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EFFECT OF HERBAL THERAPY WITH STEEPING SALAM LEAF TO DECREASE BLOOD GLUCOSE LEVELS AMONG ELDERLY PATIENTS WITH DIABETES MELLITUS

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ABSTRACT

Introduction: Diabetes Mellitus (DM) is a group of metabolic disease mostly occurs in the elderly characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. The number of elderly patients with DM in Suruh village of Sukodono subdistrict, Sidoarjo regency adapt alternative ways to control blood sugar levels. The purpose of this study was to analyze the influence of herbal therapy with steeping Salam leaves against a defect in insulin secretion in the elderly. **Methods:** This study designs is a pre-experimental designs (One-group pretest-posttest design). Samples were taken using purposive sampling and obtained as many as 28 elderlies from the Rural District of Sukodono, Sidoarjo. The independent variable is herbal therapy with steeping Salam leaves, and the dependent variables are the blood glucose levels in the elderly. Glucose monitoring research instruments are used for the measurement of blood sugar levels. Test data analysis using Paired *T*-test $\rho \leq 0.05$. **Results:** The results showed that the steeping Salam leaves for lowering of blood glucose levels in elderly people with diabetes mellitus is evidenced by the results of Paired *t*-test Test showed $\rho = 0.000$ before and after the treatment groups. **Conclusion:** Based on the results of this study it can be concluded that the steeping Salam leaves containing astringent compounds can affect insulin sensitivity thereby stimulating the parasympathetic autonomic nerve stimulation and stimulate the release of insulin from the pancreas gland. Furthermore, the public are advised to use an alternative way to control blood sugar levels.

Keywords: Salam Leaf Infusion; Blood Glucose Levels; Elderly; Diabetes Mellitus

INTRODUCTION

According to American Diabetes Association (ADA), 2021, Diabetes Mellitus (DM) is a group of metabolic diseases characterized by hyperglycemia that occurs due to abnormalities in insulin secretion, defects in insulin action or both factors. For the prevention of Diabetes Mellitus, drugs are only complemented to the diet. Drugs need to be given if the maximum dietary regulation is not effective in controlling blood sugar levels. Oral anti-diabetes medications may be useful for people who are allergic to insulin or who do not use insulin injections. This use must be understood, to provide balanced individual dosage so that they will not cause hypoglycemia. As most of the oral antidiabetic drugs have unwanted side effects, experts have developed a relatively safe traditional treatment system for Diabetes Mellitus (Rahayu, Lestari & Sayuti, 2016). Traditionally, the use of vegetable materials for treatment has been carried out by people in Indonesia. One of the vegetable ingredients used is salam leaves, mainly for reduction in cholesterol, treatment of hypertension, diarrhea, and diabetes mellitus therapy (Widowati *et al.*, 2018).

The World Health Organization (WHO, 2021) also predicts an increase in the number of people with Diabetes Mellitus in Indonesia from 8.4 million in 2000 to around 21.3 million in 2030. Likewise, the International Diabetes Federation (IDF) in 2020 estimates a steady increase in the number of people with diabetes. In 2009, it was estimated that 7.0 million people had diabetes mellitus which is likely to hike to 12.0 million in 2030. Despite differences in the prevalence rates, the two reports indicated an increase in the number of people with diabetes by 2-3 times by 2030. According to the results of the Basic Health Research, the highest prevalence rate of diabetes mellitus was found in West Kalimantan and North Maluku (11.1%), followed by Riau (10.4%) and NAD (8.5%) in Papua (1.7%), followed by NTT (1.8%). The highest prevalence of impaired glucose tolerance was found in West Papua (21.8%), followed by West Sulawesi (17.6%) and North Sulawesi (17.3%), while the lowest prevalence rates was found in Jambi (4%), followed by NTT (4.9%). The highest death rate due to DM was in the 45–54-year age group in urban areas by 14.7 percent, while in rural areas it was 5.8 percent (Agency of Health Research and Development, 2018).

There are several factors behind Diabetes Mellitus, namely, a diet that has shifted from a healthy diet containing balanced nutrition to a fast-food pattern with a food composition containing lots of fat, sugar, salt, and less fiber (Adi, 2007). Diabetes mellitus is caused due to the disorders in regulating glucose levels in the blood and disruption in the process of transporting glucose from the blood into cells. Even though glucose levels increase, the process of burning fat and protein remains elevated, which in turn increases ketones in the blood (acetone) and metabolic waste resulting in a process of acid toxification. Everything is caused due to the insufficient production of insulin which the body needs. Therefore, Diabetes Mellitus is a condition in which blood sugar levels increase due to insulin deficiency (Susilo & Wulandari, 2011). Diabetes mellitus is a degenerative disease, and a chronic disease associated with decreased organ function due to the aging process. The function of the pancreas decreases with age and the body's insulin ability to manage blood sugar gets weaker (Maharani, 2010). If Diabetes Mellitus is left uncontrolled or the patient is not aware of the disease, various chronic complications will arise which can be dangerous. Heart disease, impaired kidney function, blindness, leg rot which sometimes requires amputation, to impotence (Purwanto, 2013). The elderly does not know how to avoid Diabetes Mellitus and how to control blood sugar levels when they suffer. The therapy used is only medical drugs that are obtained when they come to the Elderly Integrated Healthcare Center.

According to the research by Rahayu, Lestari & Sayuti (2016), plant materials inhibit the increase in blood glucose namely through inhibition of the activity of enzymes that break down sucrose and carbohydrates, inhibition of glucose absorption, inhibiting antiserotonin activity thereby increasing insulin release from the pancreas. The results of previous research conducted showed that steeping salam leaves with a level of 35% reduces blood sugar levels after giving glucose in rabbits equivalent to the usual dose of glibenclamide and there were no side effects on kidneys and liver of this herbal extract therapy. These results indicated that the herbal extract is quite safe for consumption. Herbal therapy of steeping salam leaves is an alternative way to control blood sugar levels in people with diabetes mellitus. The elderly does not know the correct procedure for making salam leaf steeping and herbal therapeutic doses to reduce glucose levels in the blood. This therapy does not cause any side effects in the elderly, because this herbal therapy has been proven safe.

Based on this background, the researcher wanted to study the effect of herbal therapy of steeping salam leaves on reducing blood glucose levels in elderly people with Diabetes Mellitus in Suruh Village, Sukodono District, Sidoarjo Regency.

METHODOLOGY

This study uses a pre-experimental design (One-group pretest-posttest design) to reveal the cause and effect by involving one group of subjects. The subject group was observed prior to intervention, then observed again after the intervention. The population consists of 30 elderlies with DM. In the study, the sample was taken from 28 elderly with DM from Elderly Integrated Healthcare Center in Suruh Village, Sukodono District who met the following criteria:

1. Inclusion criteria

The Inclusion Criteria in this study were:

a) Respondents are willing to be researched.

b) Male and female.

c) Elderly aged 60-74 years.

d) Random blood glucose level above normal (140-220 mg/dL)

e) Elderly who are not taking antidiabetic drugs.

f) Elderly who are not in a dietary arrangement.

2. Exclusion criteria

The Data Exclusion Criteria for this study were:

a) Respondents resigned during the research.

b) At the time of the research, it turned out that the respondent was sick and could not follow the research procedures.

The sampling technique used in this study is non-probability sampling with purposive sampling technique. The research took place at the Elderly Integrated Healthcare Center, Suruh Village, Sukodono District, Sidoarjo City. In this study, the instruments used were the observation sheet and the glucose test. The glucose test measurement tool is a machine for measuring blood sugar electronically or digitally so that one can easily get the measurement results. Blood sugar measurement is carried out in a sitting position by putting the blood sugar chip into the machine. The needle was inserted into the pen-shaped gun and the depth of the needle was adjusted. Alcohol wipes were used to clean the fingers, the middle finger was used to

check blood sugar. The needle was pierced in the finger and then pressed so that blood comes out. Blood is taken on the strip by just a touch and not dripped on the strip. There is an arrow mark there. The blood will immediately soak in until the end of the strip and there is a beep. Wait a moment, the results will appear after a few seconds on the screen. Finally, the needle is removed from the lancing and discarded.

RESULTS

In this study, there were 28 participants from Sukodono Districts, Sidoarjo City, Indonesia. We discovered that people aged 60 to 65 are mostly affected by Diabetes Mellitus based on demographic data. Table 1 shows the identification of respondents.

Table 1: Identification of Respondents

Identity	Indicator	Freq	%	Total
Gender	Male	6	21%	28
	Female	22	79%	(100%)
Age	60-65	22	78,6%	28
	66-71	6	21,4%	(100%)
	>71	0	0%	
Education	No school	2	7%	28
	Primary	22	79%	(100%)
	Yunior	2	7%	
	Senior	2	7%	
Job	Housewife	17	61%	28
	farm workers	6	21%	(100%)
	Farmer	3	11%	
	Etc	2	7%	
Income	reguler income	3	11%	28
	irregular income	25	89%	(100%)
DM age	30-45	2	7%	28
	46-65	25	89%	(100%)
	> 65	1	4%	
Resources	Midwife	19	68%	28
	Docter	5	18%	(100%)
	Etc	4	14%	
Control	Routine	16	57%	28
	not a routine	12	43%	(100%)
Family history	Yes	7	25%	28
	No	21	75%	(100%)
Dietary habit	Good	28	100%	28
	Not good	0	0%	(100%)

Table 2: Blood Glucose Level Pre-Intervention

Blood glucose level	Freq	%	Control of Blood Glucose
90-144 mg/dL	3	10,7%	Good
145-179 mg/dL	8	28,6%	Moderate
≥ 180 mg/dL	17	60,7%	Bad
Total	28	100%	
rate	183,2 mg/dL		

Table 3: Blood Glucose Level Post Intervention

Blood Glucose Level	Freq	%	Control of Blood Glucose
90-144 mg/dL	10	35,7	good
145-179 mg/dL	8	28,6	moderate
≥ 180 mg/dL	10	35,7	bad
Total	28	100%	
Rate	157,8 mg/dL		

The results of the analysis of the Paired T-test in the treatment group found that the provision of salam leaf steeping water was effective in reducing glucose levels in the elderly suffering from diabetes mellitus, as indicated by the results of $\rho = 0.000 \leq \alpha = 0.05$. **This means that if the provision of** salam leaf steeping water has an effective consequence, it is hoped that the elderly with diabetes mellitus can control their blood sugar levels properly through herbal therapy of steeping salam leaf water. The rate obtained from the blood glucose level Post Intervention is 157.8 mg/dL (refer to table 3).

DISCUSSION

Diabetes mellitus is a degenerative disease, a chronic disease associated with decreased organ function due to the aging process. The older the age, the function of the pancreas decreases and the body's insulin ability to manage blood sugar is gets weaker. There are several factors behind Diabetes Mellitus, such as a diet especially healthy diet containing balanced nutrition to a fast-food pattern with a food consisting of lots of fat, sugar, salt, and less fiber.

The inability of the elderly to control blood sugar is evidenced by the result of high blood glucose levels, this is caused due to less physical activity of the elderly. Many elderly people do not have time to go out in the morning because they are too busy like cooking. One of the factors causing the increase in blood sugar levels in the elderly according to Suharmiati & Roosihermiatie (2012), is a change in body composition, decreased physical activity, and

changes in lifestyle. Susilo & Wulandari (2011) concluded that the decrease in daily physical activity is the main factor determining insulin sensitivity. Weakness in the elderly also causes laziness to move, especially just to do sports, which is considered something that is not usually done in the village. The study stated that time spent idling, time spent on light activity to moderate or strenuous activity does not affect insulin sensitivity if it is adjusted by total activity done.

Diet is also a factor in controlling blood sugar, most respondents do not maintain their diet and they will only maintain their diet when they are sick. This means that the awareness of the elderly is still lacking in efforts to maintain a diet to control their blood sugar levels. Lack of awareness can be caused due to a lack of knowledge about the disease, so that researchers provide counseling about Diabetes Mellitus. Widowati (2018) stated that the emergence of Diabetes Mellitus is not only due to heredity, but also more often due to factors like risky lifestyles. This causes a high chance of disease like Diabetes Mellitus.

An intensive effort must be made by medical schools and public health authorities to educate health care providers and patients on the safe and effective use of Complementary and Alternative Medicine (CAM) therapies. A lifestyle that has begun to shift from a traditional diet to a diet that contains lots of fiber from vegetables and carbohydrates must be implemented. The composition of foods that contain too much protein, fat, sugar, salt, and contain little fiber must be avoided (Matheka & Alkizim, 2012).

Various work histories of the elderly are one of the influencing factors, for example, in the village, farm workers usually get wages in the form of food, so that the elderly does not care about the intake of food consumed. Elderly with diabetes mellitus need special attention, especially on blood sugar levels which can increase and decrease without the sufferer knowing (Rochmah, 2006).

Antidiabetic herbal medicine can decrease blood glucose levels of diabetes mellitus patients (Rahayu, Lestari, & Sayuti, 2016). Complementary and alternative medicine with glucose-lowering effect is increasingly being sought by patients and health care professionals, which is essential for safe and an effective control of blood glucose level (Matheka & Alkizim, 2012).

CONCLUSION

1. The blood glucose level of the elderly who suffered from Diabetes Mellitus before being given the intervention was 183.2 mg /dL.

2. The blood glucose level of the elderly suffering from Diabetes Mellitus after being given the intervention was an average of 157.8 mg /dL.

3. The results showed that there was an effect of herbal therapy of steeping salam leaves on reducing blood glucose levels in elderly people with Diabetes Mellitus in Suruh Village, Sukodono District, Sidoarjo Regency.

Conflict of Interest

The authors declare that the research review was conducted in the absence of any commercial or economic associations that could be construed as a potential conflict of interest.

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