



Effect of Brisk Walking Exercise on Blood Sugar Levels in Prolanis Members at Community Health Center

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ABSTRACT

Many diabetes mellitus sufferers still lack regular physical activity. Physical activity such as brisk walking can be a form of exercise that effectively controls blood sugar levels. This study aims to determine the effect of brisk walking on random blood sugar levels in Prolanis in the Kesamben Community Health Center working area, Jombang Regency. The research design uses a pre-experiment with a one-group pre-post-test design approach. The population of Prolanis members was 35 respondents, and the sample size was 20 respondents taken using non-probability purposive sampling. The independent variable is brisk walking, the dependent variable is random blood sugar levels, data collection uses the GlucoDR blood sugar checking tool, and the statistical test used is the Wilcoxon Test analysis. The research results showed that of the 20 respondents, the majority, namely 15 (75%), were in the high category before being given the fast walking treatment. On the other hand, most respondents were in the moderate category after fast walking exercise, namely 15 respondents (75%). The results of the Wilcoxon statistical test show $p\text{-value} = 0.002$ where $p\text{-value} < \alpha (0.05)$. It can be concluded that brisk walking affects random blood sugar levels. Brisk walking exercise affects changes in random blood sugar levels in Prolanis in the Kesamben Community Health Center working area, Jombang Regency. Brisk walking is recommended as a type II diabetes management therapy to control blood sugar levels because of the low side effects, and it has been proven to be effective.

Keywords: Brisk Walking, Blood Sugar Levels, Diabetes, Exercise

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I. INTRODUCTION

The problem of lazy and unhealthy lifestyles, including lack of physical activity, often occurs in the modern era. In people with diabetes mellitus (DM),

physical activity is one of the pillars of managing blood glucose levels. However, in reality, many people, especially DM sufferers, still lack regular physical activity (Codella, 2017).

According to the International Diabetes Federation (IDF), The global diabetes prevalence in 2019 is estimated to be 9.3% (463 million people), rising to 10.2% (578 million) by 2030 and 10.9% (700 million) by 2045 (Saeedi et al, 2019). Meanwhile, Based on Basic Health Research (RISKESDAS) conducted by Ministry of Health, Indonesia, prediabetes prevalence tends to increase from 2007 until 2018 (Kementerian Kesehatan RI, 2019). In 2019, Indonesia was ranked 6th in the number of DM sufferers, reaching 10.3 million (PERKENI, 2021). Meanwhile, in Jombang Regency in 2016, diabetes mellitus, including non-communicable diseases (PTM), was included in the top 3 ten diseases most commonly found and treated in community health centers. The number of sufferers reached 16,490 people.

Environmental impacts and unhealthy lifestyles, such as overeating, fatty foods, lack of physical activity, and stress, play a significant role in triggering diabetes (Kurdi, 2021). Heredity is a factor that cannot be prevented. However, lifestyle can be changed, such as maintaining an ideal body, controlling fatty and sweet foods, and increasing sports activities. Physical activity is also very influential, where the success rate in treating DM reaches 40% (Colberg, et al). Physical exercise has a vital role in DM

sufferers. The consensus on the management and prevention of type 2 DM from PERKENI in 2011 determined that the physical exercise program carries out daily physical activity and regular physical exercise 3-4 times a week for approximately 30 minutes (PERKENI, 2015).

One type of exercise that is recommended for diabetes sufferers is brisk walking, which is a type of aerobic exercise that aims to improve body health and fitness, especially by increasing the function and efficiency of the body's metabolism so that it will improve body health and fitness (Morita et al, 2019). This aligns with research by Bailey and Locke (2015) that shows that diabetes sufferers can exercise by walking for 30 minutes and brisk walking for 20 minutes. Brisk walking is recommended because this exercise is practical, easy to do anywhere, anytime, and cost-effective.

Based on the description above, researchers are interested in finding out the effect of brisk walking exercise on random blood sugar levels in Prolanis DM sufferers in the Kesamben Community Health Center, Jombang Regency working area.

2. METODE

This research is pre-experimental with a one-group pre- and post-test design

approach. The population is 35 members of Prolanis who suffer from DM in the working area of the Kesamben Community Health Center, Jombang Regency. The sample size of 20 people was obtained using a purposive sampling technique. The independent variable is brisk walking exercise, and the dependent variable is random blood sugar levels. The place and time of the research were carried out in the

work area of the Kesamben Community Health Center, Jombang Regency.

In this study, respondents doing brisk walking exercise in 3 sessions, each 20-30 minutes for one week. Meanwhile, random measurements of blood sugar levels were carried out before and after each brisk walking training session using a blood sugar checker (GlucodR easy touch). The data obtained were analyzed using the Wilcoxon Signed Ranks Test.

3. RESULTS

Table 1. Frequency distribution based on blood sugar levels before brisk walking exercise on people with diabetes mellitus on Prolanis

No	Blood Sugar Levels	Before		After	
		Frequency	Percentage (%)	Frequency	Percentage (%)
1.	Normal	0	0	0	0
2.	Moderate	5	25	15	75
3.	High	15	75	5	25
Total		20	100	20	100

Table 1 shows that of the 20 respondents, the blood sugar levels before doing brisk walking were mainly (75 %) in the high category, numbering 15

respondents, and the 20 respondents' blood sugar levels after doing brisk walking, most (75 %) were in the medium category, numbering 15 respondents.

Table 2. Frequency distribution a change blood sugar levels after brisk walking exercise on people with diabetes mellitus on Prolanis

No.	Changes in blood sugar levels	frequency	Percentage (%)
1	Increase	0	0
2	Decrease	10	50
3	Nothing changed	10	50
Total		20	100

Table 2 shows that after giving intervention a brisk walking exercise, there

was a change in blood sugar levels in 10 respondents.

Table 3. Wilcoxon signed-ranks test

Test Statistic ^b	
	Blood Sugar Levels Post- Blood Sugar Levels Pre-
Z	-3.162 ^b
Asymp. Sig. (2-tailed)	.002

Table 3 shows that the p-value= 0.002 is smaller than 0.05, which means it is significant, and the z score is -3.162^b. So, the hypothesis is accepted, meaning brisk walking has an effect on changes in random blood sugar levels before and after brisk walking exercise at Prolanis Kesamben Community Health Center, Jombang Regency.

4. DISCUSSIONS

Blood Sugar Levels in Prolanis Before and After Brisk Walking Exercise

Based on table 1, it shows that of the 20 respondents their blood sugar levels before brisk walking were carried out, the majority (75 %) were in the high category, 15 respondents. Jamshed et al (2019) stated that blood sugar levels usually fluctuate, going up and down throughout the day and at any time, depending on the metabolism of food into glucose by the body, as well as how the body manages glucose and increases after eating and again within 2 hours 8. Meanwhile, factors influencing blood glucose levels include type of food (diet), age, and lifestyle factors (physical activity). Apart from gender, sleep quality

can also be a factor that influences blood glucose levels (Hegazi, 2016).

This research shows that blood sugar levels fluctuate up and down throughout the day and can be influenced by many factors, according to the fact that the majority of respondents' blood sugar levels are in the high category. Therefore, respondents must always pay attention to what is happening. These factors can make blood sugar levels high so that blood sugar levels remain in the normal category.

Table 1 shows that of the 20 respondents, their blood sugar levels after brisk walking were mainly in the moderate category, namely 15 (75%) respondents. Controlling and lowering blood sugar levels by exercising or engaging in physical activity in DM sufferers can increase glucose metabolism, reduce blood fat, improve blood pressure, and reduce the possibility of degenerative diseases (Colberg, 2016).

This research shows that most respondents' blood sugar levels decreased for the better after doing routine physical activity for one week. This proves that exercise or physical activity can help or be

a solution for controlling blood sugar levels, especially in people with diabetes mellitus. Apart from routine physical activity, it can be a solution to control blood sugar levels (Brzan, 2016). However, there are still many other factors that respondents, especially DM sufferers, must pay attention to so that controlling their blood sugar levels can run and get good results. Because physical activity or exercise is not the only factor influencing blood sugar levels, further research is needed to expand what factors can influence blood sugar levels.

The Effect of Brisk Walking Exercise on Blood Sugar Levels in Diabetes Mellitus Sufferers at the Prolanis Kesamben Community Health Center, Jombang Regency

Based on the results of data analysis using the Wilcoxon Signed Ranks Test, the results obtained were p -value $(0.002) < \alpha$ (0.05) , which means that there was an effect of brisk walking exercise on blood sugar levels in Prolanis in the working area of the Kesamben Community Health Center, Jombang Regency.

Exercise or physical exercise will decrease blood glucose levels (SyLOW, 2016). Physical exercise can reduce insulin resistance, so insulin works better and

speeds up glucose transport into cells for energy needs. When doing physical activity or exercising, the muscle mechanism contracts and relaxes. Glucose will be used or burned for energy. Blood glucose will be transferred from the blood to the muscles during and after exercise for energy needs. Thus, blood glucose will fall. In addition, exercise makes insulin more sensitive. Insulin will work better to open the gate for glucose to enter the cells. Moreover, as a result, the need for insulin is also reduced (Ferrari, 2019).

According to research conducted by Sanjaya (2014), it was concluded that there was a decrease in blood sugar levels before and after diabetes exercise by 29 mg/dl. The results of other studies also concluded that running and aerobic exercise had a significant effect on reducing blood sugar levels in mild DM sufferers (Shakil-Ur-Rehman, 2017). From the results of this research, it can be concluded that exercise or physical activity is very effective in reducing or controlling blood sugar levels in type 2 DM sufferers; besides that, it can make sufferers healthier.

Many types of exercise, one of which is brisk walking, can be used as an alternative to control blood sugar levels effectively. Meanwhile, brisk walking is one of the non-pharmacological treatments recommended for DM sufferers because it

is considered more effective and efficient (Lopes, 2021). If done regularly, it can increase insulin action, stimulate glycogen synthesis, and stimulate glucose transport by glucose transporters. In addition, there is an increase in capillary proliferation in muscles, muscle mass, and muscle fibers, thus providing a beneficial effect on insulin sensitivity (Karimian, 2015).

This research shows that brisk walking effectively controls blood sugar levels. Respondents experienced changes in blood sugar levels after doing brisk walking exercises. If respondents regularly walk briskly, apart from being able to control blood sugar levels, they can also make their bodies healthier. Brisk walking can be done by respondents themselves every day. So, brisk walking affects changes in blood sugar levels. However, brisk walking training will be efficient if accompanied by paying attention to or controlling other factors.

5. CONCLUSIONS

Based on the research results, it can be concluded that the random blood sugar levels in Prolanis before brisk walking exercise were mostly in the High category, namely 15 respondents (75%), the random blood sugar levels in Prolanis DM after brisk walking exercise. Walking exercise was in the moderate category for 15

respondents (75%). Brisk walking exercise influences random changes in blood sugar levels in the Prolanis working area of the Kesamben Community Health Center, Jombang Regency. Brisk walking is recommended for diabetes management, and family, friends, or people closest to people with diabetes mellitus can help monitor and motivate them. Brisk walking can be a treatment option for diabetes mellitus because it has low side effects and is cheap and effective.

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AUTHOR CONTRIBUTIONS

Substantial contributions to conception, data collection, and analysis: M. Isfanur Rochman, Fahrudin Kurdi, and Anja Hesnia Kholis. Writing manuscript and revisions: M. Isfanur Rochman, and Fahrudin Kurdi.

CONFLICT OF INTEREST

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

DATA AVAILABILITY STATEMENT

The data are not publicly available due to privacy or ethical restrictions.

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