

DESCRIPTION OF PHYSICAL ACTIVITY AND THE INCIDENCE OF TYPE 2 DIABETES MELLITUS IN PRINGAPUS HAMLET, TEMANGGUNG DISTRICT

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Abstract

Type 2 diabetes mellitus is a disease characterized by hyperglycemia and metabolic disorders caused by a relative lack of carbohydrates, proteins, and fats. The research was conducted to know the description of physical activity and the incidence of type 2 diabetes mellitus in Pringapus Hamlet. The type of research used is descriptive quantitative with a male population of 30 respondents between the ages of 17-25 years consisting of 11 teenagers and 19 adults. The results showed that the majority of respondents had low activity as many as 23 (76.6%) respondents, while in type 2 diabetes mellitus the results of blood sugar examinations with 30 respondents were in the normal blood sugar category (GDS < 200 mg/dL), and based on the results calculation of body mass index found 1 respondent (3.3%) with obese nutritional status and 2 respondents (6.6%) with obese nutritional status. From the results of research conducted by researchers, it can be concluded that the majority of respondents have low activity levels, namely 23 (76.6%) respondents, while for the incidence of type 2 diabetes mellitus, based on the results of blood sugar examinations, all respondents (30 respondents) entered the blood sugar category. normal (GDS < 200 mg/dL).

Keywords: *Type 2 Diabetes Mellitus, Physical Activity*

Introduction

Globally, Diabetes Mellitus occurs in the community as many as 366 million individuals, which generally occurs at the age of 30 years and over and becomes a big problem that can lead to death (Nuraini & Supriatna, 2016). Symptoms of Diabetes Mellitus are characterized by increased blood sugar due to decreased insulin secretion by pancreatic beta cells or impaired insulin function (Fatimah, 2015). Symptoms that are often experienced by people with Diabetes Mellitus type 2 are polydipsia, polyuria, weight loss, and tingling (Fatimah, 2016). Meanwhile, Type 2 Diabetes Mellitus is a multifactorial disease in which the genetic and environmental components of the disease are equally strong. Genetic factors in type 2 Diabetes Mellitus are very high with diabetics coming from parents who have a previous history of Diabetes Mellitus, while environmental

factors include obesity, food, physical activity, and an unhealthy lifestyle (Amra, 2018).

Based on gender, the prevalence of type 2 Diabetes Mellitus in women is higher than in men (Imelda, 2018). Based on the 2018 Basic Health Research (RISKESDAS) data, the prevalence of diabetes mellitus in Indonesia in 2013 was 6.9% and increased to 8.5% in 2018. The prevalence of type 2 Diabetes Mellitus continues to increase, it is necessary to control risk factors by creating a healthy lifestyle to prevent type 2 Diabetes Mellitus (Paramitha, 2014). Type 2 diabetes mellitus is often referred to as lifestyle diabetes because the cause is hereditary, but physical activity and an unhealthy lifestyle can affect the occurrence of diabetes mellitus (Fourisita, 2020).

Physical activity is body movement caused by skeletal muscles or a form of behavior that produces an energy expenditure (Cicilia et al., 2019). Physical activity affects reducing risk, one of which is type 2 diabetes mellitus, organized physical activity and a healthy lifestyle are the most important things for good survival (Adhitya, 2016). Type 2 Diabetes Mellitus sufferers are mostly people who have activities with less intensity and only do it once a week. Physical activity that is less than twice a week has a 4-5 times risk of developing type 2 Diabetes Mellitus when compared to those who do physical activity and exercise regularly (Susilowati & Waskita, 2019).

Research that has been conducted in Pringapus Hamlet, Getas Village, Kaloran District, Temanggung Regency, found that 30 male and adult adolescents reached the moderate physical activity category of 9 people (30%) with a large hobby in playing volleyball. While people who have low physical activity 21 people (70%) are school children who take online learning and who like to play online games. According to the data obtained, physical activity can contribute to a non-communicable disease called Diabetes Mellitus type 2 (Nuraini & Supriatna, 2016).

Based on the background of the problem described above, it can be formulated the problem to be studied, namely the level of physical activity with the incidence of type 2 Diabetes Mellitus in Pringapus Hamlet, Getas Village, Temanggung Regency. The purpose of this research is to provide an overview of physical activity with the incidence of type 2 Diabetes Mellitus in adolescent boys and adults aged 17-26 in Pringapus Hamlet, Getas Village, Kaloran District, Temanggung Regency. The benefit of the research is to determine the level of physical activity and prevent the risk of Diabetes Mellitus Type 2 early on.

Method

The type of research used is descriptive quantitative. The purpose of the study was to find out the description of physical activity and the incidence of type

2 Diabetes Mellitus which was carried out in January 2021 in Pringapus Hamlet, Getas Village, Kaloran District, Temanggung Regency. Respondents involved in this study amounted to 30 respondents consisting of 11 adolescent respondents and 19 adult respondents, respondents were selected by purposive sampling with inclusion criteria, namely males aged 17-25 years, willing to become respondents, and residing in Pringapus Hamlet. Meanwhile, the exclusion criteria were not willing to be a respondent, not 17-25 years old, and not residing in Pringapus Hamlet.

There are 2 variables in the study, namely physical activity and the incidence of type 2 Diabetes Mellitus. The instrument used in this study was the Global Physical Activity Questionnaire (GPAQ), which is an instrument in the form of a questionnaire adopted from WHO and used to measure the level of physical activity with strong reliability (Kappa, 0.67 to 0.73), while the value of physical activity from the GPAQ instrument has a moderate level of validity correlated with data from the accelerometer or $r = 0.48$ (Adhitya, 2016).

While the measurement of BMI using a weight scale and height measuring device will then be classified according to the Indonesian Ministry of Health, the BMI classification is: Very Thin (BMI <17), Thin (BMI 17-18.4), Normal (BMI 18.5-25), Obese (BMI 25.0-27.0), Obesity (BMI >27). While the incidence of Diabetes Mellitus is done by measuring blood sugar levels when using a blood glucose meter. The data obtained were then analyzed using descriptive percentage analysis, with the percentage formula as follows:

$$p = \frac{f}{N} \times 100\%$$

Description:

P = Percentage Number

F = Frequency that the presentation is looking for

N = Number of Case (Number of frequency/number of individuals).

This research has also received an ethical suitability letter issued by the Ethics Commission of the Satya Wacana Christian University with the number: 090/KOMISIETIK/EC/6/2021.

Result and Discussion

The results of research conducted in Pringapus Hamlet, Getas Village, Kaloran District, Temanggung Regency on men with an age range of 17-25 years, a total of 30 respondents obtained the following data:

Table 1. Characteristics of Respondents

Category	F	%
Age		
17-19	11	36,6
20-22	11	36,6
23-25	8	26,6

Height (cm)		
150-160	8	26,6
161-170	20	66,6
171-180	2	6,6
Weight (kg)		
40-50	8	26,6
51-60	13	43,3
61-70	7	23,3
71-80	2	6,6

Based on the table above, it can be explained that most respondents are respondents aged 17-19 years and 20-22 years with a result of 11 (36.3%) respondents. For height, it can be explained from the table above that the most respondents with a height of 161-170 are 20 (66.6%) respondents. As for bodyweight, most respondents were 51-60 kg (43.3%). From the description of the table above, it can be concluded that the average 17-25 year old male in Pringapus Hamlet has a height of 160-170cm and an average weight of 51-60 kg.

Table 2. Frequency Distribution of Respondents Based on Body Mass Index (BMI)

Category	F	%
Very Thin (BMI<17)	0	0
Skinny (BMI 17-18,4)	6	20
Normal (BMI 18,5-25)	21	70
Fat (BMI 25,0-27,0)	1	3,3
Obesity (BMI>27)	2	6,6

Source: Kemenkes RI 2018

Based on the table above, it is explained that the frequency distribution of respondents is based on Body Mass Index (BMI) with the results of a total of 30 respondents on average being in the normal category, namely 21 (70%) respondents.

Table 3. Diabetes Incidence Based on Current Blood Sugar

Category	F	%
Normal (GDS<200mg/dL)	30	100
Diabetes Mellitus>200mg/dL	0	0

Source: Kemenkes RI 2018

Based on the table above, it can be seen that from 30 respondents, 30 (100%) respondents were in the Normal category and 0 (0%) were in the Diabetes Mellitus category based on current blood sugar measurements. It can be concluded that on average all respondents have normal blood sugar categories.

Table 4. Frequency Distribution of Physical Activity Levels

Physical Activity Level	F	%
High Activity	0	0
Moderate Activity	7	23,3
Low Activity	23	76,6

Source: WHO 2016

Based on the frequency distribution table for the level of physical activity, from 30 respondents aged 17-25 years in Pringapus Hamlet obtained using the GPAQ (Global Physical Activity Questionnaire) questionnaire, it can be concluded that the average level of physical activity of respondents in the low category is 23 (76.6 %) respondents.

Physical activity is a body movement caused by skeletal muscles or a form of behavior that results in energy expenditure (Cicilia et al., 2019). Physical activity affects reducing the risk of several diseases, one of which is type 2 diabetes mellitus, organized physical activity and a healthy lifestyle are the most important things for better survival (Adhitya, 2016). Sugar levels can be affected by physical activity, when doing physical activity with high intensity the use of glucose in the muscles increases, because to keep the sugar levels in the body in balance, endogenous glucose will be increased (Fourisita, 2020). This is the same as what was stated by (Betteng, 2014) that genetic factors in type 2 diabetes mellitus are very high in parents who have a previous history of diabetes mellitus, while factors originating from the environment are due to an unhealthy lifestyle, food, activity, physique, and obesity.

Based on the level of physical activity of the respondents, the researchers did not find respondents with high levels of physical activity, even the majority were respondents with low levels of activity, namely 23 (76.6%) respondents, with information from respondents who had low levels of physical activity, namely students who were taking lessons. online and on average they do not like sports and prefer online games, in contrast to respondents with high physical activity, they generally have a hobby of playing volleyball and even become volleyball athletes. So that research conducted by people who like to exercise does not have type 2 diabetes mellitus and only found 1 (3.3%) respondents with obese BMI criteria and 2 (6.6%) respondents with obesity BMI criteria. According to (Susilowati & Waskita, 2019) people with type 2 diabetes mellitus in the community are those who have low-intensity physical activity, those who do physical activity less than twice a week have 4-5 times the risk of developing type 2 diabetes mellitus when compared with those who do physical activity or exercise regularly.

Based on the results of research conducted by (Masi & Mulyadi, 2017) with the title the relationship between physical activity patterns and diet with blood sugar levels in type 2 diabetes mellitus patients at the Pancaran Kasih Hospital, Pancaran Kasih Hospital, Manado, explained that most of the respondents who had type 2 diabetes mellitus at the Pancaran Kasih Hospital

GMIM Manado with a light activity pattern/level, this statement is supported by research conducted by (Cicilia et al., 2019) with the title the relationship between physical activity and the incidence of diabetes mellitus in Outpatients at the Bitung City general hospital showed that there was a relationship between physical activity and the incidence of diabetes mellitus because there was a relationship between the two.

The results of the research described above contradict the research conducted by (Nuraini & Supriatna, 2016) entitled the relationship between diet, physical activity, and family history of diabetes mellitus type 2 which shows the results of a sample of 35 people who do poor physical activity without diabetes is 17 (89.5%), good physical activity with diabetes mellitus is 3 (20%), poor physical activity with diabetes mellitus is 2 (10.5%), and good physical activity without diabetes mellitus is 12 (80%). Then the data processing obtained a p-value of 0.634 with a p-value greater than the value of (0.05), so it can be concluded that there is no relationship between physical activity and type 2 diabetes mellitus.

Based on some of the research results described above, it can be concluded that the possibility of physical activity is not the main factor causing type 2 diabetes mellitus, of course, other factors cause type 2 diabetes mellitus such as unhealthy lifestyles such as lack of movement activity, diet unhealthy, often stay up late, and there are still many factors that influence type 2 diabetes mellitus (Fourisita, 2020). This statement is reinforced by research (Wibowo et al., 2020) which states that physical activity is a factor in the occurrence of prediabetes Mellitus but is not the only factor, other factors influence the occurrence of diabetes mellitus. However, physical activity is also a factor in maintaining a healthy body (Cicilia et al., 2019).

Conclusion

Based on the results of the research that has been done, it can be concluded that there are no respondents with a high level of physical activity, even the majority of respondents with a low activity level are 23 (76.6%) respondents. As for the incidence of type 2 diabetes mellitus in this study, no respondents with type 2 diabetes were found. Researchers obtained data for 1 (3.3%) of respondents with obese BMI criteria and 2 (6.6%) respondents with obesity BMI criteria. Based on the results of the research that has been described, it is possible that physical activity is not the main factor causing type 2 diabetes mellitus.

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