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The Effect of Combined Cinnamon and Ginger Decoction on Fasting Blood Glucose Levels among Patients with Diabetes Mellitus in RT 02 RW 04 Kampung Sukamanah, Parung Panjang, Bogor

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Abstract: Diabetes mellitus is a chronic metabolic disease that requires continuous management to prevent complications and improve patients' quality of life. In community settings, several patients still experience uncontrolled blood glucose levels due to limited awareness, lifestyle factors, and inconsistent treatment adherence. Cinnamon and ginger are herbal ingredients that contain bioactive compounds and are commonly used as complementary approaches to support blood glucose management. **Objective:** This study aimed to examine the effect of a combination of cinnamon and ginger decoction on reducing fasting blood glucose levels among patients with diabetes mellitus in RT 02 RW 04 Kampung Sukamanah, Parung Panjang, Bogor. **Methods:** This study used a quantitative quasi-experimental design with a pretest–posttest without control group approach. A total of 18 respondents with diabetes mellitus were selected using purposive sampling based on predetermined inclusion criteria. Fasting blood glucose levels were measured before and after the administration of cinnamon and ginger decoction. Data were analyzed using univariate analysis and a paired sample t-test to determine differences in blood glucose levels before and after the intervention. **Findings:** The results showed that the mean fasting blood glucose level before the intervention was 373.72 mg/dL, while the mean level after the intervention decreased to 182.89 mg/dL. Statistical analysis showed a significant difference between pre-test and post-test blood glucose levels, with a p-value of 0.001. These findings indicate that the administration of cinnamon and ginger decoction was associated with a reduction in fasting blood glucose levels among the respondents. **Implication:** The findings suggest that cinnamon and ginger decoction may be considered as an affordable and accessible complementary non-pharmacological approach to support community-based diabetes management. However, this intervention should not replace standard medical treatment. **Originality:** This study provides empirical evidence on the combined use of cinnamon and ginger decoction in a community-based setting, particularly among patients with diabetes mellitus in RT 02 RW 04 Kampung Sukamanah, Parung Panjang, Bogor.

Keywords: cinnamon; diabetes mellitus; fasting blood glucose; ginger; herbal decoction

INTRODUCTION

Diabetes mellitus is a chronic metabolic disease characterized by elevated blood glucose levels caused by impaired insulin secretion, insulin action, or both. This disease has become a crucial global public health problem because persistent hyperglycemia may

lead to serious complications, including cardiovascular disease, kidney failure, neuropathy, visual impairment, stroke, and lower limb amputation. The World Health Organization reported that the number of people living with diabetes increased from approximately 200 million in 1990 to 830 million in 2022, with a faster increase occurring in low- and middle-income countries. In Indonesia, the International Diabetes Federation reported that approximately 20.4 million adults aged 20–79 years were living with diabetes in 2024, placing Indonesia among the countries with the highest diabetes burden worldwide (International Diabetes, 2024; World Health, 2024).

The increasing prevalence of diabetes mellitus creates health, social, and economic burdens for individuals, families, communities, and healthcare systems. At the community level, diabetes management remains challenging because many patients still experience uncontrolled blood glucose levels due to limited awareness, unhealthy dietary patterns, inadequate physical activity, and inconsistent treatment adherence. A preliminary study conducted in RT 02 RW 04 Kampung Sukamanah, Parung Panjang, Bogor, showed that several residents with diabetes mellitus still had elevated blood glucose levels. Interviews with residents indicated that some patients consumed antidiabetic medication regularly, some used medication only when symptoms appeared, and others were unaware of their elevated blood glucose levels. These conditions indicate the need for accessible community-based approaches to support diabetes management, particularly through health education and safe complementary non-pharmacological interventions.

Previous studies on diabetes management can be categorized into three main areas. The first category focuses on standard diabetes management, including pharmacological therapy, dietary regulation, physical activity, weight management, blood glucose monitoring, and patient education. The American Diabetes Association emphasizes that diabetes care requires continuous, individualized, and evidence-based management to achieve glycemic control and prevent complications (American Diabetes Association Professional Practice, 2024). Pharmacological approaches such as oral antidiabetic drugs and insulin remain essential in diabetes care, but lifestyle modification and self-management education are also important components of long-term glycemic control. However, in community settings, barriers such as cost, fear of long-term medication use, low health literacy, and limited access to healthcare services may influence patients' adherence to standard treatment.

The second category of literature discusses the potential role of cinnamon as a complementary intervention for glycemic control. Cinnamon contains bioactive compounds such as cinnamaldehyde and polyphenols, which may contribute to insulin sensitivity, glucose metabolism, antioxidant activity, and reduced insulin resistance. An umbrella meta-analysis by (Zarezadeh et al., 2023), reported that cinnamon supplementation was associated with reductions in fasting plasma glucose, insulin, HOMA-IR, and HbA1c among patients with type 2 diabetes or polycystic ovary syndrome. Similarly, (Moridpour et al., 2024) conducted an updated systematic review and dose-response meta-analysis of randomized controlled trials and found that cinnamon supplementation may improve glycemic control in patients with type 2 diabetes mellitus. Nevertheless, previous findings remain varied across studies because of differences in cinnamon type, dosage, duration, preparation form, and participant characteristics.

The third category of literature examines ginger and the combined use of herbal ingredients in diabetes management. Ginger contains gingerol, shogaol, flavonoids, and phenolic compounds that are associated with antioxidant and anti-inflammatory activities and may influence glucose metabolism. (Mao et al., 2019) described ginger as a plant rich in bioactive compounds with multiple biological activities, while (Mohammad et al., 2021) reported that ginger supplementation may influence inflammatory parameters in patients with type 2 diabetes. However, a recent systematic review and meta-analysis by (Schumacher et al., 2024) found mixed evidence regarding the effect of oral ginger supplementation on fasting blood glucose and HbA1c, indicating that further studies are still needed. In addition, experimental studies have suggested that the combined administration of ginger and cinnamon may have hypoglycemic and antioxidant effects in diabetic models (Ayuob et al., 2021). However, studies examining the combination of cinnamon and ginger decoction in human community-based settings remain limited, particularly in RT 02 RW 04 Kampung Sukamanah, Parung Panjang, Bogor.

Based on this research gap, the present study aimed to examine the effect of a combination of cinnamon and ginger decoction on reducing fasting blood glucose levels among patients with diabetes mellitus in RT 02 RW 04 Kampung Sukamanah, Parung Panjang, Bogor. This study was designed to provide empirical evidence regarding whether the administration of cinnamon and ginger decoction is associated with changes in fasting blood glucose levels after the intervention. The findings are expected to contribute to community-based diabetes management by providing information on an affordable and

accessible complementary approach that may support, but not replace, standard medical treatment.

The main argument of this study is that the combination of cinnamon and ginger decoction may contribute to a reduction in fasting blood glucose levels among patients with diabetes mellitus. This argument is based on the potential biological activities of cinnamon and ginger, including their roles in supporting insulin sensitivity, improving glucose metabolism, and reducing oxidative stress and inflammation. Therefore, the hypothesis proposed in this study is that there is a significant difference in fasting blood glucose levels before and after the administration of cinnamon and ginger decoction among patients with diabetes mellitus in RT 02 RW 04 Kampung Sukamanah, Parung Panjang, Bogor.

RESEARCH METHOD

Research Design

This study employed a quantitative research approach using a quasi-experimental method with a pretest–posttest without control group design. According to (Sugiyono, 2022), quasi-experimental research is conducted to examine the effect of a particular treatment on the observed variables through intervention and outcome measurement. In this design, the researcher administered an intervention to a single group of respondents and compared blood glucose levels before and after the intervention.

The pretest–posttest without control group design allows researchers to evaluate the effectiveness of treatment by comparing the pre-intervention and post-intervention outcomes (Dharma, 2017). In this study, respondents with diabetes mellitus received a combination of cinnamon and ginger decoction, and fasting blood glucose levels were measured before and after the intervention. The research design can be illustrated as follows:

O1 → X→O2

Where:

- O_1= Pretest before intervention
- X= Administration of cinnamon and ginger decoction
- O_2= Posttest after intervention

Population and Sample

Population

According to (Azhari et al., 2023), population refers to all individuals or units that possess specific characteristics relevant to the research objectives. The population of this study consisted of all diabetes mellitus patients residing in RT 02 RW 04 Kampung Sukamanah, Parung Panjang, Bogor, totaling 58 individuals.

Sample

A sample is a subset of the population that represents the characteristics of the target population. Sampling enables researchers to conduct research more efficiently in terms of time, cost, and effort (Saparina, 2023). The sample size in this study was determined using the Federer formula, resulting in 18 respondents.

The Federer formula is expressed as follows:

$$(\boldsymbol{t-1})(\boldsymbol{n-1}) > \mathbf{15}$$

Where:

- t= number of treatment groups
- n= number of samples

The calculation process was conducted as follows:

$$(2-1)(n-1) > 15$$
$$(1)(n-1) > 15$$
$$n-1 > 15$$
$$n = 16$$

To anticipate participant dropout, an additional 10% was added:

$$10\% \times 16 = 1.6$$
$$16 + 1.6 = 17.6 \approx 18$$

Therefore, the final sample size consisted of 18 respondents.

Sampling Technique

This study used purposive sampling as the sampling technique. According to (Sugiyono, 2022), sampling is a method used to select participants from a larger population. Purposive sampling is a technique in which respondents are selected based on predetermined inclusion criteria relevant to the study objectives.

Inclusion Criteria

The inclusion criteria in this study were:

1. Patients with diabetes mellitus who were willing to participate as respondents.
2. Patients who were not consuming antidiabetic medication.
3. Patients with fasting blood glucose levels ≥ 126 mg/dL.

Exclusion Criteria

The exclusion criteria included:

1. Patients with diabetic complications.
2. Patients with digestive disorders.
3. Patients with allergies to cinnamon or ginger.

Research Setting and Time

This study was conducted in RT 02 RW 04 Kampung Sukamanah, Parung Panjang, Bogor. The location was selected because many residents experienced diabetes mellitus, yet limited knowledge regarding non-pharmacological therapies such as cinnamon and ginger decoction was observed. Furthermore, no previous study regarding the combination of cinnamon and ginger decoction had been conducted in this area. The research was conducted from April to July 2025, including preliminary surveys, data collection, intervention implementation, and report preparation**.**

Research Ethics

This study adhered to ethical principles proposed by (Notoatmodjo, 2018) including respect for human dignity, privacy and confidentiality, justice and inclusiveness, and balancing benefits and harms. Respondents received explanations regarding the objectives, procedures, benefits, and potential risks of the study before signing informed consent forms. Confidentiality of respondent identity was maintained throughout the study.

Research Instruments

According to (Notoatmodjo, 2018) research instruments are tools used to collect data required in a study. The instruments used in this research included questionnaires for respondent characteristics and observation sheets for blood glucose measurements. The tools used for blood glucose measurement included:

1. Glucometer
2. 28G lancet
3. Alcohol swab
4. Gloves
5. Observation sheet

The tools and materials used to prepare the cinnamon and ginger decoction included:

1. 50 grams of cinnamon
2. 40 grams of ginger
3. Measuring cup
4. Digital scale
5. Food thermometer
6. Stove
7. Knife
8. Cutting board
9. Cooking pot

Data Collection Procedure

Administrative Procedure

The researcher first obtained approval from the academic supervisor and research permission from STIKes Pertamedika. Subsequently, permission was requested from the head of RT 02 RW 04 Kampung Sukamanah, Parung Panjang, Bogor before conducting data collection.

Technical Procedure

The researcher explained the objectives and procedures of the study to respondents and community health cadres. Two research assistants with nursing educational backgrounds assisted in data recording and documentation. Fasting blood glucose levels were measured before intervention. Respondents then received 200 ml of cinnamon and ginger decoction once daily in the morning before meals for one week. Posttest blood glucose measurements were conducted after the intervention period.

Data Processing

Data processing was conducted using computerized statistical analysis following the stages proposed by (Notoatmodjo, 2018) including editing, coding, data entry, and data cleaning to ensure data completeness and accuracy.

Data Analysis

Normality Test

Normality testing was conducted to determine whether the data were normally distributed before selecting the appropriate statistical test. Skewness analysis can be used to evaluate data normality. Data are considered normally distributed if the skewness ratio lies between −1.96 and +1.96.

The skewness formula is as follows:

$$\boldsymbol{Sk = \frac{\bar{X} - Mo}{S}}$$

Where:

- Sk= Skewness coefficient
- $\bar{X}$= Mean
- Mo= Mode
- S= Standard deviation

Univariate Analysis

Univariate analysis was used to describe the characteristics and distribution of variables in the study (Notoatmodjo, 2018). Descriptive statistical measures included frequency distribution, mean, median, and standard deviation. The frequency distribution formula is presented as follows:

$$\boldsymbol{P = \frac{f}{N} \times 100\%}$$

Where:

- P= Percentage
- f= Frequency
- N= Total respondents

The mean formula used in this study was:

$$\boldsymbol{\bar{X} = \frac{\sum X}{n}}$$

Where:

- $\bar{X}$= Mean
- $\sum X$= Total score
- n= Number of observations

Bivariate Analysis

Bivariate analysis was conducted to determine the effect of cinnamon and ginger decoction on blood glucose reduction among diabetic patients. According to (Notoatmodjo, 2018)), bivariate analysis examines the relationship between independent and dependent variables.

Since the data were normally distributed, the paired sample t-test was used to compare pretest and posttest blood glucose levels. According to Adiputra, the paired t-test is applied to compare the mean difference between two related measurements.

The paired t-test formula is as follows:

$$t = \frac{\bar{d}}{SD_d/\sqrt{n}}$$

Where:

- $\bar{d}$= Mean difference between pretest and posttest
- SD_d= Standard deviation of the differences
- n= Number of samples

The level of significance used in this study was 0.05. The decision criteria were as follows:

a. If $p < 0.05$, $H_0$was rejected, indicating that cinnamon and ginger decoction significantly reduced blood glucose levels.
b. If $p > 0.05$, $H_0$was accepted, indicating that the intervention had no significant effect on blood glucose reduction.

RESULT

Univariate Analysis

Univariate analysis in this study was conducted to identify the frequency distribution of respondent characteristics and the distribution of blood glucose levels before and after respondents received the cinnamon and ginger decoction intervention.

1. Characteristics of Respondents

Frequency Distribution Based on Respondents' Age in the Intervention Group

Table 1. Frequency Distribution Based on Respondents' Age in RT 02 RW 04 Kampung Sukamanah, Parung Panjang, Bogor, 2025 (n = 18)

No	Age Category	Frequency	Percentage (%)
1	Early Adulthood	2	11.1

No	Age Category	Frequency	Percentage (%)
2	Middle Adulthood	11	61.1
3	Elderly	5	27.8
	Total	18	100

Based on Table 1, the characteristics of respondents in RT 02 RW 04 Kampung Sukamanah, Parung Panjang, Bogor showed that most respondents were in the middle adulthood category, totaling 11 respondents (61.1%), followed by elderly respondents with 5 respondents (27.8%), and early adulthood respondents with 2 respondents (11.1%).

2. Frequency Distribution Based on Respondents' Gender in the Intervention Group

Table 2. Frequency Distribution Based on Respondents' Gender in RT 02 RW 04 Kampung Sukamanah, Parung Panjang, Bogor, 2025 (n = 18)

No	Gender	Frequency	Percentage (%)
1	Male	3	16.7
2	Female	15	83.3
	Total	18	100

Based on Table 2, the characteristics of respondents in RT 02 RW 04 Kampung Sukamanah, Parung Panjang, Bogor indicated that the majority of respondents were female, accounting for 15 respondents (83.3%), while male respondents accounted for 3 respondents (16.7%).

3. Mean Blood Glucose Level Before the Administration of Cinnamon and Ginger Decoction Intervention

Table 3. Mean Blood Glucose Level Before the Administration of Cinnamon and Ginger Decoction Intervention in RT 02 RW 04 Kampung Sukamanah, Bogor, 2025 (n = 18)

Variable	Mean	SD	Min	Max
Pre-test (mg/dL)	373.72	96.755	203	485

Based on Table 3, before the administration of the cinnamon and ginger decoction intervention, the mean fasting blood glucose level was 373.72 mg/dL, with a minimum value of 203 mg/dL, a maximum value of 485 mg/dL, and a standard deviation of 96.755

4. Mean Blood Glucose Level After the Administration of Cinnamon and Ginger Decoction Intervention

Table 4. Mean Blood Glucose Level After the Administration of Cinnamon and Ginger Decoction Intervention in RT 02 RW 04 Kampung Sukamanah, Bogor, 2025 (n = 18)

Variable	Mean	SD	Min	Max
Post-test (mg/dL)	182.89	16.257	99	300

Based on Table 4, after the intervention, the mean fasting blood glucose level decreased to 182.89 mg/dL, with a minimum value of 99 mg/dL, a maximum value of 300 mg/dL, and a standard deviation of 16.257.

5. Difference in the Mean Reduction of Blood Glucose Levels Before and After the Intervention

Table 5. Difference in Mean Blood Glucose Levels Before and After the Intervention in RT 02 RW 04 Kampung Sukamanah, Bogor, 2025 (n = 18)

Variable	Mean	SD	Min	Max
Pre-test (mg/dL)	373.72	96.755	203	485
Post-test (mg/dL)	182.89	16.257	99	300

Table 5. demonstrates a difference in the mean blood glucose levels before and after the administration of the cinnamon and ginger decoction intervention. The mean blood glucose level before the intervention was 373.72 mg/dL, while after the intervention it decreased to 182.89 mg/dL. These findings indicate that blood glucose levels declined following the administration of the cinnamon and ginger decoction intervention.

6. Analysis of the Effect of Cinnamon and Ginger Decoction Administration

Table 6. Difference in Blood Glucose Levels Before (Pre-test) and After (Post-test) the Administration of Cinnamon and Ginger Decoction in RT 02 RW 04 Kampung Sukamanah, Bogor, 2025 (n = 18)

Blood Glucose Level	Mean	Difference
Pre-test	373.72	190.83
Post-test	182.89	

Table 5 and 6 shows the difference in blood glucose levels before and after the administration of cinnamon and ginger decoction among respondents in RT 02 RW 04 Kampung Sukamanah, Parung Panjang, Bogor. After receiving the intervention for five days, respondents experienced a reduction in blood glucose levels of 190.83 mg/dL. These findings indicate that the administration of cinnamon and ginger decoction contributed to a decrease in blood glucose levels among patients with diabetes mellitus.

Bivariate Analysis

Bivariate analysis was conducted to determine the direct effect between the independent variable and the dependent variable. In this study, bivariate analysis was used to examine the effect of administering a combination of cinnamon and ginger decoction on reducing blood glucose levels among patients with diabetes mellitus.

To determine the effect of the combination of cinnamon and ginger decoction on blood glucose reduction among patients with diabetes mellitus, the Dependent t-test (Paired t-test) was applied. The criteria for statistical significance were determined as follows: a significant effect was identified if the p-value ≤ 0.05, whereas no significant effect was identified if the p-value ≥ 0.05.

Table 7. Analysis of the Effect of Cinnamon and Ginger Decoction Administration Before (Pre-test) and After (Post-test) Intervention in RT 02 RW 04 Kampung Sukamanah, Bogor, 2025 (n = 18)

Fasting Blood Glucose	Mean	SD	SE	P-Value
Pre-test	373.72	96.775	22.805	0.001
Post-test	182.89	68.974	16.257	

Based on Table 7, the administration of the combination of cinnamon and ginger decoction showed a significant reduction in fasting blood glucose levels among respondents. The mean blood glucose level before the intervention was 373.72 mg/dL, whereas the mean blood glucose level after the intervention decreased to 182.89 mg/dL. The standard deviation of blood glucose levels before the intervention was 96.775 mg/dL, while after the intervention it decreased to 68.974 mg/dL. The statistical analysis using the paired t-test demonstrated a significant effect of the intervention on blood glucose reduction, with a p-value of 0.001 ($p < 0.05$).

These findings indicate that the administration of cinnamon and ginger decoction had a statistically significant effect on reducing blood glucose levels among patients with diabetes mellitus.

DISCUSSION

Univariate Analysis

The findings of this study demonstrated that most respondents were in the middle adulthood age group, followed by elderly respondents. This condition indicates that diabetes mellitus is more commonly experienced by individuals in middle and older adulthood. Increasing age is closely associated with physiological changes in glucose metabolism and insulin sensitivity. Aging contributes to decreased pancreatic function and reduced insulin effectiveness, thereby increasing the risk of diabetes mellitus. The decline in metabolic function among older adults may result in impaired blood glucose regulation and prolonged hyperglycemia. These findings are also consistent with the study conducted by (Siswandi et al., 2020) which reported that adult and elderly patients were more likely to experience unstable blood glucose levels due to reduced metabolic efficiency.

The gender distribution in this study showed that the majority of respondents were female. This finding suggests that women may have a greater vulnerability to diabetes mellitus compared to men. Hormonal fluctuations in women, particularly during adulthood and old age, can influence insulin sensitivity and glucose metabolism. In addition, women generally have a higher tendency to accumulate abdominal fat, which is associated with insulin resistance and an increased risk of diabetes mellitus. Lifestyle factors such as dietary habits, low physical activity, and excessive consumption of sugary foods and beverages may further contribute to this condition. The findings are in line with the study conducted by (Permana et al., 2024) which stated that women are more likely to develop diabetes mellitus due to both biological and lifestyle-related factors.

The results of this study also showed that the mean fasting blood glucose level before the intervention was relatively high. This condition reflects poor blood glucose control among respondents prior to receiving the cinnamon and ginger decoction intervention. Elevated blood glucose levels in diabetes mellitus are commonly caused by impaired insulin production or insulin resistance, resulting in reduced glucose uptake by body cells. According to (Nurjannah et al., 2018), self-care plays an important role in controlling fasting blood glucose levels among patients with type 2 diabetes mellitus. The high baseline

blood glucose levels observed in this study may also have been influenced by unhealthy dietary patterns, irregular eating schedules, and limited awareness regarding diabetes management.

After the administration of the cinnamon and ginger decoction intervention, the mean blood glucose level decreased substantially. This finding indicates that the combination of cinnamon and ginger may contribute positively to blood glucose regulation among diabetes mellitus patients. Cinnamon contains cinnamaldehyde and polyphenolic compounds that are known to improve insulin sensitivity and reduce insulin resistance. Cinnamon may also delay gastric emptying and inhibit carbohydrate digestion, thereby reducing postprandial glucose spikes. Meanwhile, ginger contains active compounds such as gingerol and shogaol, which play important roles in enhancing glucose uptake into body cells and reducing inflammation associated with metabolic disorders. Ginger contains bioactive compounds such as gingerol and shogaol, which have been reported to contribute to antioxidant, anti-inflammatory, and metabolic regulatory activities (Mao et al., 2019).

The significant reduction observed between pre-test and post-test blood glucose levels demonstrates the potential synergistic effect of cinnamon and ginger in diabetes management. The combination of these herbal ingredients may work through multiple metabolic pathways, including improving insulin sensitivity, reducing oxidative stress, and enhancing glucose metabolism. Similar findings were reported, who found that warm cinnamon infusion was associated with reduced blood glucose levels among patients with diabetes mellitus. Comparable findings were also reported by (Astuti et al., 2022) who found that ginger decoction was associated with reduced blood glucose levels among patients with diabetes mellitus. These findings support the concept that herbal therapies may serve as complementary approaches in diabetes management.

In addition to the pharmacological properties of cinnamon and ginger, behavioral changes during the intervention period may also have contributed to the observed improvement. Respondents received education regarding healthy dietary habits, blood glucose monitoring, and the importance of maintaining regular physical activity. Such educational interventions may increase awareness and encourage healthier lifestyles, which are essential components of diabetes management. Therefore, the reduction in blood glucose levels observed in this study was likely influenced not only by the herbal intervention itself but also by improvements in respondents' health behaviors throughout the intervention period.

Bivariate Analysis

The bivariate analysis using the paired t-test demonstrated a statistically significant effect of cinnamon and ginger decoction on reducing fasting blood glucose levels among respondents. The statistical findings revealed a significant decrease in mean blood glucose levels after the intervention, indicating that the combination of cinnamon and ginger was effective in lowering blood glucose levels among patients with diabetes mellitus. Prior to conducting the paired t-test, the normality test confirmed that the data were normally distributed, validating the use of parametric statistical analysis.

The significant reduction in blood glucose levels observed in this study supports the growing evidence regarding the effectiveness of herbal-based interventions in diabetes management. Cinnamon contains bioactive compounds such as cinnamaldehyde, which can increase insulin receptor sensitivity and improve glucose transport into cells. These mechanisms contribute to improved glycemic control and reduced insulin resistance. Meanwhile, ginger contains gingerol and shogaol, which possess anti-inflammatory and antioxidant properties that may reduce oxidative stress associated with diabetes mellitus. The synergistic combination of these compounds may explain the substantial decrease in blood glucose levels observed after the intervention.

The findings of this study are consistent with previous studies conducted, which reported that cinnamon infusion significantly reduced blood glucose levels among diabetes mellitus patients after seven days of intervention. Similarly, found that ginger decoction effectively decreased blood glucose levels due to the metabolic effects of phenolic compounds contained in ginger. Additional support was provided by the study conducted by (Permana et al., 2024), which demonstrated a significant reduction in blood glucose levels following ginger administration. These consistent findings strengthen the evidence that cinnamon and ginger possess therapeutic potential in diabetes management.

The effectiveness of the intervention may also be associated with improvements in respondents' awareness and lifestyle behaviors during the study period. Educational support regarding healthy eating habits and physical activity likely contributed to better glycemic control among respondents. Effective diabetes management requires not only pharmacological or herbal treatment but also sustainable lifestyle modification. Therefore, integrating herbal interventions with health education may provide more optimal outcomes for patients with diabetes mellitus.

Overall, the results of this study indicate that the combination of cinnamon and ginger decoction may serve as a beneficial non-pharmacological therapy for reducing blood glucose levels among patients with diabetes mellitus. The intervention demonstrated both clinical and statistical significance, suggesting its potential as an affordable and accessible complementary therapy within community-based diabetes management programs.

CONCLUSION

This study found that fasting blood glucose levels among patients with diabetes mellitus in RT 02 RW 04 Kampung Sukamanah, Parung Panjang, Bogor decreased after the administration of a combination of cinnamon and ginger decoction. The main finding showed a significant difference between pre-test and post-test blood glucose levels, indicating that the intervention was associated with improved glycemic control among the respondents. Most respondents were middle-aged adults and predominantly female, suggesting that age, gender, metabolic changes, and lifestyle factors may be important considerations in community-based diabetes management.

The scientific contribution of this study lies in providing empirical evidence on the use of a combined cinnamon and ginger decoction as a complementary non-pharmacological approach to support diabetes mellitus management at the community level. The study highlights the potential role of locally available herbal ingredients containing bioactive compounds, such as cinnamaldehyde in cinnamon and gingerol and shogaol in ginger, which may contribute to glucose metabolism and insulin sensitivity. These findings may support nursing practice and community health education by offering an affordable and accessible complementary strategy to assist patients in managing blood glucose levels, while still emphasizing that herbal interventions should not replace standard medical treatment.

However, this study has several limitations. The research used a pretest–posttest design without a control group, so the decrease in blood glucose levels cannot be attributed solely to the cinnamon and ginger decoction. Other factors, such as dietary intake, physical activity, medication history, adherence to fasting before measurement, and lifestyle changes during the intervention period, may have influenced the results. In addition, the sample size was relatively small and the intervention period was short. Therefore, future studies are recommended to use a larger sample, a control group, a longer intervention duration, and additional clinical indicators such as HbA1c to provide stronger evidence

regarding the effectiveness and safety of cinnamon and ginger decoction in diabetes management.

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