COMPREHENSIVE HEALTH CARE
e-ISSN : 2722-1563
p-ISSN : 2580-7137

Effectiveness Of Giving Cinnamon Brewing (Cinnammon Burmanni) On Blood Glucose Levels In Elderly People With Type 2 Diabetes Mellitus At Hospital X

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Article Info
Article History:
Received:

Revised:

Accepted:

*Corresponding Author :

DOI

P- ISSN : 2722-1563
E -ISSN : 2580-7137

ABSTRACT

Background: Health problems of diabetes mellitus can affect organs of the body and as a result can cause various kinds of complaints of disease. People often pay less attention to lifestyle, such as daily food consumed. Objective: The purpose of this nursing care is expected to be able to understand, explain and apply evidence-based practices in professional nursing, after the Administration of Cinnamon Burmanni Tea on Blood Glucose Levels in the Elderly with Type 2 Diabetes Mellitus at Hospital X. Research Method: The evidence-based nurse (EBN) design used is Quasy Experiment, especially pretest-posttest design. Namely by conducting observations before and after the control group intervention. There are two intervention groups, namely 2 groups that are given Cinnamon Burmanni Tea on Blood Glucose Levels in the Elderly for 4 consecutive days and carried out 2 times a day. Results: The results of the control group showed an average blood glucose level with a mean value of 2.00 mg / dl (SD = 0.000). Meanwhile, in the intervention group, blood glucose levels in elderly DM patients after giving cinnamon infusion (Cinnammon Burmanni) with a mean value or average blood sugar level of 1.25 (SD = 0.500) with a p-value (0.024) or less than the significance value of p-value <0.05. Conclusion: There is an effect of giving cinnamon infusion (Cinnammon Burmanni) on reducing blood glucose levels in elderly patients after intervention

Keywords: Cinnamon Infusion (Cinnammon Burmanni), GDS, Type 2 Diabetes Mellitus, Elderly

INTRODUCTION

Health problems of diabetes mellitus can affect organs of the body and as a result can cause various kinds of complaints of disease. People often pay less attention to lifestyle, such as the daily food they consume. Diabetes mellitus sufferers in Indonesia do not only attack the elderly, adults and adolescents can also get diabetes mellitus. Diabetes mellitus is a non-communicable disease that is one of the public health problems, which has an impact globally, regionally, nationally and also locally (Iyar et al, 2019). Diabetes Mellitus (DM) is a category of non-communicable diseases (PTM) which is a public health problem, both globally,

regionally, nationally and locally. Diabetes is a serious long-term disease that occurs either when the pancreas does not produce enough insulin (a hormone that regulates blood sugar, or glucose), or when the body cannot effectively use the insulin produced (Fitiriani et al., 2021). Based on IDF data in 2019, diabetes mellitus sufferers are estimated to increase by 700 million people in 2045, Indonesia is ranked sixth after China, India, the United States, Brazil, and Mexico as the country with the highest prevalence of diabetes mellitus sufferers. Diabetes sufferers in Indonesia are increasing, in 2007 it was 5.7% and in 2013 it was 6.9% (IDF, 2020). According to the International Diabetes Federation (IDF) (2020), the prevalence of diabetes mellitus in 2019 was 463 million people and in 2045 it is estimated to reach 700 million people worldwide. In 2017, Indonesia was ranked sixth in the world for the highest prevalence of diabetes sufferers after China, India, the United States, Brazil and Mexico with an estimated number of people with diabetes of 10.3 million and the percentage of deaths due to diabetes in Indonesia was the second highest after Sri Lanka (Fitiriani et al., 2021). Diabetes Mellitus is a disease that is the mother or host of all diseases in the human body in general. Diabetes Mellitus can cause various other types of diseases. Complications of this disease can arise from head to toe, ranging from heart disease and stroke, miserable kidney failure, to infections especially in the feet that can lead to amputation and all can eventually take lives (GunawanA.W, 2020).

People with type II diabetes mellitus usually consume chemical drugs to lower blood glucose levels. Negative effects can have an effect on the body caused by chemical drugs. In addition to the price of drugs that tend to be expensive, current diabetes drugs still do not fully provide solutions for people with diabetes mellitus, which is what makes people start to switch to other alternatives, such as through cinnamon decoction therapy (Syafriani & Verawati, 2017). Herbal medicine is currently very rapid in society. Dried cinnamon bark comes from the genus Cinnamomum. This cinnamon plant can grow in mountainous areas and is one of the plants that are widely preserved in Indonesia, and one type of plant is Cinnamomum cassia (Landani & Kurniawaty, 2018) This study is in line with the study of Wanti, et al (2019) entitled the effect of cinnamon decoction (cinnamomum burmanii) on fasting blood sugar levels in patients with type 2 diabetes mellitus. The results of the study showed a difference in fasting blood sugar levels in patients with type 2 diabetes mellitus at the Harapan Raya Pekanbaru Health Center after being given an intervention in the form of cinnamon decoction in a dose of 10 mg given 2 times a day immediately after breakfast and dinner for 3 consecutive days with significant results with a p value of 0.006 $<\alpha$ (0.05). The results of this study are also supported by the study of Syafriani & Verawati (2017) entitled the effect of cinnamon extract on reducing blood sugar levels in patients with type II diabetes in Kumantan village, Bangkinang City Health Center working area. The results of the study showed that there was

a decrease in blood sugar levels of respondents after the cinnamon extract intervention, which was 37.75 mg/dl, where blood glucose levels before the intervention were 263.40 mg/dl and after the intervention were 225.65 mg/dl.

The results of a preliminary study conducted by the author at Hospital X found that the incidence rate of type 2 Diabetes mellitus patients was 89%. It appears that the hospital still does not consider this complementary therapy program to be one of the interventions that can be applied in hospitals for Type II Diabetes mellitus patients. This intervention is one part of a program to reduce GDS in elderly patients which can be a reference for nurses. Based on the background description above, the author is interested in conducting EBN regarding. "Evidence-Based Nursing Practice Analysis of the Effectiveness of Giving Cinnamon Burmanni Brewing on Blood Glucose Levels in the Elderly with Type 2 Diabetes Mellitus at Hospital X".

The aim of this nursing care is expected to be able to understand, explain and apply evidence-based practices in professional nursing, Giving Cinnamon Brew (Cinnammon Burmanni) to Blood Glucose Levels in Elderly with Type 2 Diabetes Mellitus at Hospital X

MATERIALS AND METHODS

The evidence based nurse (EBN) design used is a Quasy Experiment, especially the pretest-posttest design. Namely by conducting observations before and after the intervention without a control group. There are two intervention groups, namely the group given Foot Soak Therapy Using Warm Water for 4 consecutive days and carried out 2 times a day

RESULTS

The research was conducted at Hospital X and the results of the research are as follows:

Table 1: Frequency Distribution of Respondents Based on Age, Gender, and Occupation and Glucose (n=4)

Variabel	*n*	*%*
Age		
55-60 Years	2	50
>61 Years	2	50
Gender		
Male	2	50
Female	2	50
Blood Sugar Level Before Intervention		
Normal <120 mg/dl	-	
Abnormal >120 mg/dl	4	100
Blood Sugar Level After Intervention		

Normal <120 mg/dl	3	75
Abnormal >120 mg/dl	1	25

Based on table 1 shows the distribution of respondents in this study, the majority of elderly people with Type 2 DM aged >55 years with male and female gender of 50%. The blood glucose levels of elderly people with Type 2 DM before the intervention (pretest) mostly had glucose levels above 120 mg/dl as much as 100% and blood glucose levels after the intervention (posttest) with a normal category of 75%.

Table 2: Distribution of glucose frequency distribution before intervention (n=4)

Variabel	Distribution		Mean	SD
	n	*%*		
Blood glucose before intervention				
Normal <120 mg/dl	-		222.50	42.289
Abnormal >120 mg/dl	4	100		

Based on table 2 shows the distribution of blood glucose levels before the administration of cinnamon infusion (Cinnammon Burmanni) the majority of elderly people have abnormal blood glucose levels >120 mg/dl of 100% with a mean value of 222.50 (SD= 42.289) which means that the average blood glucose in elderly patients with Type 2 DM is mostly above >222 mg/dl. Blood glucose levels above 120 mg/dl in the elderly are said to be abnormal or hyperglycemic.

Table 3: Frequency distribution of glucose after intervention (n=4)

Variabel	Distribution		Mean	SD
	n	*%*		
Blood glucose after intervention				
Normal <120 mg/dl	3	75	107.25	4.573
Abnormal >120 mg/dl	1	25		

Based on table 3 shows the distribution of blood glucose levels after the administration of cinnamon infusion (Cinnammon Burmanni) the majority of elderly people have normal blood glucose levels <120 mg/dl of 75% with a mean value of 107.25 (SD = 4.573) which means the average blood glucose in elderly patients with Type 2 DM is mostly <107 mg/dl. Based on the statistical results, it shows that the blood glucose levels of the elderly after the administration of cinnamon infusion (Cinnammon Burmanni) experienced a decrease in blood glucose, the blood glucose of the elderly before the intervention was 222gr/dl and after the intervention it became <107 mg/dl so that blood glucose <120gr/dl is categorized as normal glucose levels.

Table 4 Distribution of Blood Glucose Levels in the Intervention and Control Groups

Variable	Intervention Group		Control Group		P-Value
	Mean	SD	Mean	SD	
Blood Glucose Levels	1.25	0.500	2.00	0.000	0.024

Table 4 shows the results of the distribution of blood glucose levels in the intervention group and the control group. The results of the control group showed an average blood glucose level with a mean value of 2.00 mg/dl (SD = 0.000). While in the intervention group, blood glucose levels in elderly DM patients after administration of cinnamon infusion (Cinnammon Burmanni) with a mean value or average blood sugar level of 1.25 (SD = 0.500) with a p-value (0.024) or less than the significance value of p-value <0.05 which means that there is an effect of giving cinnamon infusion (Cinnammon Burmanni) on reducing blood glucose levels in elderly patients after intervention.

DISCUSSION

Shows the distribution of respondents in this study, the majority of elderly people with Type 2 DM aged >55 years with male and female gender of 50%. The blood glucose levels of elderly people with Type 2 DM before the intervention (pretest) mostly had glucose levels above 120 mg/dl as much as 100% and blood glucose levels after the intervention (posttest) with a normal category of 75%. In line with research conducted by Novendy et al., (2020) on the effectiveness of giving cinnamon in reducing blood sugar levels after 2 hours of administration with an average random blood sugar value in all respondents before being given cinnamon infusion of 231.0 ± 83.08 mg/dL. Then reinforced by research conducted by Wanti et al., (2019) on the effect of cinnamon decoction (Cinnamomum Burmanii) on blood sugar in type II diabetes mellitus patients with an average blood sugar level before being given intervention of 245.94 mg/dL with a standard deviation of 76.181.

Based on the characteristics of the respondents' age, the results of the literature review show that the age range of 40 to 65 years is an effective age to be given cinnamon extract. This is in line with research conducted by Isnaniah & Nirwana (2017), that cinnamon has an effect on reducing blood glucose levels in respondents aged ±55 years. Other researchers, as stated by previous researchers, have an effect on giving cinnamon extract to reduce blood glucose levels in respondents aged 46-59 years (Fitriani et al, 2019).

The effectiveness of giving cinnamon extract seen from characteristics based on gender shows that all genders, both male and female, have effectiveness. Women have a

higher risk of developing diabetes mellitus because women generally do less physical activity (sports), this can make muscles stiff, the body weak and susceptible to disease so that before giving cinnamon extract all respondents had high blood sugar levels (Fatmalia & Muthoharoh, 2017).

Previous researchers also revealed that before the intervention was given, all respondents had high blood sugar levels. The above study shows that the average blood glucose levels of diabetes mellitus sufferers are above normal which is caused by several factors, one of which is gender (Syafriani & Verawati, 2017). In line with the study conducted by Budi et al., (2020), where there was a significant decrease in blood sugar levels after being given an intervention of cinnamon, other studies such as (Arissandi et al, 2019). also revealed a decrease in blood glucose levels after being given the intervention.

Showing the distribution of respondents in this study, the majority of elderly people with Type 2 DM aged >55 years with male and female gender of 50%. The blood glucose levels of elderly people with Type 2 DM before the intervention (pretest) the majority had glucose levels above 120 mg/dl as much as 100% and blood glucose levels after the intervention (posttest) with a normal category of 75%. showing the distribution of blood glucose levels after being given cinnamon infusion (Cinnammon Burmanni) the majority of elderly people had normal blood glucose levels <120 mg/dl of 75% with a mean value of 107.25 (SD = 4.573) which means that the average blood glucose in elderly patients with Type 2 DM is mostly <107 mg/dl. Based on statistical results, it shows that the blood glucose levels of the elderly after being given cinnamon infusion (Cinnammon Burmanni) experienced a decrease in blood glucose, the blood glucose of the elderly before the intervention was 222gr/dl and after the intervention it became <107 mg/dl so that blood glucose <120gr/dl is categorized as normal glucose levels.

The amount of cinnamon given in the study by Suriadi et.al is different from this study, which is 3 grams in capsules 3 times a day and given for 2 weeks (Novendy et al., 2020). This is in line with previous studies that cinnamon infusion can reduce blood sugar levels by an average of 73,600 mg/dl with the intervention of giving cinnamon infusion 2 times a day for 7 consecutive days. While the dosage of cinnamon extract from all articles has different effects, the dose that has a high effect on reducing blood glucose levels is a dose of ± 8 grams of cinnamon powder and 100 ml of water per day given for 14 days (Azmaina et al, 2021). Various doses given must still be closely monitored for those who consume cinnamon, as stated by that giving too high a dose of cinnamon can

cause hepatotoxic effects (Novendy et al, 2020). Research on herbs conducted by (Awaluddin & Purwanto, 2019). also stated that there is a significant relationship between the level of knowledge and attitudes of the elderly with the use of traditional medicine for a statistical test p value of 0.004 <alpa 0.05. Another complementary therapy for people with diabetes mellitus is research (Awaluddin et al., 2019) that diabetes gymnastics is effective in reducing blood glucose levels in people with type II Diabetes Mellitus with a p value of 0.000 and research and (Awaluddin et al., 2019) there is a difference in the effectiveness of wound care using honey and sofratulle on healing diabetic wounds in patients with diabetes mellitus at the Bhayangkara Hospital Pekanbaru (p value = 0.000 <α)

Shows the results of the distribution of blood glucose levels in the intervention group and the control group. The results of the control group showed an average blood glucose level with a mean value of 2.00 mg / dl (SD = 0.000). While in the intervention group, blood glucose levels in elderly DM patients after giving cinnamon infusion (Cinnammon Burmanni) with a mean value or average blood sugar level of 1.25 (SD = 0.500) with a p-value (0.024) or less than the significance value of p-value <0.05 which means that there is an effect of giving cinnamon infusion (Cinnammon Burmanni) on reducing blood glucose levels in elderly patients after intervention. Based on several studies on the use of cinnamon, it has a bioactive component of cinnamaldehyde which is an antioxidant that can fight free radicals. Giving cinnamon infusion at a dose of 1-10 gr / day to patients with type 2 DM for 2 weeks can reduce blood glucose. Giving cinnamon (Cinnamomum burmanii) infusion at a dose of 10 grams/day for 7-14 days can lower blood sugar levels. 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 (Parham et al., 2020).

The antimicrobial effects of cinnamon can also help prevent tooth decay and reduce bad breath (Hans, 2020). A previous RCT study on male rats found that giving cinnamon significantly increased fat mass and low-density lipoprotein (LDL) cholesterol, reducing fasting blood sugar levels by up to 12%. Liver function was normal in male rats that consumed cinnamon. In another RCT study conducted on adults with type 2 DM, it was found that cinnamon consumption significantly reduced fasting blood glucose levels, triglycerides, total cholesterol, and LDL cholesterol (Mandal et al., 2021; Shang et al., 2021) This study has limitations in that researchers cannot be sure whether all respondents adhered to the study protocol during the observation. The biases of this

study include the physical condition of the respondents who have varying ages, the length of time they have been diagnosed with type 2 DM, and the diet of diabetics because some of them have been on a strict diet to control their blood sugar levels. Other confounders, such as social habits, ethnicity, and food substances that affect the work of cinnamon in the body's metabolism (Emilda, 2018; Zare et al., 2019). The administration of cinnamon powder infusion to overcome the problem of unstable blood glucose levels in type II DM is an intervention in the form of administering 3 grams of cinnamon powder infusion in 100 ml of warm water and drinking it 3 times a day (Dafriani et al., 2018; Novendy et al., 2020; Tanti, 2019). On the other hand, there are studies that did not find a significant effect of cinnamon on blood sugar, such as a study conducted on 58 type 2 diabetes patients who previously consumed oral antihyperglycemic drugs from the sulfonylurea, biguanide, thiazoledinediones, glucosidase inhibitor, and meglitinide groups. In this study, respondents were given cinnamon (C. cassia) or placebo (wheat flour) intervention, and the results showed that there were no significant changes in fasting blood glucose levels and HbA1c. The dose of cinnamon used for the study was 1 gr. 51 It should be understood that the effect of cinnamon on blood glucose control is likely to depend on the form of cinnamon used for the patient. In addition, different extraction methods may affect the efficacy of cinnamon. It has been shown that water-soluble polyphenol polymers from cinnamon can significantly improve insulin-dependent glucose metabolism in vivo and lead to increased antioxidant activity (Yu T, Lu K, Cao X, et al. 2023).

Cinnamon is a native spice from the genus Cinnamomum that has shown several beneficial functional properties in health, including protective activity against type 2 diabetes mellitus. Cinnamon infusion has been shown to significantly reduce postprandial maximum glucose concentration and maximum concentration variation in healthy adults (Rachid AP et al., 2022).

CONCLUSIONS

The results of the distribution of blood glucose levels in the intervention group and the control group. The results of the control group showed an average blood glucose level with a mean value of 2.00 mg/dl (SD= 0.000). While in the intervention group, blood glucose levels in elderly DM patients after giving cinnamon infusion (Cinnammon Burmanni) with a mean value or average blood sugar level of 1.25 (SD=0.500) with a p-value (0.024) or less than the significance value of p-value <0.05 which means that there is an effect of giving cinnamon infusion (Cinnammon Burmanni) on reducing blood

glucose levels in elderly patients after the intervention.

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