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EFFECTS OF GEDI LEAVES STEW ON THE DECREASE OF BLOOD SUGAR LEVELS IN PATIENTS WITH DIABETES MELLITUS

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ABSTRACT

Diabetes mellitus (from the Greek word, diabainein, "see-through" or "fountain" and the Latin word mellitus, "sweetness") commonly known as diabetes is a disease characterized by elevated blood sugar levels continuously and varied, especially after eating. Gedi leaves (*Abelmoschus manihot*) is a type of leaves consumed as vegetables by the people of Micronesia such as Indonesia, especially the eastern part such as North Sulawesi, North Maluku and even Papua make the Gedi leaves as prime vegetable food supplement.

This study aims to determine the effect of Gedi leaves stew on the decrease of blood sugar levels in patients with diabetes mellitus in Ngoali Village, West Kao District. This study is an experimental research. The population in this study was 10 residents of the Ngoali village who suffer from diabetes mellitus divided into the intervention group (5 respondents) and the control group (5 respondents). The sampling technique used is nonprobability sampling.

The results showed that the percentage decrease in blood sugar levels in people with diabetes mellitus after administration of the Gedi leaves stew (the intervention group) are: good (60%) by three respondents, medium (40%) by two respondents, and high (0 %) by zero respondents.

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INTRODUCTION

According Riskesdas conducted by the Ministry of Health in 2007, North Maluku is a region with the highest prevalence of diabetes mellitus (DM) in Indonesia, at 11.1%. Of all the regencies and cities in North Maluku province, the city of Ternate is a city with the second largest prevalence of diabetes mellitus (DM) after North Halmahera with 16% of the total prevalence of diabetes in North Maluku, or 2% below the North Halmahera.

North Halmahera was the region with the highest prevalence, at 18% of the total prevalence of diabetes mellitus (DM) in North Maluku. Based on data from the Health Office of North Halmahera Regency, the number of people with diabetes mellitus (DM) in 2015 was 162 (North Halmahera Regency, Health Office, 2015).

Gedi plant is known by the people of North Sulawesi as a vegetable crop, which is usually mixed with the typical food of the city of Manado, named the Manado porridge (Tinutuan). Gedi plant consists of two types of red Gedi (*Abelmoschus manihot* L, *Medical*), which is usually used for the treatment of several diseases such as kidney failure, ulcers, and

cholesterol (Mamahit and Soekamto, 2010), and green Gedi (*Abelmoschus esculentus* L, *Medical*) which is used as a vegetable.

Based on the data and information above, the study focuses on patients with diabetes mellitus (DM). Therefore, the authors are interested in doing a study entitled "the effect of Gedi leaves stew on the decrease of blood sugar levels in patients with diabetes mellitus".

RESEARCH METHODS

The study design is a model or method used by researchers to conduct a study to provide direction on the course of the study (Darma, 2011). The design used in the study is "*quasi experimental pre-post test design*" involving the intervention group and the control group.

The study aims to determine changes in blood sugar levels before and after the Gedi leaves intervention. Assessments or observations on research are done twice, i.e. before and after the experiment (pre and posttest). Differences in pre and posttest are considered as the treatment effect (Arikunto, 2005).

The following chart illustrates the design of the study to be implemented

Table 1. Experimental Research Design with Pre-Post Test Approach

Group	Pre-Test	Treatment	Post-Test
Intervention	O.a	Gedi leaves	O1.a
Control	O.b	-	O1.b

Information:

X: Intervention (Gedi leaves)

Oa: Blood sugar levels before Gedi leaves consumption in the intervention group

Ob: Blood sugar levels in the control group at the beginning of the study

O1.a: Blood sugar levels after Gedi leaves consumption in the intervention group

O1.b: Blood sugar levels in the control group at the end of the study

SAMPEL

Sample is a part of a number of characteristics possessed by the population used for the study. (Mapanawang, 2016). The sampling technique used was *non-probability sampling* with a sample size of 10 divided into two groups: 5 respondents for the intervention group and 5 respondents for the control

group. The samples were selected based on inclusion and exclusion criteria.

INTERVENTION PROCEDURE

1. Intervention group

- Researchers ensure the respondents who would receive intervention procedures and introduce themselves to the respondents.
- Researchers explain to the respondent about the meaning, purpose, method, benefits, implementation time, and procedures of Gedi leaves stew intervention.
- Researchers provide the opportunity to the respondents for asking questions and give *informed consent*. Researchers asked respondents' signature as proof of consent that the respondents are willing to participate in research activities.

2. Control group

Patients in the control group received only health education without receiving the Gedi leaves stew intervention. Questionnaires were conducted twice, before and after the intervention.

RESULTS AND DISCUSSION

There were 10 patients with diabetes mellitus (DM) in the village of Ngoali consisting of three males and seven females. In terms of age, four people aged 43 years, two people aged 52 years, three people aged 62 years, and one person aged 68 years.

Analyses of the data used in this study were univariate and bivariate using SPSS. The univariate analysis in this study is the characteristics of the respondents such as age, gender, and education. Out of 10 respondents, four people (40%) aged 30-43, five people (50%) aged 50-62 years, and 1 person (10%) aged > 68 years.

The bivariate analysis was conducted with t-test in SPSS, including Pre-test and post-test in the control group, and the measurements before and after consuming Gedi leaves stew in the intervention/experiment group.

This test was conducted to identify the effect of Gedi leaves stew on the decrease of blood sugar levels by comparing the values before and after the treatment. The significance of the test results is determined based on the value of t-table test of 0.05.

Analysis of Blood Sugar Levels in Control group (pretest and posttest)

Table 2. Frequency Distribution of Respondents in Control group (pretest)

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Height >200 mg/dl	5	100.0	100.0	100.0

Table 3. Frequency Distribution of Respondents in Control group (posttest)

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Height >200 mg/dl	5	100.0	100.0	100.0

Analysis of Blood Sugar Levels in Experimental group (pretest and posttest)

Table 4. Frequency Distribution of Respondents in Experimental group (Pretest)

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Height >200 mg/dl	5	100.0	100.0	100.0

Table 5. Frequency Distribution of Respondents in Experimental group (Posttest)

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3	60.0	60.0	60.0
Normal 110-145 mg/dl				
Moderate 145-200 mg/dl	2	40.0	40.0	100.0
Total	5	100.0	100.0	

The above table shows that the percentage of the measurement results of the decline in blood sugar levels after consuming Gedi leaves stew are: three respondents (60%) were in Good category, two respondents (40%) were in Medium category, bringing to a total of five respondents (100%).

From the SPSS statistical test results using the T-test (Paired Sample T-Test), the following results were obtained:

- In the experiment group, t-value was 3.998 and the value of $\alpha = 0.016$
- In the control group, t-value was -2.138 and the value of $\alpha = 0.099$

Decision-making based on the comparison of the value of α , t-value and t-table

- If the value of $\alpha > 0.05$ and t-value is smaller than t-table, H_0 is accepted and H_a rejected (No effect).
- If the α value of < 0.05 and t-value is greater than t-table, H_0 is rejected and H_a accepted (There is an effect).

DISCUSSION

Diabetes is a disease in which glucose (simple sugar) in the blood is high because the body cannot release or use insulin adequately. The results of the study by South et al (2013) show that red Gedi leaves (*Abelmoschus manihot L, Medical*) contain secondary metabolite that is flavonoids (722.5 mg/Kg). This is consistent with the results of research by Pine et al (2012) which states that the levels of flavonoids in red Gedi leaves extract obtained by maceration is relatively high. Flavonoids in vegetables are secondary metabolites used for health.

Based on the results of the research, it is known that the extracts could have prevented the death of mice as a result of a seizure. It reinforces the use of Gedi flower extracts for seizures due to epilepsy, as an antidepressant, and the brain neurons protector. Through further examination of the brain of the mice, eight active flavonoid compounds were found. Because it contains flavonoids, Gedi fruit extract is widely used to treat diabetes and kidney failure.

CONCLUSION

Based on the results of research and discussion, it can be concluded that the experimental group showed the highest percentage result in a Good level, whereas the control group showed no difference between pretest and posttest.

Some of the compounds found in the Gedi leaves, for example flavonoid, have been shown to lower blood sugar levels in people with diabetes mellitus.

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