in the long term (Basuki, 2018).

According to the researcher's assumption, the administration of cinnamon water has an impact on blood sugar levels. This is attributed to the fact that respondents who were given cinnamon water twice a day for seven days experienced a decrease in blood sugar levels. The decrease in blood sugar levels occurred because the respondents followed the instructions without missing a single day, and also because cinnamon has a high polyphenol content and anti-hyperglycemic effects, leading to a direct increase in insulin productivity. As a result, with increased insulin levels, blood sugar levels decreased closer to normal among the respondents.

4. CONCLUSION

The findings of this study demonstrate a significant decrease in blood sugar levels among diabetic patients after the administration of cinnamon water. The average blood sugar level decreased from 255.80 before the intervention to 193.05 after the intervention, with a substantial average decrease of 41.33. The statistical analysis indicated a significant difference with a p-value of 0.001, supporting the notion that cinnamon water has a positive influence on blood sugar levels in diabetic individuals.

Based on these results, it is recommended that cinnamon water be considered as a complementary intervention for managing blood sugar levels in diabetic patients. This non-pharmacological approach offers a safe and cost-effective method to help regulate blood glucose. However, further research with larger sample sizes and longer observation periods is warranted to validate and extend these findings. Additionally, healthcare providers should include counseling and education on the proper use and dosage of cinnamon water in the management of diabetes mellitus to ensure its optimal benefits for patients. The potential benefits of cinnamon water in glycemic control offer a promising

avenue for diabetes management, contributing to improved quality of life for individuals living with this chronic condition.

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