# THE EFFECTIVITY OF PARE TEA TO REDUCE THE BLOOD GLUCOSE LEVEL OF THEELDERLY PEOPLE WITH DIABETES MELLITUS IN *REKSO WERDO*INTEGRATED HEALTH POST (POSYANDU) OF WONOKROMO SUBDISTRICT SUROBOYO

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**Abstract**
Diabetes can spread throughout the ages, from children to the elderly. The benefit of pare for diabetes can effectively decrease blood sugar level. The purpose of this study was to determine the effectiveness of giving Pare tea on the decrease of blood sugar level in the elderly Integrated Health Post (Posyandu) of ReksoWerdo RW 03 WonokromoSubdistrict Surabaya. The study design was a Quasy-Experiment, with its population of all diabetes mellitus patients in ReksoWerdo Integrated Health Post (Posyandu), RW 3, WonokromoSubdistrict Surabaya. The sample was 19 people, divided into 2 groups: 10 treated group and 9 control group that were taken by probability sampling of simple random sampling technique. The independent variable was giving pare tea (Tere), and the dependent variable was blood sugar level. The data collection instrument was the observation sheet. The data processing included editing, coding, processing, cleaning, and tabulating. The data were analyzed by using Mann-Whitney test with $\alpha < 0.05$. The result showed that most of the treatment group experienced a decrease in blood sugar levels, while for the control group that did not drink pare tea, half of the respondents experienced an increase in blood sugar levels. The result of the analysis using Mann-Whitney Test obtained $\rho = 0.001 < \alpha$ (0.05), so H0 was rejected, it means that Pare Tea (TERE) was effective to decreaseblood sugar level. Pare Tea (TERE) was effective to decrease blood sugar level, so it is suggested for the respondents to consume pare tea to prevent continual diabetes.

***Keywords: Pare Tea, Blood sugar level***

## INTRODUCTION

Indonesia's health development is directed to achieve health problem solving for healthy living for every citizen in order to realize optimum health status. Health problems can be affected by lifestyle, diet, work environment, exercise and stress. Lifestyle changes, especially in big cities, lead to increased prevalence of degenerative diseases, such as heart disease, hypertension, hyperlipidemia, diabetes mellitus (DM) and others (Waspadji, 2009).

Diabetes Mellitus is a chronic disease taking year, if not well controlled, will lead to various complications both acute and chronic. The basic abnormality of this disease is the lack of the hormone insulin.

Global status report on NCD World Health Organization (WHO) in 2010 indicated that 60% was the cause of death of all ages in the world, due to non-communicable diseases. DM was ranked the 6th cause of death. About 1.3 million people died from diabetes and 4 percent died before the age of 70 years. In Year 2030 it was estimated that DM ranks the 7th cause of death in the world. While for Indonesia it was estimated that in 2030 the number of DM sufferers would reach 21.3 million people (depkes, 2015). Based on the results of interviews conducted at

posyanduPosyanduLansiaReksoWerdo RW 3 Wonokromo Village Surabaya there were 20 elderly who suffered from Diabetes Mellitus disease.

One of the ingredients which raise blood sugar level was the ingredient which contained Polypeptide P. Polypeptide P could be found in Pare. From the discovery of the university-of-NahdlatulUlama Surabaya students in 2016, granted fund forresearch with the title "Tere (Tea Pare insulin like)" so that the food can be preferred in the community especially diabet patients who require more insulin, therefore the pare was processed into pare tea.

Pare tea is a processed product practically consumable. It is a new, thoughtful, and necessary breakthrough utilizing natural ingredients. It was done to meet the increased needs of human life, especially in the field of health. This is the pare plant (Momordicacharanti) that has the potential to treat diabetes (Badan POM, 2004). Pare functions as the treatment of Diabetes. The benefit of Pare for Diabetes is to effectively lower blood sugar levels. This is because the polypeptide content has almost the same structure with the hormone insulin. In the body, this hormone will work to lower blood sugar levels when blood sugar levels rise

According to the researcher, this tea was feasible was tested to find out its effectiveness, because the lifestyle of diabetics, especially regarding consuming foods, could affect the healing process and inhibit the ability of daily life activities. In accordance with the above background the researcher was interested in conducting the research on the effectiveness of Pare on the decrease in blood sugar levels of the elderly with Diabetes Mellitus

## RESULTS

1. Distribution of respondents based on blood sugar level before being treated with tere (Teh Pare)
   a) Treated Group

Table 1 Distribution of respondents based on blood sugar level before being treated with Tere (Teh Pare) for those of the treated griup at PosyanduLansiaReksoWerdo RW 3 Kelurahan Wonokromo Surabaya

| Subject | Blood sugar level (mg/dl) | Frequency | Percentage (%) |
|---|---|---|---|
| Treated Griup | <200 | 4 | 40 |
| | >200 | 6 | 60 |
| | Total | 10 | 100 |

Table 1 showed that of the respondents of Treated Group before treated with tere (Teh Pare) most (60%) of the respondents had bkood sugar level of >200 mg/dl

b) Control Group

Table2 Distribution of respondents based on blood sugar level before treated with tere (Teh Pare) for those of Control group at Posyandu Lansia Rekso Werdo RW 3 Kelurahan Wonokromo Surabaya

| Subjects | Blood sugar level (mg/dl) | Frequency | Percentage (%) |
|---|---|---|---|
| Control Griup | <200 | 6 | 66,7 |
| | >200 | 3 | 33,3 |
| | Total | 9 | 100 |

Table2 shows that for Control Group before being treated with (Teh Pare), most (66,7%) of the respondents had blood sugar level of<200 mg/dl.

2. Distribution of respondents based on blood sugar level after being treated with tere (Teh Pare)

a). Treated Group

Table3 Distribution of respondents based on blood sugar level after being treated with tere (Teh Pare) for those of Treated Group in Posyandu Lansia

Rekso Werdo RW 3 Kelurahan Wonokromo Surabaya

| Subject | Blood sugar level | | | Total |
|---|---|---|---|---|
| | decrease | remain | rise | |
| Treated Group | 7 (70%) | 3 (30%) | 0 (0%) | 10 (100%) |

Table3 shows that of10 respondents of post Treated Grouphaving treatment of tere (Teh Pare) most (70%) of them experienced a decrease in blood sugar level.

b). Control Group

Table4 Distribution of respondents based on blood sugar after being treated with tere (Teh Pare) for those of Control Group at Posyandu Lansia Rekso Werdo RW 3 Kelurahan Wonokromo Surabaya

| Subject | Blood sugar level | | | Total |
|---|---|---|---|---|
| | decrease | remain | rise | |
| Cintril Group | 0 (0%) | 4 (40%) | 5 (50%) | 9 (100%) |

Table4 shows thatof 9 respondents of post Control Groupwith treatment of tere (Teh Pare) half (50%) of the respondents experienced a rise in blood sugar level.

3. Effectiveness of consuming teh pare (tere)on the blood sugar levelof the elderly with Diabetes at RW 03 Kelurahan Wonokromo Surabaya

Table 5 shows that of 10 respondents dringkingtere most (70%) of them experienced a decrease in blood sugar level, whereas of the 9 respondents not drinking teremost (55,6%) of the respondents experienced an increase in blood sugar level.

Table 5 Tabulation of cross treatment of tere on blood sugar level of the elderly with Diabetes Melitusat Posyandu Lansia ReksoWerdo RW 3 Kelurahan Wonokromo Surabaya

| treatment of tere | Blood sugar level | | | Total |
|---|---|---|---|---|
| | decrease | remain | rise | |
| Treated with tere (Teh Pare) | 7 (70%) | 3 (30%) | 0 (0%) | 10 (100) |
| Not treated with tere (Teh Pare) | 0 (0%) | 4 (44,4%) | 5 (55,6%) | 9 (100%) |

Based on the result of statistical test of*Mann-Whitney* using SPSS with a significance of $\alpha = 0,05$ showed the value of $\rho = 0,001$ in which $\rho < \alpha$, so $H_0$was rejected, meaning the the treatment with terewas effective to decrease the blood sugar level of the elderly with diabetes melitus atPosyanduLansiaReksoWerdo RW 3 Kelurahan Wonokromo Surabaya.

## DISCUSSION

### Blood sugar levels before consuming of tea pare (tere) (pre test)

On table 1 showed that before the treatment of pare (tere) tea, from 10 respondents, the most respondents(60%) had blood sugar> 200mg / dl, while control group (66,7%) had sugar Blood <200mg / dl.

Factors that affect blood sugar levels are; age, lack of exercise, too much consuming foods, high stress, emotion, and the impact of the drugs. (Fox & Kilvert, 2010). These factors cause high blood sugar levels so that increasing the risk of diabetes mellitus complications.

The first factor that affects the blood sugar level is age, more people getting old are more risky of occurrence of organ function disorder especially at production of hormones that the body needs. Based on the research, it showed

that the respondents, both of the treatment group and the control group, aged over 66 years. Elderly experiences many physical changes, especially the impairment of organ function. The impairment of organs which is associated with diabetes is reducing ofinsulin hormone production, moreover the elderly also experiences resistance of insulin. Guyton & Hall's (2014) said that insulin resistance of type 2 Diabetes Mellitus (DM) patients tends to increase at age above 30 years. This due to reducing of tissues of the body's sensitivity of insulin.

The second factor is exercise. Exercise is an helpul effort to increase tissues' sensitivity to insulin. During exercising,muscle cells will increase the need for glucose, so that cell absorption of glucose will increase and stimulate the pancreas to increase insulin production. This research indicated that 80% respondents of treatment group and 100% of control group actively conducting exercise. According to Corwin (2009) exercise will burn calories in the body. The movements during exercise requires sources of energy: glucose or sugar. Regular exercise means the process of burning sugar is also regular. Exercise also increases the use of glucose so that blood glucose levels will be going down. Exercises which conducted by respondents in this research are gymnastics. They are conducted twicea month on the first 2 weeks.

The third factor is the amount of consumed food. The increase of the amount of consumed food affects the blood glucose levels so it is important to do a diet for people who have diabetes mellitus. Diabetics can eat all foods but it is important to pay attention to the amount or size, restrain sugar and fat sometimes also restrain the consumption of salt. The results of the study showed that from 10 respondents in the treatment group, 60% of the respondents did not do diet or do meal management by reducing sweet and fatty foods, while in the control group, 55.6% respondents also did not do diet or do meal management

Meal management is as a pillar of diabetes control, it also prevent the occurrence of complications other diseases such as hypertension, myocardial infarction or other diseases. Food consists of carbohydrates, proteins, and fats. Glucose is primarily sourced from carbohydrates although protein and fat can also raise glucose. Carbohydrates are parsed down into glucose and get into the bloodstream so that blood glucose will increase. The pancreas continuallyreleases insulin. The pancreas is an endocrine gland that has a langerhans islets. Langerhans islets has four different types of cells: alpha cells (secreting glucagon hormones), beta cells (secreting insulin), delta cells (secreting somatostatin). After eating, glucose increases in the blood circulation and insulin secretion by the pancreas also increases. The main task of insulin is to regulate the transport of glucose from the blood into the cells so that glucose in the blood falls.

The fourth factor that affects blood sugar is drugs. Drugs are the fourth pillar in diabetes control. Drugs can help to stimulate the pancreas to produce insulin or it work by stimulating cells to respond to glucose. In this research, 88,9%of respondents in control group and 70% of respondents in treatment group did not consume drug. The drug for diabetics is known as a hypoglycemic drug. Hypoglycemic drugs have two classes namely sulfonylurea and biguanid. Sulfonylureas decrease blood sugar by stimulating insulin secretion from inside of the pancreatic beta cells, but this drug is not given during the night because it can cause hypoglycemia during sleep.

Blood sugar levels after consuming of tea pare (tere)(post test). Blood sugar levels in elderly with

diabetes mellitus at Posyandu Elderly Rekso Werdo RW 3 Wonokromo Village Surabaya change after consuming pare (tere) tea, especially in the treatment group. This research (in table 3) shows thatafter being given pare tea,70% of 10 respondents in treatment group experiences decreasing blood sugar level, while from 55,6% of 9 respondent in control group experience increasing blood sugar level.

Treatment by consuming of pare tea (tere) can be used in controlling blood sugar levels, this is because pare plants are estimated containing hypoglycemic bioactive compounds that are charantin. These compounds are classified as phytosterols or complex glycosides. Extract of pare is estimated may increase the rate of cell metabolism through increasing and using glucose by target cells whose effects are antidiabetic (Utami et al, 2003)

. In the control group, respondents did not experience changes in blood sugar levels but increasing blood sugar levels, this is because respondents only do gymnastics two times a month without controlling the consumption of food and drink

Meanwhile, In the treatment group, respondent who consumed the pare tea experienced decreasing blood sugar levels, this is because charantin and insulin polypeptide (insulin-like polypeptide) which are contained by the fruit, have components that resemble to sulfonylurea ( The oldest and most widely used as antidiabetic drugs). The benefits of charantin is to stimulate the beta cells of the body's pancreas glands to produce more insulin, besides increasing the deposit of glycogen sugar in the liver.

The process of making TERE (Pare Tea) is quite easy and simple. The process of making Pare tea is the same as making simplisia in general. They way are wet sorting, washing, slicing, drying, dry sorting and packaging. This research was done in RW 03 Wonokromo Village Surabaya by giving pare tea for once a day in 2 weeks. The way to serve pare tea were boiled water 250 cc, put pare tea dip into the glass / cangkir, poured hot water into the gelas / cangkir, stirred until turned greenish, TERE (pare tea) was ready to serve.

**Effectiveness of Stress Management (Benson Relaxation) on the decrease of blood sugar level in elderly with diabetes mellitus at Posyandu Lansia Rekso Werdo RW 3 Wonokromo Village Surabaya**

The result of the research by using Man Whitney Test to treatment group before and after giving pare tea (tere) showed effectiveness of pare tea (tere) on blood sugar level of diabetes mellitus patients which is seen of value of $\alpha = 0,05$ got $\rho = 0,001$ Where $\rho < \alpha$ then H0 is rejected means the giving of pare tea (Tere) effective against the degression of blood sugar levels in RW 03 Wonokromo Village Surabaya.

Giving of tea pare (tere) is an action that can be used to control sugar levels. The content of pare affects the metabolism of glucose. According to the POM (2004) pare accelerate the release of glucose by increasing glucose metabolism or incorporating it into fatty deposits. This is the activity of charantinthat stimulates the beta cells of the pancreas gland of the body to produce more insulin, The pare effect in decreasing blood sugar of mice is also estimated similar to the mechanism of insulin (Primary, 2011).

It is suggested that the family should be able to control the elderly's sugar level and provide pare tea(tere) to reduce the risk of continuing illness

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