http://ijnms.net/index.php/ijnms
e- ISSN: 2686-2123
p- ISSN: 2686-0538
ORIGINAL RESEARCH

EFFECTIVENESS OF DRY EXTRACT MAHONI SEED CONSUMPTION ON BLOOD SUGAR LEVEL IN DIABETES MELLITUS PATIENTS

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ABSTRACT

An increase in blood sugar levels caused diabetes mellitus, and various other health complications. One of the herbal therapy approaches can be used by consuming mahogany seeds which are believed to reduce blood glucose levels. The purpose of this study was to determine the effectiveness of consuming mahogany seeds to reduce blood sugar levels. This was a quasi-experiment with non-randomized control group pretest-posttest design conducted on March 24-26 2020. A sample of 22 respondents was divided into 2 groups: treatment group and control group selected by purposive sampling. The data was collected by observation. The data was analysed by Paired t-test. The treatment group before consuming the dry extract of Mahogany seeds (Mean=258.27; SD= 46.98), and after consuming the dry extract of Mahogany seeds (Mean= 185.36; SD= 38.85). In the control group, before consuming the extract of Mahogany seed ekring (Mean= 224.27; SD= 14.73), and after consuming Mahogany seed extract (Mean= 213.27; SD=6.75). It was statistically significant (p= 0.001). Consumption of dry extract of Mahogany seeds effectively reduces blood sugar levels in patients with Diabetes Mellitus. Consumption of mahogany seeds can be used as a complementary therapy in nursing to reduce blood sugar.

Keywords

Consumption Of Dry Extract Of Mahogany Seeds, Diabetes Mellitus

INTRODUCTION

Problems that often arise in people with Diabetes Mellitus is how to maintain blood glucose levels to stay controlled and avoid complications such as cardiovascular disease, blindness, amputation, disability and reduce the life expectancy of patients (Astuti, 2018; Kemenkes RI, 2013). One of the pillars of diabetes mellitus management is the use of synthetic anti-diabetic drugs, although the administration of drugs often cause side effects. Traditional medicine (herbal) by the community becomes an option in solving health problems because cultural factors are based on hereditary, belief in herbal medicine and the geographical environment of the community (Leonita & Muliani, 2015). It is necessary to use anti-diabetes drugs that are relatively cheap, accessible to the public and have few side effects. The use of herbal medicine can use parts of plants such as seeds, leaves, flowers, stems and roots that are then processed into herbal remedies (Suyono,

Sudoyo, Setyohadi, Alwi, & Simadibrata, 2006; Vinay Kumar, Ramzi S. Cotran, 2013). One alternative is to do research on herbal or traditional therapies that have the effects of hypoglycemia. Approach through the consumption of mahogany seeds that people believe empirically can lower blood glucose levels. The chemical content of mahogany seeds are flavonoids and saponins. Dried extract of mahogany seed methanol is able to repair pancreatic tissue thus increasing insulin secretion which impacts the absorption of blood glucose into cells to be converted into energy (Fauzia & Sumekar, 2016; Hajli, Tohir, & Syahbirin, 2011; Sahgal et al., 2009). Many research findings show the potential of mahogany seeds is still used in mice and little research conducted clinically in humans as well as the findings of herbal medicine mahogany seeds circulated and consumed by the public. So it takes clinical scientific studies to prove the benefits of mahogany seed consumption in lowering blood sugar levels of Diabetes Mellitus patients. In addition, geographical support in Nganjuk Regency that facilitates the planting of mahogany trees can be a strong factor supporting this research as one form of external research in terms of community empowerment to care for the environment and health. Therefore, research on herbal therapy by consuming dried extracts of mahogany seeds is expected to play a role in the prevention and treatment of diseases based on scientific evidence that will be carried out by researchers.

METHOD

This research is a quasi-experiment with the pretest-posttest design approach of a non-randomized control group. This research in Working Area of Nganjuk Health Center, for 3 days at 24th – 26th March 2020. The limitation in this research are patients with diabetes mellitus without complications of heart failure, kidney disease, and liver disorders.

The population of this research is 30 patients with diabetes mellitus was spreading in Nganjuk subdistrict. The sample of 22 respondents was divided into 2 groups: 11 respondents of the treatment group and 11 respondents of the control group selected by purposive sampling with inclusion and exclusion criteria.

The intervention of this research, the treatment group was given consumption of dried extract of Mahogany seeds in capsule form for 3 days, dose 3 times in one day, 30 minutes before meals and still take diabetes medication according to medical advice. The control group was given an explanation for staying on diabetes medication according to medical advice. Monitoring is carried out everyday by visiting respondent at respondent's house.

Collecting data in this research by observation and measurement of blood sugar levels, then documented in the observation sheet. Measurement of blood sugar levels using glucometry brand Easy Touch, which is performed before and after intervention in the treatment and control group. The Data analyzed using SPSS IBM version 20 with Paired t-test and Independent t-test because data distribution scale is normal.

The ethical problem is nursing research is a critical issue, because in nursing research they are related to humans. Health Research Ethics Committee Institut of Health Science STRADA Indonesia in the effort to protect the rights and welfare of research subjects of health, has reviewed carefully the protocol.

RESULTS

Table 1. Frequency Distribution of Blood Sugar Levels before Consuming Dried Mahogany Seed Extract In Diabetic Mellitus Patients.

Random Blood Sugar	Treatment Group		Control Group	
	N	%	N	%
High	11	100	11	100
Normal	0	0	0	0
Low	0	0	0	0
Amount	11	100	11	100
Average Random Blood Sugar (mg/dl)	258,27		224,27	
standard deviation	46,975		14,725	
Maximum value (mg/dl)	376		251	
Minimum value (mg/dl)	201		201	

Based on Table 1 above, it was found that 11 respondents in the treatment group, all had high random blood sugar levels before consuming mahogany seed dried extract which is 11 respondents (100%), While in the control group amounted to 11 respondents, also had high random blood sugar levels before consuming dried mahogany seed extract. All 11 respondents (100%). In the treatment group before consuming dried extract of Mahogany seeds obtained random average blood sugar levels is 258.27 mg /dl, Standard Deviation (SD) is 46.975, the highest random blood sugar levels is 376 mg / dl, and the lowest random blood sugar levels is 201 mg / dl. In the control group before consuming dried extract of Mahogany seeds obtained random average blood sugar levels is 224.27 mg/dl, Standard Deviation (SD) is 14,725, the highest random blood sugar levels is 251 mg/dl and the lowest random blood sugar levels is 201 mg/dl.

Table 2. Frequency Distribution of Blood Sugar Levels after Consuming Dried Mahogany Seed Extract In Diabetic Mellitus Patients.

Random Blood Sugar	Treatment Group		Control Group	
	N	%	N	%
High	1	9	11	100
Normal	10	91	0	0
Low	0	0	0	0
Amount	11	100	11	100
Average Random Blood Sugar (mg/dl)	258,27		224,27	
standard deviation	46,975		14,725	
Maximum value (mg/dl)	376		251	
Minimum value (mg/dl)	201		201	

Based on Table 2 above, it was found that 11 respondents in the treatment group. Almost all had Normal Random Blood Sugar Levels after consuming dried mahogany seed extract of 10 respondents (91%). While in the control group of 11 respondents, had Normal Random Blood Sugar Levels after consuming dried extract of Mahogany seeds in total, namely 11 respondents (100%). In the treatment group after consuming dried extract of Mahogany seeds obtained average Random Blood Sugar Levels were 185.36 mg /dl, standard deviation (SD) was 38,847, The highest Random Blood Sugar Level was 290 mg/dl, and the lowest Random Blood Sugar Level was 140 mg/dl. In the control group after consuming dried extract of Mahogany seeds obtained average Random Blood Sugar Levels were 213.27 mg/dl, standard deviation (SD) was 6,754, The highest Random Blood Sugar Level was 225 mg/dl and the lowest Random Blood Sugar Level was 205 mg/dl.

Table 3. Effectiveness of consuming dried mahogany seed extract against decreased

blood sugar levels in people with Diabetes Mellitus.

Random Blood Sugar	Treatment Group				Control Group			
	Pre		Post		Pre		Post	
	N	%	N	%	N	%	N	%
High	11	100	1	9	11	100	11	100
Normal	0	0	10	91	0	0	0	0
Low	0	0	0	0	0	0	0	0
Total	11	100	11	100	11	100	11	100
Paired t-test results, *p-value* = 0,000 ; α = 0,05								
Independent t-test results, *p-value* = 0,029 ; α = 0,05								

Based on table 3 above, it was found that in the treatment group random blood sugar levels before consuming dried extract of Mahogany seeds in total, 11 respondents had random blood sugar high category (100%). And after consuming dried extract of mahogany seeds almost entirely, 9 respondents had random blood sugar in the Normal category (91%). While in the random blood sugar control group before consuming dried extract of Mahogany seeds in total, 11 respondents had random blood sugar high category (100%). And after consuming dried extract of Mahogany seeds in total, 11 respondents also had a random blood sugar high category (100%).

Independent t-test results showed that there was a difference after the treatment and control group, with p-value = 0.029, p-value ≤ α = 0.05, while paired t-test results showed that there was a difference before and after in the treatment group, with ρ-value = 0.000, ρ-value ≤ α = 0.05 so that Ha received means consuming dried extracts of Mahogany seeds effectively to lower blood sugar levels in people with Diabetes Mellitus.

DISCUSSION

Treatment of Diabetes Mellitus patients is carried out in a long period of time and continuously, so it can have an impact on the patient's financial diabetes mellitus, because it requires a large cost of treatment. Mahogany is one of the plants believed and used by people in Indonesia as a treatment for Diabetes Mellitus (Budiman, 2013; Ernawati, 2013). The part used of Mahogany is the seed. The result of extracts in Mahogany seeds there are compounds namely flavanoids, alkaloids, antraquinons, cardiac glycosides, saponins, volatile oils and terpenoids that are proven to have antioxidant activity (De, Chatterjee, Ali, Bera, & Ghosh, 2011; Sahgal et al., 2009). Flavonoid content is used as an inhibitor of enzyme α-glycosidase so as to delay the absorption of glucose in the blood or improve glucose tolerance. Flavanoids are also able to stimulate glucose intake in peripheral tissues, regulate the active response of enzymes involved in carbohydrate metabolism mechanisms, and can perform insulin-like (insulinomimetic) activity by influencing insulin stimulus mechanisms (Shofia, Aulanni'am, & Mahdi, 2013). Saponin content serves to treat diabetes mellitus due to hypoglycemic effects of saponins stronger than generic antidiabetes drugs, while the content of alkaloids are effective to detoxify and prevent oxidants in tubuk because the body becomes alkaline (Sahgal et al., 2009) . The results of this study support research conducted by Ani Astutik (2017) which states that mahogany seeds are one of the herbal plants that can lower blood glucose in patients with diabetes mellitus because it has a better taste for the enzyme α-glucosidase and also has the ability as an astrigen, can precipitate proteins and form a protective layer of intestines, thus inhibiting glucose intake and blood glucose increase rate is not very high (Astuti, 2018). The results of this study were also supported by research conducted by Suryani et al. (2013) on the effect of administering methanol extract of Mahogany seeds in mice, obtained increased insulin levels and repair of pancreatic tissue

in mice (Suryani, Endang H, & Aulanni'am, 2013).

Based on the results of the study showed that consuming dried extracts of mahogany seeds is effective against a decrease in blood sugar levels in people with diabetes mellitus through the administration of capsules of dried mahogany seed extract given to people with Diabetes Mellitus with random sugar levels of high category for 3 days. The role of nurses in complementary therapy education is to complement herbal remedies in puskesmas pharmacies that are used to help lower the blood sugar pressure of patients. The solution for puskesmas is the development of toga cultivation to the community to plant medicinal plants at home, which is efficacious for the needs of family medicines.

CONCLUSIONS

Non-Pharmacological therapy approach can be one of the alternatives in the treatment of Diabetes Mellitus patients, namely through the consumption of dried extracts of Mahogany seeds as an effort to lower blood glucose levels.

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