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Activity Test Of Infused Water Okra to Wards Reduction Of Blood Sugar Levels In Type II Diabetes Mellitus Patients In Gondang Tulungagung Village

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ABSTRACT

Background: Diabetes mellitus is a group of metabolic diseases with characteristics of hyperglycemia that occur due to abnormalities of insulin secretion, insulin work or both that leads to multi-organ chronic complications. Okrais an herbal plant that can be used as an alternative to decrease and help stabilize blood sugar levels. The purpose of this study was to determine the activity test of giving infused water okra to reduce blood glucose levels in people with diabetes mellitus type II.

Methods: The research design used is pre-experiment (one group pre-post test design). While the population is of all type II diabetes mellitus in gondang Village Tulungagung District. The sample size is 30 respondents taken by purposive sampling approach. Data collection was conducted on July 22 - July 28, 2020. Using glukotest instruments and observation sheets. Processing and data analysis using SPSS 16.0 statistical application, using Paired T-test with $\alpha = 0,05$.

Results: The result of paired t test statistic shows p-value = 0,000 <α = 0,05. So the H0 rejected H1 accepted which means there is influence of infused water okra to decrease blood glucose level in type II diabetes mellitus patient in gondang village, Tulungagung sub-district. From this research, infused water okra proven to decrease blood glucose level in diabtes mellitus type II patient because of fiber and flafonoid content in it.

Conclusions: With these capabilities are expected to the consumption of infused water okra on a regular basis can keep blood sugar levels remain normal levels in people with diabetes mellitus type II.

I. INTRODUCTION

Non-Communicable Diseases (NCD) is a fairly large public health problem in Indonesia at this time. This is marked by a shift in disease patterns epidemiologically from infectious diseases which tend to decline to non-communicable diseases which are increasing globally in the world, and nationally has occupied the top ten diseases that cause death, including diabetes mellitus. Diabetes mellitus is a group of metabolic diseases characterized by hyperglycemia that occurs due to defects in insulin secretion, insulin action or both. This disease arises slowly and is usually not realized by the sufferer [1]. Diabetes mellitus, which the general public calls diabetes is a chronic disease caused by the body's inability to produce the hormone insulin, this is characterized by high blood sugar levels. Insulin is a hormone released by the pancreas, which is responsible for maintaining normal blood sugar levels. Insulin enters sugar into cells so that it can produce energy or be stored as energy reserves [2]. Based on data from the International Diabetes Federation (IDF) in 2015 as many as 415 million people suffer from diabetes mellitus, this number has increased 4 times from 108 million sufferers in the 1980s. By 2040 it is estimated that the number will be 642 million. In Southeast Asia in 2014 there were 96 million people suffering from diabetes with prevalence increasing from 4.1% in the 1980s to 8.6% in 2014. Indonesia ranks seventh in the world for the highest prevalence of diabetes in the world

along with China, India , the United States, Brazil, Russia, and Mexico with an estimated number of people with diabetes of 10 million, the prevalence of people with diabetes in Indonesia shows a tendency to increase from 5.7% in 2007 to 6.9% in 2013 [3]. In East Java until 2013 there were 222,430 DM sufferers [4]. data from the Tulungagung District Health Office until December 2015 there were 10,578 cases of diabetes mellitus while the data until January 2018 there were 36,451 cases of diabetes mellitus, from this data there was an increase of 25,873 cases. From the data above, we can conclude that diabetes mellitus is a serious threat to the health of the Indonesian people. Diabetes is a disease whose complications can affect all organs of the body from the top of the head to the toes. Serious impacts of diabetes mellitus include eye disorders in the form of retinopathy, kidney failure (nephropathy) and nerves (neuropathy), increasing the risk of heart attack, stroke, for men it can cause impotence and infertility (barren). This disease is chronic and sufferers continue to increase worldwide with increasing population, age, prevalence of obesity and decreased physical activity.In the 2015 DM Management and Prevention Consensus, the management and management of DM is focused on 4 pillars, namely education, medical nutrition therapy, physical exercise and pharmacological intervention. The first step taken in the management of diabetes mellitus, is treatment without drugs in the form of diet and exercise settings. If in this first s the treatment goals have not been achieved, it can be combined with pharmacological steps in the form of insulin therapy or oral hypoglycemic drug therapy, or a combination of both. In addition to pharmacological measures such as insulin therapy or oral hypoglycemic drug therapy, traditional therapy can also be used. The selection of traditional therapy was chosen because in terms of lower costs, safer from side effects because it comes from herbs, widely available in the community, easy to obtain, and Indonesia, which has a tropical climate, is suitable for the growth of various kinds of plants that can be used for treatment. which can be used for the treatment of diabetes include brotowali, bitter leaf, bay leaf, ginseng, crown of the gods, bitter melon, neem leaves, aloe vera, noni, black cumin, garlic and many more. One type of plant that can lower blood sugar levels (hypoglycemic is Okra [5]. Okra contains high fiber which helps stabilize blood sugar by regulating the rate at which sugar is absorbed from the intestinal tract, this fiber also helps control blood sugar levels by slowing the assimilation of sugar through the intestine [6]. As well as protective flavonoids against cell damage as insulin producers so that they can increase insulin sensitivity, flavonoids, especially quercetin in inhibiting GLUT 2 of the intestinal mucosa so that it can reduce the absorption of sugar and fructose from the intestine [7].

From the description above, regarding okra which is believed to be a traditional medicine and has been tested by several researchers proven to be able to lower blood sugar levels, the researchers are interested in examining whether giving okra fruit can reduce blood sugar levels by processing it into infused water which can later be used. by the public as an antidiabetic drug.

II. METHOD

This research was carried out for 7 days, namely on 22 July – 28 July 2020 where the number of respondents was 30 people from Type II Diabetes Mellitus sufferers in Gondang Village, Tulungagung Regency.

The research design used was the Pre Experimental Design research design with One group pre-post test design.

The population in this study were all patients with Type II Diabetes Mellitus in Gondang Village, Tulungagung Regency in 2020. Using a purposive sampling technique.

The data were analyzed using the Wilcoxon signed rank test which will show whether there is an effect of reminiscence therapy on reducing stress levels in the elderly. Because the data can be categorized d on an ordinal scale, the data is then analyzed using the Paired T Test using a nputer with SPSS (Statistical Product and Service Solution Version 16 Windows) technique. To determine t level of significance between variables in the mea ement of a significant influence with the level of significance is p 0.05, meaning that H¬0 is accepted, it means that there is no influence between variables.

III. RESULTS AND DISCUSSION

Table 1. Frequency distribution of respondents' blood glucose levels before giving okra infused water in Gondang Village, Responsibility Tulungagung District.

Low blood suger level *(mg/dl)*	Highest blood sugar level *(mg/dl)*	*Mean (mg/dl)*	Standart Deviasi
107	216	157,73	30,618

Shows that, out of 30 respondents in Gondang Village, Tulungagung City before being given treatment, they had the highest blood glucose level of 216 mg/dl, the lowest blood sugar level of 107 mg/dl, and the average (mean) blood sugar level before being given the treatment. is 157.73 mg/dl.

Table 2 Frequency distribution of respondents' blood glucose levels after giving okra infused water in Gondang Village, Tulungagung Regency

Low blood sugar level *(mg/dl)*	Highest blood sugar level *(mg/dl)*	*Mean (mg/dl)*	Standart Deviasi
93	195	140,30	30,195

shows that, out of 30 respondents in Gondang Village, Tulungagung Regency in 2020 after being given treatment, they had the highest blood glucose level of 195 mg/dl, the lowest blood sugar level of 93 mg/dl, and the average (mean) blood sugar level after being given the treatment. is 140.30 mg/dl.

The analysis Activity Test Of Infused Water Okra To Wards Reduction Of Blood Sugar Level In Type Ii Diabetes Mellitus Patients In Gondang Tulungagung Village in 2020 using a paired t test statistic, the results showed that blood glucose levels before and after administration of infused water okra experienced a significant decrease in average value of 17.43 mg/dl from the data mean blood sugar levels pre 157.73 mg/dl to blood sugar levels post 140.30 mg/dl, and obtained P value (p-value) = 0.000. This means that the hypothesis H0 is rejected and H1 is accepted because the p value < = 0.05. This means that there is an effect of giving okra (Abelmoschus esculentus) infused water on reducing blood glucose levels in patients with diabetes mellitus in Gondang Village, Tulungagung District in 2020.

From the results of the study interpreted in table 4.1, it shows that, of the 30 respondents with type II diabetes mellitus before being given treatment, the highest blood glucose level was 216 mg/dl, the lowest blood sugar level was 107 mg/dl, and the average (mean) blood sugar levels before the treatment was 157.73 mg/dl.

Diabetes Mellitus is a chronic, progressive disease characterized by the body's inability to metabolize carbohydrates, fats and proteins, leading to hyperglycemia (high blood sugar levels) [12]. A person is said to have diabetes if he has fasting blood sugar levels in venous plasma > 126 mg/dL and > 100 mg/dL in capillary blood, on blood sugar tests when venous plasma > 200 mg/dL and in capillary blood > 200 mg/dL. Blood sugar levels throughout the day vary which will increase after eating and return to normal within 2 hours [9]. Diabetes mellitus is a metabolic disease characterized by hyperglycemia [11]. It occurs because the pancreas is unable to secrete insulin, impaired insulin action, or both. Long-term damage and failure of various organs such as the eyes, kidneys, nerves, heart, and blood vessels can occur when in a state of chronic hyperglycemia . Classification of blood glucose levels in patients with diabetes mellitus on fasting blood sugar examination is 80-109 mg/dl is said to be good, 110-125 mg/dl is moderate and >125 mg/dl is said to be bad [10].

From the description [27] the facts and theories above, the researcher argues that there is a match between the theory of blood glucose levels and the results of the study where the results of fasting blood sugar measurements show an average value of 157.73 mg/dl. This value indicates that the respondent has a bad blood glucose level and this requires treatment so that in the future it does not cause complications. Diabetes mellitus can occur because the pancreas gland is unable to secrete insulin, impaired insulin action, or both, this results in impaired sugar metabolism in the body which results in increased blood sugar content, so long-term treatment is needed. Management to keep sugar levels within normal limits is through education, nutritional therapy, physical activity and pharmacology. In addition to chemical drug pharmacology, you can also use non-pharmacological drugs in the form of herbal infused water okra, so that diabetic patients are not dependent on drugs. There are several things that cause type II diabetes to occur including age and gender [11]. Based on cross tabulation data between gender and blood sugar levels (table 4.3) it is known that from 30 respondents before being given infused water okra who were male, almost all of the respondents had bad blood sugar levels, namely 15 people (88.2%)

The Stewardship theory in 2011, the male gender has a higher risk of diabetes than women. Scientists from the University of Glasgow, Scotland revealed this after observing 51,520 men and 43,137 women. All of them are people with type II diabetes and generally have a body mass index (BMI) above the overweight or obese limit. Men with diabetes have an average BMI of 31.83 kg/m2, while women only have it at a BMI of 33.69 kg/m2. This difference in risk is influenced by the distribution of body fat. In men, the accumulation of fat is concentrated around the abdomen, thus triggering central obesity which is more at risk of metabolic disorders. From the description of the facts and theories above, the researcher argues that the male sex is more at risk of developing diabetes mellitus due to differences in risk caused by the distribution of fat in the body and also in men the accumulation of fat is concentrated around the abdomen, which can trigger more central obesity. risk of triggering metabolic disorders. As we know that many men have distended stomachs, usually this is due to a lifestyle such as the wrong diet and no physical activity such as exercise, besides smoking also increases the risk of diabetes in men.

Cross tabulation data from table 4.3 shows that of the 30 respondents before giving okra infused water aged 46-55 years, almost all of the respondents had bad [30] gar levels, namely 6 people (85.7%), while those aged 36-45 years all of the respondents had low blood sugar levels. good blood sugar levels that is 1 person (100%)

According to Petersen, 2016, generally [19] humans experience physiological changes that drastically decline rapidly after the age of 40 years. Diabetes often appears after a person enters a vulnerable age, especially after the age of 45 in those who are overweight, so that their body is no longer sensitive to insulin.

Another theory says that someone 45 years old has an increased risk of diabetes mellitus and glucose intolerance caused by degenerative factors, namely decreased body functions, especially the ability of cells to produce insulin to metabolize glucose. [13].

From the description of the facts and theories that have been described, the researcher agrees with the theory above, that increasing age can be at risk, this is in accordance with various diseases, especially Type II Diabetes Mellitus. Where most of the respondents aged 46-55 years

before being given infused water had poor glucose levels with 6 people (85.7%) this can happen because of the aging process which affects all body functions, one of which is insulin production by the pancreas and work. from insulin itself which is not optimal, so it is important for the community in general and diabetics in particular to maintain health as they age to avoid diabetes.

Based on table 4.4 shows that, of the 30 respondents with type II diabetes mellitus after being given treatment, the highest blood glucose level was 195 mg/dl, the lowest blood sugar level was 93 mg/dl, and the average (mean) blood sugar level after being given. treatment was 140.30 mg/dl.

Okra (Abelmoschus esculentus) in English lady's fingers, okra, or gumbo is a type of flowering plant in the Malvaceae tribe originating from the area around present-day Ethiopia. Okra is a vegetable source that is rich in fiber, minerals, and vitamins, so it is often recommended by nutritionists for cholesterol control and weight loss programs, helps stabilize blood sugar by regulating the rate at which sugar is absorbed from the intestines, and relieves constipation [14].

The chemical constituents of okra include 67.50% -cellulose, 15.40% hemicellulose, 7.10% lignin, 3.40% pectic components, 3.90% fat and wax components and 2.70% aqueous extract [15] -cellulose and hemicellulose are included in anti-diabetic components. Both components are included in the fiber or dietary fiber group. Chemically fiber is a carbohydrate in the form of polysaccharides such as cellulose, hemicellulose and pectin as well as non-carbohydrate fibers such as lignin, gum and mucilage. Fiber can reduce total cholesterol and LDL (Low Density Liquid) and reduce the hyperglycemic response (suppress the rise in blood sugar after eating) [16].

Consuming fiber in okra can lower postprandial blood glucose levels (2 hours after eating) by reducing glucose diffusion and delaying the absorption and digestion of carbohydrates. Okra slime which is a long-chain polysaccharide hydrocolloid with high molecular weight and protein constituents containing both hydrophilic and hydrophobic substances, causes okra fruit slime to have potential as an emulsifying agent, thickener and binding agent [17].

From the results and theoretical facts above, it shows that giving okra infused water can reduce fasting blood glucose levels as evidenced by a decrease in the average value of respondents' blood glucose levels from 157.73 mg/dl to 140.30 mg/dl where there is celysis of 17.43 mg/dl. Although the average value has not yet reached blood glucose levels with a good group (80-10 (mg/dl) but this value has improved from the previous value and it is not impossible if given regularly, the blood sugar level will reach the blood glucose level. normal blood sugar. Researchers also argue that okra infused water can maintain normal blood sugar levels because the fiber and flavonoid content of okra regulates the rate at which sugar is absorbed from the intestine and improves the performance of the pancreas in secreting insulin so that blood sugar levels do not increase as described in theory. on.

Based on table 4.5 cross tabulation between sex and blood sugar levels after giving okra infused water, it is known that from 30 respondents a small proportion of male and female respondents experienced an improvement in blood sugar levels with 3 respondents in women (23.1%) and 3 male respondents (17.6%). With almost the same percentage, it proves that okra infused water is effective in lowering blood sugar levels in both male and female sexes so that the consumption of infused water can be given to all genders.

Based on table 4.6 tabulation between age and blood sugar levels after giving infused water, it is known that from 30 respondents after being given okra infused water, all of the respondents aged 36-45 years have good sugar levels, namely 1 person (100%), a small percentage of respondents aged 46-55 years had good blood sugar levels, namely 2 respondents (28.6%) followed by a small proportion of respondents aged 56-65 years having good blood sugar levels, namely 3 respondents (13.6%). This shows that okra infused water is effective in reducing blood sugar levels in all age groups.

Based on the results of the statistical paired t test in (attachment 16) with SPSS 16.00 software which is used to analyze pre-test and post-test blood glucose levels with a significant level of = 0.05, the result is P = 0.000. This shows that H0 is rejected and H1 is accepted because the p value < = 0.05. This means that there is an effect of giving infused water okra (Abelmoschus esculentus) on decreasing blood glucose levels in patients with type II diabetes mellitus in Jengglungharjo Village, Responsibility gunung Tulungagung District in 2018.

Diabetes Mellitus is a chronic, progressive disease characterized by the body's inability to metabolize carbohydrates, fats and proteins, leading to hyperglycemia (high blood sugar levels) [12] A person is said to have diabetes if he has fasting blood sugar levels in venous plasma > 126 mg/dL and > 100 mg/dL in capillary blood, on blood sugar tests when venous plasma > 200 mg/dL and in capillary blood > 200 mg/dL. Blood sugar levels throughout the day vary which will increase after eating and return to normal within 2 hours [9]

IV. CONCLUSION

From the theory and facts above, it shows that there is a match between the facts and the theory which states that okra can lower blood glucose levels. Using another alternative, regularly consuming okra infused water can also reduce blood glucose levels so that blood glucose levels are always stable, which would be better if balanced with diet and regular exercise. If this is obeyed by people with diabetes mellitus, blood sugar levels will be in normal or stable limits.

V. ACKNOWLEDGMENT

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