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# THE IMPACT OF DIABETES EXERCISE ON BLOOD SUGAR LEVELS IN DIABETES MELLITUS PATIENTS

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## Abstract

Diabetes mellitus is one of unremitting diseases with increasing prevalence of patients. One of the non-pharmacological therapies in the treatment of diabetes mellitus is by diabetes gymnastics. It is a physical exercise that produces blood flow, more so more accessible receptors and receptors ended up more dynamic that will influence the diminish in diabetes sugar. The reason of this consider is to decide the impact of diabetes acrobatic on the diminish in blood sugar levels in people with diabetes mellitus at the Elderly Founded of South Sumatra Indonesia. This investigate employments Pre-Experimental inquire about plan with one bunch pretest and posttest plan approach. The populace of all patients with diabetes mellitus with a test of 25 individuals. Examining is done by purposive examining strategy. Information collection was done by measuring blood sugar some time recently and after diabetes exercise using GCU Easy Touch. The sample size was 25 respondents. The investigation utilized is Wilcoxon test. The comes about appeared that normal blood sugar level some time recently treatment was 300.16 mg /dL, and cruel of blood sugar level after treatment was 282.32 mg/dL. Blood sugar levels decreased by 23 mg/dL. The comes about appeared that there was a noteworthy impact of diabetic acrobatic on the diminish of blood sugar level with p esteem = 0.000. It is expected that the Indonesian Senior Society of South Sumatra can the administration of diabetes mellitus by expanding the recurrence of diabetes gymnastics three times per week.

**Keywords :** Diabetes Mellitus, Diabetic Exercise, Blood Sugar Levels

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## INTRODUCTION

In line with the current development of globalization, the pattern of disease in the world is changing. Infectious diseases and malnutrition are gradually decreasing, but on the other hand, degenerative

diseases are increasing sharply. This change in disease patterns is thought to be related to changing lifestyles , including diet and activity patterns. Eating patterns in cities have shifted from traditional diets that contain lots of carbohydrates and fiber from vegetables to instant diets. In addition, a very busy lifestyle with work results in no opportunity for exercise. These changes in diet and activity patterns are what trigger an increase in degenerative diseases, one of which is Diabetes Mellitus (Sudoyo, 2006 in Manan et al., 2013Based on information gotten from the wellbeing profile of South Sumatra area in 2010, the prevalence of patients suffering from Diabetes Mellitus in Palembang City was 22.79% compared to other regencies/cities in South Sumatra Province, such as Musi Banyuasin Regency which was only 1.03% and OKI Regency which was 1.42%. This is a very large number and is a very heavy burden for specialist/subspecialist doctors, or even all existing health workers, to handle alone (South Sumatra Health Office, 2010).

One component of diabetes management or control is physical exercise. Work out is exceptionally critical in diabetes administration since its impacts can lower blood glucose levels and decrease cardiovascular hazard variables. Exercise programs combined with weight loss have shown increased insulin sensitivity and reduced the need for pharmacological interventions. Physical exercise is very important in addition to increasing insulin sensitivity, it will also produce muscle contractility that increases glucose uptake by muscles so that blood sugar levels decrease. One form of physical exercise or sport that is right for diabetes is diabetes gymnastics (Smeltzer and Bare, 2010 in Manan, Zebua, & Ginting, 2013). Diabetes work out may be a physical work out as an exertion to avoid and control diabetes mellitus, and is one of the columns of diabetes mellitus administration in expansion to instruction, dietary treatment, and pharmacological intercession. The benefits of sports exercises for individuals with diabetes mellitus incorporate expanding the diminish in blood sugar levels, foreseeing weight by burning body calories so that blood glucose can be utilized for essentialness. Thus, sugar levels can decrease (Damayanti, 2013).

Diabetes exercise can cause a diminish in blood glucose, this is often since when doing physical work out there's an increment in glucose utilize by the muscles.Diabetes exercise is done to reduce and control blood sugar levels in people with diabetes mellitus, after being given diabetes exercise intervention, nearly all diabetes sufferers experienced a diminish in blood sugar levels, this can be since when doing work out there's an increment in glucose utilize by the muscles, work out is additionally to burn body calories so that blood glucose can be utilized for vitality. In controlling and lowering blood sugar levels are influenced by several other factors such as weight, education and age factors, by controlling diet patterns, increasing knowledge about health, providing physical exercise, namely diabetes gymnastics which can control and lower blood sugar levels as a second treatment capital (Sanjaya & Huda, 2014).

Medical attendants have an vital part in caring for individuals with diabetes mellitus, specifically being required so that physical work out can be done by patients appropriately. This is often in agreement with the part of medical attendants specializing in therapeutic surgery, to be specific as facilitators, benefit suppliers, persistent nursing organizers, teachers, advocates, and operators of alter (Handayani, 2016). Based on this foundation, analysts are fascinated by conducting inquire about to decide the impact of diabetes tumbling on irregular blood sugar levels in individuals with Diabetes Mellitus at the Indonesian Elderly Institution in South Sumatra.

There have been a few past ponders that back this think about, a ponder conducted by Witriyani (2016) which inspected the viability of diabetes mellitus tumbling in bringing down blood sugar levels in diabetes mellitus patients within the Kayumas Wellbeing Center Work Region appeared the impact of diabetes acrobatic on changes in blood sugar levels with an normal blood sugar level after diabetes acrobatic was 272.62 mg / dL with a standard deviation of 110.50 mg/dL and after treatment there was a diminish in blood sugar levels of 22.07 mg/dL. Another ponder conducted by Jano Sinaga (2011) on the impact of diabetes tumbling on blood glucose levels in Diabetes Mellitus patients within the Darussalam Medan Wellbeing Center work region in 2011 with the comes about of the investigation utilizing the t- subordinate test gotten a p esteem = 0.000 with an normal diminish in blood glucose levels of 18.03 mg / dl. This appears a basic affect between diabetes tumbling and blood sugar levels in diabetes mellitus patients. From different considers, normal work out is the suggested treatment, particularly for individuals with diabetes mellitus.

## MATERIALS AND METHODS

In this study, the focus of the study includes diabetes exercise variables as Independent variables, while blood sugar levels as Dependent variables. This study aims to determine the effect of diabetes exercise on blood sugar levels in Diabetes Mellitus patients at the Indonesian Elderly Institution in South Sumatra.

This study is a quantitative study using a Pre Experimental research design , while the design used is the one group pretest posttest design . This study has one group, before and after treatment, measurements or observations are carried out. In this study there is no comparison group or control group, but researchers can find out the difference in blood sugar levels of diabetes mellitus sufferers by conducting initial observations or *pretests* and final observations or after intervention. The population of this study were all exercise participants who routinely follow diabetes gymnastics on Mondays who suffer from diabetes mellitus at the Elderly Institution. Indonesia South Sumatra who take part in regular diabetes gymnastics every Monday, totaling 50 individuals. The testing method in this consider was purposive examining, namely the selection of samples according to the objectives of the researcher

in the thesis that met the research criteria (Nursalam, 2008 in Notoadmodjo, 2010). The test in this think about was a few of the work out members who routinely taken part in diabetes exercise on Mondays who suffered from diabetes mellitus at the Indonesian Elderly Institution in South Sumatra. Observation Sheet Instrument, Blood Glucose *Test*.

## RESULTS AND DISCUSSION

### Normal Blood Sugar Levels Some time recently Doing Diabetes Mellitus Works out

*Table 1. Normal Blood Sugar Levels Some time recently Doing Diabetes Mellitus Works out*

| Variables | Mean | Median | Sd | Min –Max | 95% Ci |
|---|---|---|---|---|---|
| *Pretest* | 300.16 | 301.00 | 46,095 | 232 - 392 | 281.1 3 - 319.1 9 |

Table 1 shows that average *pretest* Sunday First that is as big as 300.16 mg/dL. Mark minimum level sugar blood *pretest* Sunday First on Respondent namely 232 mg/dL and maximum value as big as 392 mg/dL. Results estimate interval can concluded 95% believed that level sugar blood average Respondent is 281.13 mg/dL – 319.19 mg/dL.

### Average Blood Sugar Levels After Doing Diabetes Mellitus Exercises

*Table 2. Average Blood Sugar Levels After Doing Diabetes Exercises*

| Variables | Mean | Median | Sd | Min –Max | 95% Ci |
|---|---|---|---|---|---|
| *Pretest* | 282.32 | 278.00 | 46,098 | 218 - 378 | 263.29 - 301.35 |

Table 2 shows that average mark sugar blood *posttest* second week which is 282.32 mg/dL. Mark minimum level sugar blood *posttest* Sunday second that is 218 mg/dL And mark maximum as big as 378 mg/dL. Results estimate interval can concluded 95% believed that level sugar blood *posttest* Sunday second average Respondent is 263.29 mg/dL – 301.35 mg/dL.

### Changes in Blood Sugar Levels After Doing Diabetes Mellitus Works out

*Table 3. Changes in Blood Sugar Levels After Doing Diabetes Mellitus Works out*

| Blood Sugar Levels | Frequency | Percentage (%) |
|---|---|---|
| Go on | 3 | 12 |
| Down | 22 | 88 |
| Total | 25 | 100 |

From 25 Respondent 22 Respondent among them experience decline level sugar blood. Decrease level sugar blood This can seen from a number of matter that is due to by gymnastics participants. Gymnastics movements that done cause contractility muscle, sensitivity insulin, And cause increasing flow blood (Manan, Zebua, & Ginting, 2013). The average decrease in blood sugar levels after diabetes exercise in this study is in accordance with the opinion of Chaveau and

Kaufman in Ilyas (2007) who expressed that physical work out can specifically cause an increment in glucose utilize by dynamic muscles. Regular physical exercise causes increased membrane permeability in contracting muscles so that insulin resistance decreases and insulin sensitivity increases.

Increased blood sugar levels are also caused by irregular diabetes exercise. Of the three respondents who experienced increased blood sugar levels , two of them did not regularly follow the exercise schedule. This is also caused by the diabetes exercise schedule which is only done once a week. Of course, this does not meet the principles of physical work out for individuals with diabetes melitus, which is 3-5 times a week (Suyono et al., 2009 in Manan, Zebua, & Ginting, 2013). This can also be caused by physical activity, insulin sensitivity increases, which causes a decrease in plasma blood sugar levels and to restore plasma blood sugar levels the body secretes the hormone glucagon. During exercise, glucose and fatty acids are simultaneously needed for the body's metabolic processes, so glucagon levels increase and insulin decreases. Therefore, insulin may not play a role in increasing blood sugar transport into working muscles (Guyton, 2008).

**Brivariate Analysis**

Bivariate analysis is intended to determine the research hypothesis, namely whether there is an effect on blood sugar levels some time recently and after diabetes work out. The normality results obtained significant values at the time of the first week pretest of 0.078 and the second week posttest of 0.007. Hence it can be concluded that as it were the primary week pretest information is ordinarily conveyed since the esteem is over 0.05. Therefore , the bivariate analysis used is the Nonparametric test, namely the Wilcoxon test.

*Table 4. Influence Exercise Diabetes Against Lowering Sugar Levels Blood On Sufferer Diabetes Mellitus in Elderly Institutions Indonesia South Sumatra*

| Variable | Medium<br>Min - Max | P<br>Value |
|---|---|---|
| First week pretest(n=25) | 301<br>232-392 | 0,000 |
| Second week posttest (n=25) | 278<br>218-378 | |

It is known from table 4 that the p esteem of the Wilcoxon test for pretest and posttest blood sugar levels is 0.000 (p< 0,05). which implies Ha is acknowledged. Hence, there's a noteworthy contrast between some time recently and after diabetes work out on decreasing blood sugar levels in diabetics at the Indonesian Elderly Institution in South Sumatra.

## DISCUSSION

Diabetes mellitus is one of the foremost common sorts of malady undermine man. Amount diabetes mellitus sufferers within the world from year to year involvement increment. WHO data in the year 2012 show that amount diabetes mellitus sufferers in the world recorded 347 million And 80 % among them die in country develop (WHO, 2013). Exercise physical is beginning management in prevent, control, and overcome diabetes mellitus. Ilyas in Soegondo (2007) explain that exercise physical cause the occurrence improvement flow blood, nets capillary more Lots open so that more Lots available receptor insulin become more activeWhich will influential to decline glucose on blood sufferer diabetes mellitus.

Results study Which has done by Erlina (2014) show that from 10 respondents in the intervention group obtained p esteem =0,000 more littler than the value α = 0.05 which implies There's impact to level sugar blood, while from 10 respondents in the control group *p was obtained value* = 0.004 Which more small from0.005 Which means There is influencealso, where it falls into the category tall. The results of the research conductedWitriyani (2016) with title effectiveness exercise diabetes in lower level sugar blood onsufferer diabetes mellitus in region Work health center Kayumas. The normal blood sugar level within the mediation gather amid the pretest was 294.69 mg /dl, whereas the normal blood sugar level amid the posttest was 272.62 mg/dl. According to Agus F. Sanjaya and Miftahul Huda (2014 ), there was a diminish in blood sugar levels some time recently and after diabetes work out of 29 mg/dl, meaning that there was an effect of diabetes exercise on reducing blood sugar levels in diabetes mellitus sufferers in the Peterongan Jombang Health Center Work Area.

This can be in line with the comes about of information examination showing that the normal blood sugar level within the mediation gather amid the pretest was 301 mg/dl, whereas the normal blood sugar level amid the posttest was 278 mg/ dl. These comes about show that there was a diminish in pretest and posttest blood sugar levels of 23 mg/dL. The comes about of the p esteem investigation of the Wilcoxon test for pretest and posttest blood sugar levels were 0.000 ($p<0.05$ ) which implies Ha is acknowledged.. Thus, there's a critical contrast between before and after diabetes gymnastics on reducing blood sugar levels in diabetics at the Indonesian Elderly Institution in South Sumatra. According to researchers, diabetes work out is exceptionally critical as one of the non-pharmacological medicines for diabetes mellitus sufferers. The benefits of diabetes work out for diabetes mellitus sufferers are to lower blood sugar levels , avoid weight by burning body calories so that blood glucose is utilized as vitality. Thus, blood sugar levels in diabetes sufferers can decrease.

## CONCLUSION

Based on a ponder conducted on 25 respondents on the impact of diabetes tumbling on blood sugar levels in diabetes patients at the Indonesian Elderly Institution in South Sumatra, it can be concluded that the comes about of the ponder appeared that the average blood sugar level some time recently diabetes tumbling within the to begin with week was 300.16 mg /dL with a middle esteem of 301 mg/dL, a least esteem of 232 mg/dL and a most extreme esteem of 392 mg/dL. Where the normal blood sugar level after diabetes tumbling was 282.32 mg /dL with a middle esteem of 278 mg/dL, a least esteem of 218 mg/dL and a most extreme esteem of 378 mg/dL..

There is a significant difference between the average blood sugar levels before and after diabetes exercise with a median difference of 23 with a p value in the Wilcoxon test of 0.000 <α (0.005), which means that there is an effect of diabetes exercise on reducing blood sugar levels in people with diabetes mellitus at the Indonesian Elderly Institution in South Sumatra in 2018.

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**Declaration of Interest Statement**

The analyst expressed that there was no struggle of intrigued amid the conduct of this investigate.

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