

# The Influence Of Gymnastics Diabetic Foot To Decrease Blood Sugar Levels In Patients With Type 2 Diabetes Mellitus

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## Abstract.

*Diabetes mellitus is a group of symptoms that arise in a person caused by an increase in blood glucose levels due to reduced insulin secretion are progressive background by the retention of insulin. Gymnastics diabetic foot is needed in the management of diabetes mellitus, regular physical exercise can lower blood sugar levels. To examine the effect of diabetic foot gymnastics to decrease blood sugar levels in patients with Diabetes Mellitus as type 2 Clubs Prolanis Sanang Barigas BPJS Palangkaraya. Method This study is a quantitative research study design Preexperimental Design, the design of the study one-group pre-post-test design. The number of respondents 30 people. Retrieving data using a questionnaire and analyzed using SPSS. Statistical test using the Wilcoxon Signed Rank Test. Results Statistical test results obtained Wilcoxon Signed Rank Test average value (mean) pretest / before gymnastics at 6:06 and posttest leg / foot after gymnastics at 18.93 while the value of the probability p value or sig. (2-tailed)  $0.00 < 0.05$  (0.00 less than 0.05) so that  $H_0$  refused and  $H_a$  accepted which means there is a significant difference between random blood sugar levels before and after exercisefeet. Conclusion regular physical exercise and the effect on blood sugar levels drop as in patients with type 2 diabetes mellitus in prolanis club Sanang barigas BPJS Palangkaraya. so that exercisers diabetic foot is needed in the management of diabetesmellitus.*

**Keywords:** Diabetic Foot Gymnastics, Blood Sugar, DiabetesMellitus

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## I. INTRODUCTION

Diabetes mellitus is a group of symptoms that arise in a person caused by the presence of elevated levels of blood glucose due to decrease in insulin secretion is progressive which is triggered by the retention of insulin [1]. Diabetes Mellitus is a disease that has complications or cause the occurrence of other diseases that most [2].

According to the International Diabetes Federation (IDF), the prevalence of diabetes mellitus is 1.9% and has made the DM as a disease cause of death. the number seven in the world. In the year 2012 the incidence of DM in the world is 371 million people where the proportion of type 2 DM was 95%. The incidence of DM increased to 382 million in 2013 and by 2035 is expected to increase to 592 million persons. Based on the latest data Riskesdas 2018, in general figures the Prevalence of Diabetes Mellitus by Physician Diagnosis in the Population of All ages which is 1.5 percent with a total of 1.017.290 patients with diagnosed Diabetes Mellitus. The prevalence of Diabetes Mellitus in Central Kalimantan on all the life that is 1.1 percent with a total of 10.189 patients with diagnosed Diabetes Mellitus and at the age of  $\geq 15$  years to 1.6 percent dengantotal

7.031 undiagnosed Diabetes Mellitus. (Riskesdas, 2018)

In the city of Palangka Raya the Client with diabetes who come and go to the clinic increased quite sharply in the last 6 years, if in 2016 as many as 1372 is patient and in the year 2017meningkat sharp as 3.228 (Health Profile of the City of Palangka Raya 2017). Club Prolanis Sanang Barigas BPJS Kesehatan Palangka Raya. There are 85 active members. This club has members with a number of DM as much as 24 people and

DM with Hypertension as many as 61 people.

Components of physical exercise or sport is very important in the management of Diabetes due to its effect can lower blood glucose levels by increasing glucose uptake by muscle and improve the use of insulin. Physical exercise will cause an increase in blood flow, it will be more meshes of the capillaries open so that more of the available insulin receptors and the receptors become active which will affect the decrease in blood glucose in Diabetic patients (Panggabean, 2013). Physical exercise or sports the recommended one is the gymnastics of the foot Diabetes Mellitus. Legs gymnastics aims to improve blood circulation so that nutrients to the tissues more smoothly, strengthen the small muscles, calf muscles and thigh muscles, lower the blood sugar levels as well as overcome the limitation of motion of the joints experienced by people with Diabetes Mellitus.

The results of this study showed that elderly people who experienced diabetes mellitus, in the group given the intervention of gymnastics feet their blood sugar levels decreased compared to the group not given the intervention of gymnastics feet. This shows the influence of gymnastics feet in lowering blood sugar levels. Decrease blood sugar levels this as one indication of the occurrence improves diabetes mellitus that experienced. Therefore, the provision of the activity of the legs gymnastics is one of the effective way in managing diabetes mellitus. According to Research Rusli and Farianingsih in 2015, gymnastics feet diabetes lower blood sugar levels patients with diabetes mellitus type 2 Sample yang diambil as many as 20 respondents. The research was conducted in Puskesmas masa depan December 2014. Physical exercise in addition to maintain fitness can also lose weight and improve insulin sensitivity, so it will improve the control of the glukosadarah. According to Research Sulistyowati in the year 2017, the influence of gymnastics the legs to the blood sugar levels as in patients with diabetes mellitus of type II in region work puskesmas cawas 1, the Sample in this study was 32 patients with DM type II in region Work Puskesmas Cawas 1, the Results of this study show that patients with blood sugar levels sewaktunya decreased. This shows there is the influence of gymnastics feet in lowering blood sugar levels as. Reduction in blood sugar levels as this as one indication of the occurrence of improvement of diabetes mellitus experienced. Therefore, the provision of the activity of the legs gymnastics is one of the effective way in managing diabetes mellitus.

## II. METHODS

This research is a quantitative research with a research design Preexperimental Design, Using a study design one - group pre-post-test design, namely the group of subjects observed before the intervention, and then observed again after the intervention (Hidayat, A. Aziz Alimul, 2009). Blood sugar levels before and after the intervention done the assessment to see the effect of exercise diabetic foot to decrease blood sugar levels as in patients with Diabetes Mellitus type II in the Club Prolanis Sanang Barigas BPJS Kesehatan Palangka Raya by the Number of respondents is 30 people. Retrieval of data using questionnaires and analyzed using SPSS. Test ujiiliah rank signed Wilcoxon test.

## III. RESULT

### Univariate Analysis

**Table 1.** Characteristics of Respondents By gender on the club  
Prolanis Sanang barigas BPJS Health  
Palangkaraya, 2019, ( n = 30 )

Gender	Total ( f )	Percent (%)
Men	13	43,3
Women	17	56,7
Total	30	100

In table 1 it is known that from 30 respondents who researched the female gender more that 17 people (to 56.7%), while respondents gender male consists of 13 people (43,3%).

**Table 2.** Characteristics of Respondents Based on age on the  
In the Club Prolonis sanang Barigas BPJS Health

Palangkaraya Tahun 2019 ( n = 30 )

No	Age	Total (f)	Percent (%)
1	46-50 Year	6	20,0
2	51-55 Year	7	23,3
3	56-60 Year	7	23,3
4	61-65 Year	4	13,3
5	66-70 Year	6	20,0
	Total	30	100

In table 2 note that from the 30 respondents studied most of the life span of 45-50 years, as many as 6 respondents (by 20.0%), 51-55 years as much as 7, (23,3%), 56-60 years as much as 7 (23,3%) 61-65 years as many as 4 (13.3%) and 66-70 years as many as 6 (20,0%).

## Discussion

The respondents in this study are Members of Prolanis Sanang Barigas BPJS Health Palangkaraya totaling 30 respondents most of the female gender as many as 17 respondents (56.7%) men and 13 respondents (43,3%). According to Ahmad Alghadir, et al (2012), that the prevalence of occurrence of diabetes mellitus is higher in women compared with men.

The Data are consistent with the research Indriyani (2007) who stated that diabetes mellitus at the age of 40 – 70 years is more common in women, Whereas in men is more common at a younger age. It is triggered by hormonal fluctuations during syndrome the monthly cycle (pre-menstrual syndrome) and post-menopause in women make the distribution lemak menjadi easily accumulated in the body so that the body mass index (BMI) increased with the percentage of fat is high which ranges from 20-25% of body weight total and LDL levels that are high compared to men who generally have the amount of fat ranges from 15-20% of total body weight (Karinda, 2013; Irawan, 2010 in Trisnawati, 2013;

Jelantik, 2014). The average age of respondents in this study namely age of 45-50 years, as many as 6 respondents (20.0%) of, 51-55 years as many as 7 (23,3%), 56-60 years sebanyak 7 (23,3%), 61-65 years as many as 4 (13,3%) and 66-70 years as many as 6 (20,0%).

According to the Sudoyo (2009), those with age more than 45 years adalah kelompok age who are at risk of suffering from Diabetes Mellitus. Age is one risk factor one can experience Diabetes Mellitus, because of the increasing age of the individual will increasingly experience a decline in body function (degenerative), especially disorders of the organs of the pancreas produce the hormone insulin. More it is said that the DM will increase the case in line with the increase of age so patients with age more than 45 years more often come to the health facilities. The Data are consistent with the research Alfiyah also found that there is a relationship between age with Diabetes Mellitus (Alfiyah, 2010) Based on the type of work of respondents the results showed most of the respondents are CIVIL servants that is as much as 1 respondent (3.3 percent) retired CIVIL servants as many as 7 respondents (23,3%), IRT as many as 7 respondents (23,3%), and the private sector as many as 15 respondents (50,0%). The discussion about the types of job particularly in patients with DM type 2 are associated with the activity of day-to-day, so that it can reduce the risk of complications such as cardiovascular problems and enhance life expectancy as well as improve a sense of comfort in physical, psychological and social (Soegondo, 2009). Research in Singkawang city provides the result that the distribution of patients with Type 2 DM is the largest of the group do not work by 46,2% (Mihardja, 2010). An overview of the level of education is based on the history of formal education last attended by respondents. The results of the analysis show that the most educated respondents SD as many as 11 respondents (36,7%), yang berpendidikan. Junior high school as much as 9 respondents (30,0%), high School-educated as much as 4 respondents (13.3%) and S1 as many as 8 respondents (20.0%) of The educational background of respondents level high School it is expected that it will be easier in receiving information related to the management of type 2 DM and prevent the onset of complications.

The Data are consistent with Research about risk factors for Type 2 DM in the City of Singkawang ever conducted by Mihardja. The level of education most are Not finished primary school (27,9%), completed ELEMENTARY school (25.0 percent), and never school (15,0%) (Mihardja, 2010). Research

conducted by Fatmawati get that that the level of education are factors associated with the incidence of Type 2 Diabetes Mellitus (Fatmawati,2010). Based on the results of the research that has been carried out it is known that from the 30 respondents the results of the evaluation of gymnastics leg members prolans on the first day of the largest presentation in the good category with the presence 53,3%, Based on the results of the research that has been carried out it is known that from the 30 respondents the results of the evaluation of gymnastics leg members prolans on day-two of the largest presentation in the good category with the presence 53,3%,. Based on the results of research that has been conducted it is known that from 30 of respondents the results of the evaluation of gymnastics leg members prolans on day three the largest presentation in the good category with the presence 83,3%

The results of this study showed a decrease in blood sugar levels as done after 4 times of gymnastics the legs are evidenced in the table 4.9 it is known that from the 30 respondents studied, the obtained values of the average (mean) pretest/before gymnastics feet of 6.06 and posttest/after gymnastics feet of 18.93 while the probability value p-value or sig. (2-tailed)  $0,00 < 0,05$  (0,00 less than 0.05) and there is the value of the average reduction in blood sugar levels of the respondents for 4 days done gymnastics feet that is 37,73, and the standard deviation or closeness of individual data to the value of the rat-average of 45,285. so  $H_0$  is rejected and  $H_a$  accepted which means that there is a significant difference between blood sugar levels when before and after the legs gymnastics, so gymnastics diabetic foot effect on reduction in blood sugar levels as in patients with type 2 diabetes mellitus.

According to research Priyanto in the year 2012, the influence of gymnastics feet of the sensitivity of the feet and blood sugar levels on the aggregate of the elderly diabetes mellitus in magelang, the Sample used in this study was 125 respondents, which consists of 62 respondents in the intervention group and 63 respondents in the control group. The results of this study showed that elderly people who experienced diabetes mellitus, in the group given the intervention of gymnastics feet their blood sugar levels decreased compared to the group not given the intervention of gymnastics feet. This shows the influence of gymnastics feet in lowering blood sugar levels. Decrease blood sugar levels this as one indication of the occurrence of improves diabetes mellitus experienced. Therefore, the provision of the activity of the legs gymnastics is one of the effective way in managing diabetes mellitus.

According to Research Rusli and Farianingsih in 2015, gymnastics feet diabetes lower blood sugar levels patients with diabetes mellitus type 2 Sample yang diambil as many as 20 respondents. The research was conducted in Puskesmas masa depan December 2014. The results of the research that there is a strong influence of gymnastics feet. Diabetes to decrease blood sugar levels in patients with type 2 diabetes mellitus. Gymnastics of diabetic foot is needed in the management of diabetes mellitus, physical exercise regularly can reduce blood sugar levels. Physical exercise in addition to maintain fitness can also lose weight and improve insulin sensitivity, so it will improve the control of blood glucose. According to Research Sulistyowati in the year 2017, the influence of gymnastics the legs to the blood sugar levels as in patients with diabetes mellitus of type II in region work puskesmas cawas 1, the Sample in this study was 32 patients with DM type II in region Work Puskesmas Cawas 1, the Results of this study show that patients with blood sugar levels sewaktunya decreased. This shows there is the influence of gymnastics feet in lowering blood sugar levels as. Reduction in blood sugar levels as this as one indication of the occurrence of improvement of diabetes mellitus experienced. Therefore, the provision of the activity of the legs gymnastics is one of the effective ways in managing diabetes mellitus.

#### IV. CONCLUSION

Based on the results of research that has been done in the Club Prolans Sanang Barigas Bpjs Kesehatan Palangka Raya then can be drawn kesimpulan bahwa:

Characteristics by gender in the Club Prolans Sanang Barigas Bpjs Kesehatan Palangka Raya most on the women from the 30 respondents. The characteristics by age in the Club Prolans Sanang Barigas Bpjs Kesehatan Palangka Raya most at the age of 51-

60 years of the 30 respondents. Characteristics based on the work in the Club Prolans Sanang Barigas Bpjs Kesehatan Palangka Raya on the self-employed from 30 respondents. Characteristics based on

the education in the Club Prolanis Sanang Barigas Bpjs Kesehatan Palangka Raya most on SD than 30 respondents. Blood sugar levels before gymnastics diabetic foot obtained with a mean 6,06. Blood sugar levels after gymnastics diabetic foot obtained with a mean 18,93. Based on the test statistics of the Wilcoxon Signed Rank Test obtained  $p$  value=0,00 ( $p < 0,05$ ) so that based on the statistics value is meaningful and it can be concluded that there is a difference. significant correlation between blood sugar levels when before and after the legs gymnastics, so gymnastics diabetic foot is needed in the management of diabetes mellitus, physical exercise regularly and the effect on reduction in blood sugar levels as in patients with diabetes mellitus type 2 in the club prolanis sanang barigas bpjs health palangkaraya.

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