




## The Application of Cinnamon Extract to Reduce Blood Sugar Levels in Diabetes Mellitus Patients in Parambunan Village in 2023

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ARTICLE INFO	ABSTRACT
<p><b>Article history:</b></p> <p>Received Aug 30, 2023 Revised Sep 14, 2023 Accepted Sep 30, 2023</p>	<p>Diabetes Mellitus (DM) is a metabolic disorder characterized by hyperglycemia associated with abnormalities in carbohydrate, fat, and protein metabolism caused by decreased insulin secretion or decreased insulin sensitivity, or both and causing chronic cardiovascular and neuropathy complications. A person is said to suffer from diabetes mellitus clinically if there are symptoms of diabetes mellitus, namely eating a lot, drinking a lot, frequent urination and weight loss and the results of fasting blood glucose levels are <math>&gt;126</math> mg/dL or 2 hours after drinking 75 g of glucose solution the blood glucose level is <math>&gt;200</math> mg/dL. In addition to pharmacological treatment, diabetes mellitus can be treated with natural ingredients, one of which is cinnamon extract. Cinnamon contains flavonoids that can help lower blood sugar levels. Objective: To determine the effect of administering cinnamon extract on reducing blood sugar levels in diabetes mellitus patients in Parambunan Village. Method: This research method is a case study using a one-group pretest-posttest design in diabetes mellitus patients. The instruments used were a cinnamon extract implementation sheet and a blood sugar level result sheet before and after cinnamon extract administration. Results: After the cinnamon extract intervention, it was found that there was a change in blood sugar levels after cinnamon extract administration. Conclusion: This case study research proved that there was an effect of cinnamon extract administration on reducing blood sugar levels in diabetes mellitus patients in Parambunan Village.</p>
<p><b>Keywords:</b></p> <p>Diabetes Mellitus, Blood Sugar Levels, Cinnamon Extract.</p>	<p><i>This is an open access article under the <a href="https://creativecommons.org/licenses/by-nc/4.0/">CC BY-NC</a> license.</i></p> 

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### 1. Introduction

Diabetes Mellitus is a disease which is the mother or host of all diseases that exist in the human body in general (Simatupang & Kristina, 2023), (Dalimunthe & Silalahi, 2021) Diabetes Mellitus can lead to various other illnesses. Complications of this disease can range from head to toe, from heart disease and stroke to devastating kidney failure to infections, especially in the feet, which can lead to amputation, all of which can ultimately be fatal. (Tandra, 2020), (Alfaqih, Kep, & Ns Bayu Akbar Khayudin, 2022) Diabetes mellitus is a serious chronic disease, where the pancreas is unable to produce insulin in the body, but it can also occur if the body is not effective in using the insulin it produces (Aini, 2022), (Julieta, Hartono, & Sunarto, 2023).

Viewed from the gender category, IDF calculated that the prevalence of diabetes in women in 2019 was 9% while it was 9.65% in men.(Lilmawati, 2022),(HENDRAYANI, 2022)In general, diabetes mellitus is estimated to increase with increasing population age, from 19.9% to 111.2 million people aged 65-79 years. It is predicted that this number will continue to increase to 578 million people in 2030 and then 700 million in 2045 (Fatria & Maidar, 2022),(Muflihatin et al., 2021).

Diabetes Mellitus (DM) is a metabolic disorder characterized by hyperglycemia related to abnormalities in carbohydrate, fat, and protein metabolism caused by decreased insulin secretion or decreased insulin sensitivity, or both and causing chronic cardiovascular and neuropathic complications(Arwanda, Rafidah, & Khasanah, 2019),(Dewi et al., 2021)A person is said to be suffering from diabetes mellitus clinically if there are symptoms of diabetes mellitus, namely eating a lot, drinking a lot, urinating frequently and losing weight and the results of a fasting blood glucose test are  $>126$  mg/dL or 2 hours after drinking 75 g of glucose solution the blood glucose level is  $>200$  mg/dL (Fatimah, 2015),(Firdaus, Indrawati, Wahdi, Puspitosari, & Arham, 2022). The normal human blood sugar threshold is 60-120 mg/dL when fasting and if the blood sugar level exceeds 140 mg/dL a person has a high risk of contracting diabetes (Arifin, 2022),(Lusiana, Widayanti, Mustika, & Andiarna, 2019).

Based on the 2022 Sibolga City Health Profile Data, the number of diabetes mellitus cases recorded throughout the city was 1,892. With a total population of 89,584, the prevalence of diagnosed diabetes mellitus in the city is 2.11%.

If the data is brought down to the sub-district level with the assumption of an even distribution of population and cases, and referring to the monographic data of Parambunan Sub-district which has a population of 4,856 people, then the estimated number of Diabetes Mellitus sufferers in Parambunan Sub-district is 102 people (HARDIANTO, 2022). Thus, the prevalence of Diabetes Mellitus in Parambunan Village can be estimated at 2.1% (PULUNGAN, 2022).

This figure is above the national prevalence (1.5% according to Riskesdas 2018) and even higher than the prevalence in DKI Jakarta (2.6%).(Suha & Rosyada, 2022),(Ardian & Utami, 2020)This high number indicates that diabetes mellitus has become a significant public health problem in Parambunan Village. The increasing prevalence of diabetes mellitus has shifted this disease's position to the top 10 leading causes of death and morbidity (trends in disease leading causes of disease), and has contributed to the increasing mortality rate (Yunara et al., nd),(Asriwati & Ns, 2021). Based on these conditions, treatment efforts through complementary therapy such as the use of cinnamon extract are very relevant to further study their application in Parambunan Village (Salsabila, 2023).

The high prevalence of type 2 Diabetes Mellitus is caused by risk factors that cannot be changed, for example gender, age and genetic factors. The second is risk factors that can be changed, for example smoking habits, pancreatic levels or impaired insulin function (Mahdia et al., 2018).

Diabetes mellitus (DM) can be controlled with appropriate management to prevent complications. DM management includes pharmacological and non-pharmacological interventions. Long-term pharmacological treatment, including the use of anti-glycemic drugs, often causes side effects, necessitating more effective and safer alternatives, such as herbal remedies derived from plants, such as cinnamon powder.(Djafar, 2022).

## 2. Methods

The research used is a case study research using a one group pretest posttest design. Case study research is a research by examining a problem through a case consisting of a single unit or a group of people affected by a problem. (Notoadmodjo 2018). This case study was conducted for 7 days on clients with hypertension, with the following inclusion criteria, clients suffering from diabetes mellitus,  $> 150$  mg / dL, clients suffering from diabetes mellitus willing to be given traditional medicine therapy from cinnamon extract, and exclusion criteria Clients who do not have a history of diabetes mellitus, clients who are not willing to be given traditional medicine therapy from cinnamon extract, Patients with emergency conditions after the procedure. Administration of cinnamon extract is given in the morning and evening before bed. The instruments used are the cinnamon extract implementation sheet, and the blood sugar results sheet before and after administration of cinnamon extract.

### 3. Results and Discussion

The results of the study obtained from 4 respondents in Gemah Village who suffered from diabetes mellitus showed that the results after the cinnamon extract therapy treatment on the respondents were obtained, namely Mrs. R 145 mg / dL, Mrs. K 139, Mrs. A 131 mg / dl, and Mr. P 125 mg / dL. From these results, it shows that the application of cinnamon extract intervention to clients with diabetes mellitus obtained results, namely the difference in blood sugar levels in clients before being given cinnamon extract therapy and after being given cinnamon extract had decreased. This is in accordance with research conducted by (Syafriani, 2017) which states that before the cinnamon extract application intervention was carried out, the blood sugar levels were checked first, then the cinnamon extract application intervention was carried out 14 times a week in the morning and evening.

This case study is in line with the research results of Hj. Isnaniah (2017), entitled *The Effect of Cinnamon Brewing on Reducing Sugar Levels in Diabetes Mellitus Patients in the Martapura Community Health Center Area, Banjar Regency*, showing that the results of blood sugar examinations in Diabetes Mellitus patients after being given cinnamon brewing varied between 102 and 496 mg/dl. Based on statistical tests with test tests, a p value of  $0.032 < \alpha 0.05$  was obtained, namely there was a difference in the average results of blood sugar level examinations before and after being given cinnamon powder brewing.

This case study aligns with Azmaina's (2021) research, "The Effect of Cinnamon Brewing on Blood Sugar Levels in Type II Diabetes Patients." The study found that the average blood sugar level after cinnamon infusion was 148.95 mg/dL. A statistical test showed a p-value of 0.000. It can be concluded that cinnamon infusion has an effect on reducing blood sugar levels in type II diabetes mellitus patients. It is hoped that the results of this study will encourage all parties to utilize cinnamon to help lower blood sugar levels in type II diabetes mellitus patients.

Based on the research results from Nur Ichan.H (2021) shows the results of a study entitled *The Effectiveness of warm cinnamon infusion on reducing blood sugar levels in Diabetes Mellitus sufferers* that of the 25 respondents with diabetes mellitus before being given warm cinnamon infusion, the majority of 21 people (84%) had a BCG  $\geq 300$  ml / dl and as many as 4 people (16%) had a BCG  $\geq 200$  ml / dl and respondents with diabetes mellitus after being given warm cinnamon infusion, the majority of 19 people (76%) had a BCG  $\geq 200$  ml / dl, as many as 2 people (8%) had a BCG  $\geq 150$  ml / dl, and as many as 4 people (16%) had a BCG  $\geq 100$  ml / dl, and from the results of the Paired T test with a p value of 0.02 which means  $p < 0.05$ . This indicates the effectiveness of giving warm cinnamon tea to reduce blood glucose levels in diabetes mellitus sufferers.

Based on several studies on the use of cinnamon, it has a bioactive component, cinnamaldehyde, which is an antioxidant that can fight free radicals. Giving cinnamon at a dose of 1-6 g/day to people with type 2 diabetes for 40 days can lower blood glucose. Giving cinnamon (*Cinnamomum burmanii*) brew at a dose of 4 g/day for 7 days can lower blood sugar levels in mice induced by alloxan. Cinnamon oil has also been shown to be effective in treating respiratory tract infections caused by fungi and can inhibit the growth of certain bacteria, including *Listeria* and *Salmonella*. The antimicrobial effect of cinnamon can also help prevent tooth decay and reduce bad breath (Hans, 2020).

### 4. Conclusions

Blood sugar levels in respondents with diabetes mellitus in Gemah sub-district before being given cinnamon extract with blood sugar were 170 to 300 mg/dL and after being given cinnamon extract for 7 days the results were 120 to 160 mg/dL. Results Research shows that blood sugar levels decreased before and after the cinnamon extract intervention. Therefore, the cinnamon extract has an effect.cinnamon to reduce blood sugar levels in diabetes mellitus patients in Parambunan Village, Sibolga City. The flavonoids contained in cinnamon work by increasing glucose metabolism and converting glucose into energy. This process increases cell sensitivity to insulin, thereby lowering blood glucose levels. Cinnamon is an alternative treatment for diabetes because it contains chemical

compounds such as safrole, eugenol essential oil, tenin, cinnamaldehyde, resin, potassium oxalate, tannins, and flavonoids (Hastuti, 2014).

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