

## The Influence Of Compliance With Prolanis Participants On Blood Sugar Levels In Type 2 DM Patients In 3 Health Centers In Cirebon City

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### ARTICLE INFO

### ABSTRACT

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Type 2 DM was a chronic disease that caused major morbidity and mortality, like other chronic diseases. Various management efforts undertaken by patients with type 2 DM none other but aimed at controlling the blood glucose levels in patients. The government launched a program from the Health Social Security Organizing Agency (BPJS) named the Chronic Disease Management Program (PROLANIS). Purpose : This study aims to determine the effect of PROLANIS compliance participants on blood sugar levels in patients with type 2 DM. Method : This research was an observational study with a cross-sectional design using the Simple Random Sampling technique. The number of samples obtained is 50 samples. Primary data were obtained from a questionnaire filled out by PROLANIS participants with type 2 diabetes. Result : The results of the analysis used the spearman correlation test that there was no effect between education compliance to increase knowledge ( $p = 0.316$ ), PROLANIS exercises ( $p = 0.633$ ), and taking medication ( $p = 0.633$ ) on blood sugar levels of type 2 DM patients. The relationship ( $p = 0.038$ ) between adherence to carry out medical nutritional therapy to the levels of GDS of type 2 DM patients. Conclusions : There was no effect between education compliance to increase knowledge, PROLANIS exercises, and taking medication of PROLANIS participants on blood sugar levels of patients with type 2 diabetes. The effect between adherence to carry out medical nutritional therapy to the levels of GDS of type 2 DM patients.

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### 1. INTRODUCTION

Diabetes mellitus (DM) is a metabolic disease that has hyperglycemic characteristics due to reduced amounts of the hormone insulin, or the effectiveness of insulin even though the amount is normal<sup>1</sup>. Riskesdas 2018 shows that the prevalence of DM has increased compared to Riskesdas 2013.

Based on blood sugar checks, diabetes mellitus rose from 6.9% to 8.5%. The increase in the prevalence of this disease is related to lifestyle, including consumption of sweet foods and drinks, physical activity, and consumption of fruit and vegetables.<sup>3</sup> DM type 2 is a chronic disease that causes major morbidity and mortality, like other chronic diseases. Various management efforts carried out by type 2 DM sufferers are aimed at controlling glucose levels in the sufferer's blood.

The government has launched one of the programs of the Health Social Security Administering Agency (BPJS), namely the Chronic Disease Management Program (PROLANIS). PROLANIS is a health service system and a proactive approach that is implemented in an integrated manner involving participants, health facilities and BPJS health in the context of maintaining health for BPJS health participants who suffer from chronic diseases to achieve optimal quality of life with cost-effective and efficient health services<sup>8</sup>. PROLANIS itself has several activities consisting of medical consultations for PROLANIS participants, education at high risk clubs (PROLANIS clubs), Reminders, Home Visits.

The PROLANIS program has 4 pillars for controlling DM, including education to increase health knowledge, PROLANIS exercise, taking medication, and medical nutrition therapy, which aims to control blood glucose levels in type 2 DM sufferers. This program aims to encourage

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participants with DM Type 2 achieves optimal quality of life, has good results in specific examinations for Type 2 DM so that it can prevent disease complications.<sup>9</sup>

The success of a program is influenced by the compliance of members who take part in the program. Compliance is a person's ability to continue implementing the program that has been provided by the health service provider. Members are said to be obedient, with indicators that members implement 3 of the four pillars of PROLANIS. Based on the description above, the author is interested in researching: "The Effect of PROLANIS Participant Compliance on Blood Sugar Levels in Type 2 DM sufferers in 3 Cirebon City Health Centers".

## 2. METHOD

This research is an analytical observation, with data collection using a cross sectional approach with correlation analysis between the independent variables, namely the 4 pillars of PROLANIS and the dependent variable, namely the blood sugar levels of type 2 DM sufferers. The sample in this study was 50 people taken from the Kejaksan Community Health Center, Kalitanjung, and North National Housing Authority. How to take samples using simple random sampling technique. The instruments in this study used a questionnaire and a blood sugar measuring device.

The inclusion criteria in this study were:

- 1) Women or men aged  $\geq 40$  years.
- 2) PROLANIS participants suffer from type 2 DM.
- 3) Willing to be a respondent and sign informed consent.
- 4) PROLANIS participants who are in the area.

The exclusion criteria in this study are:

- 1) Not willing to be a respondent for this research.
- 2) PROLANIS participants are not sufferers of type 2 DM.
- 3) Type 2 DM sufferers with severe complications.

## 3. RESULTS AND DISCUSSION

Based on research conducted at the Kejaksan, Kalitanjung, and North Perumnas Community Health Centers, the following characteristics of respondents were obtained.:

**Table 1** Characteristics of Research Subjects

Variable	Frequency	Percentage
Education to increase Knowledge		
Good	45	90
Bad	5	10
Gymnastics Compliance		
Obedient	47	94
Not obey	3	6
Medication Compliance		
Obedient	47	94
Not obey	3	6
Compliance with medical nutrition therapy		
Good	42	84
Not good	8	16
When blood sugar		
Normoglycemia	39	78
Hyperglycemia	11	22
Total	50	100

Table 1 shows that the majority of the subjects in this study had education to increase good knowledge about diabetes, adhered to doing exercise, adhered to taking medication, adhered to medical nutrition therapy, and had normoglycemic GDS levels.

**Table 2** Descriptive Analysis of Research Subjects

Variable	Average	Standard Deviation	Median	Min-Max
Age	57.74	7.85	56.5	41-78
GDS	176.04	50.5	179.0	98-363

Table 2 showed that the subjects of this study had an average age of 57-58 years and GDS levels of 176.04 mg/dL.

### Bivariate Analysis

Data on education to increase knowledge, compliance with exercise, compliance with taking medication, compliance with medical nutrition therapy, and GDS were analyzed using the Spearman correlation method.

**Table 3** Results of Analysis of the Relationship Between Education To Increase Knowledge About Diabetes With GDS

		GDS		Total	p value	R
		Normal	Hyper			
Good	N	36	9	45	0.316	0.145
	%	72	18	90		
Bad	N	3	2	5	0.316	0.145
	%	6	4	10		
Total	N	39	11	50	0.316	0.145
	%	78	22	100		

Table 3 shows that people with education to increase good knowledge have a normal GDS of 36 and a high GDS of 9, and people with education to increase knowledge with poor knowledge have a normal GDS of 3 and a high GDS of 2. There is no relationship between knowledge about diabetes and GDS levels because the p value is  $>0.05$  ( $p = 0.316$ ). The correlation between variables is very weak ( $r=0.145$ ).

**Table 4** Results of Analysis of the Relationship Between Gymnastics Compliance and GDS

		GDS		Total	p value	R
		Normal	Hyper			
Obedient	N	37	10	47	0.633	0.069
	%	74	20	94		
Not obey	N	2	1	3	0.633	0.069
	%	4	2	6		
Total	N	39	11	50	0.633	0.069
	%	78	22	100		

Table 4 shows that people who adhere to exercise have a normal GDS of 37 people, and those who have a high GDS have 10 people, while people who do not comply with exercise have a normal GDS of 2 people and those who have a high GDS have 1 person. There is no relationship between exercise compliance and GDS levels because the p value is  $> 0.05$  ( $p = 0.633$ ). The correlation between variables is very weak ( $r=0.069$ ).

**Table 5** Results of Analysis of the Relationship Between Drinking Compliance Diabetes Medication With GDS

		GDS		Total	p value	R
		Normal	Hyper			
Obedient	N	37	10	47	0.633	0.069
	%	74	20	94		
Not obey	N	2	1	3	0.633	0.069
	%	4	2	6		
Total	N	39	11	50	0.633	0.069
	%	78	22	100		

Table 5 showed that people who were adherent to taking medication had a normal GDS of 37 people, and those who had a high GDS were 10 people, while people who were not adherent to taking medication had a normal GDS of 2 people, and those who had a high GDS were 1 person. There is no relationship between adherence to taking medication and GDS levels because the p value is  $> 0.05$  ( $p = 0.633$ ). The correlation between variables is very weak ( $r=0.069$ ).

**Table 6** Results of Analysis of the Relationship Between Compliance Medical Nutrition Therapy With GDS

		GDS		Total	p value	R
		Normal	Hyper			
Good	N	35	7	42	0.038	0.295
	%	70	14	84		
Not good	N	4	4	8		
	%	8	8	16		
Total	N	39	11	50		
	%	78	22	100		

Table 6 shows that people who carry out medical nutrition therapy well have a normal GDS of 35 people, and those who have a high GDS have 7 people, while people who do not carry out medical nutrition therapy well have a normal GDS of 4 people, and those who have a high GDS have 4 people. There is a relationship between compliance with medical nutrition therapy and GDS levels because the p value is  $< 0.05$  ( $p = 0.038$ ). The correlation between variables is weak ( $r=0.295$ ).

### Discussion

The results of this study indicate that the subjects of this study had an average age of 57 - 58 years. These results are in line with a survey conducted by the Indonesian Ministry of Health in Basic Health Research in 2018. In this survey, it was found that the highest prevalence of diabetes was found in the age group 55 - 64 years, namely 6.3%.<sup>3</sup> Age 45 - 64 years is the group The age with the highest incidence of diabetes in the world, it is estimated that around 809,000 new cases occur each year in this age group. 16 It has long been known that age  $\geq 40$  years is a risk factor for type 2 diabetes mellitus that cannot be modified.

This is because as we get older, the body's basal metabolism will decrease, so the use of glucose in the blood will also decrease. This condition is exacerbated by a decrease in the body's function to use glucose, resulting in chronic hyperglycemia which is the main pathogenesis of type 2 diabetes mellitus. 17 This research also found that there was no relationship between education to increase knowledge about type 2 diabetes and GDS levels ( $p = 0.218$ ). These results are in line with a study in Makassar in 2017.<sup>18</sup> Similar results were also shown by a study in Padang in 2018.<sup>19</sup>

The results of this study showed that the majority of research subjects adhered to PROLANIS exercise and the results of the analysis showed that there was no relationship between exercise compliance and GDS levels ( $p = 0.257$ ). These results are in line with a study in Bengkulu in 2018.<sup>24</sup> The study with a quasi-experimental design involving 60 elderly people found that there was no relationship between exercise and instantaneous blood sugar levels.<sup>24</sup>

The results of this study showed that the majority of patients in this study had a good level of medication adherence and there was no relationship between medication adherence and GDS levels ( $p = 0.208$ ). These results are not in line with various studies that have been published in Indonesia, one of which was research conducted in Kudus, Central Java, in 2018. Research with a cross-sectional design involving 73 people found that there was a relationship between adherence to taking medication and blood sugar levels. in diabetes patients.<sup>30</sup> The difference in the results of this study from previous studies may be due to differences in the tools used to measure the level of medication adherence.

This research also shows that the majority of diabetes patients in this study were compliant in carrying out medical nutrition therapy. The results of the analysis also found that there was a relationship between compliance with medical nutrition therapy and GDS levels ( $p = 0.038$ ). These results are in line with a study in Padang in 2018. The study with a cross-sectional design involving 80 people concluded that there was a relationship between diet and fasting blood sugar levels. 31

Another study that also showed the same results as this study was a study in Bengkulu in 2019. Research with a cross-sectional design involving 46 people found that there was a relationship between diet compliance and blood sugar levels in diabetes patients.<sup>34</sup>

Similar results were also shown by a study in Deli Serdang, North Sumatra, in 2020. The study with a cross-sectional design involving 44 people found that there was a relationship between diet compliance and blood sugar levels in diabetes patients. <sup>35</sup>. According to PERKENI 2015 Medical nutritional therapy is an important part of the comprehensive management of type 2 DM, so that it can maintain body weight, blood sugar levels, body fat, and the occurrence of complications of type 2 DM. For people with type 2 DM, it is necessary to emphasize the importance of regular eating in terms of eating schedule, type and amount of food, especially for those who use blood glucose-lowering drugs or insulin.<sup>14</sup>

The absence of a relationship between education to increase knowledge of type 2 DM, participating in exercise, and compliance with taking medication with the blood sugar levels of the research subjects may be caused by several things. First, the examination carried out is checking blood sugar levels at any time. This examination is less accurate in describing daily average glycemic conditions because it is greatly influenced by intake and activity several hours before this examination is carried out, so the examination results are inaccurate. It is possible that if a more accurate examination is carried out, such as fasting blood sugar or HbA1c, related results will be obtained. Second, this study assesses compliance based on a questionnaire which is very prone to recall bias. This makes the possibility of forgetting or deliberately covering up the true facts so as not to get a negative stigma very likely. It is possible that if other, more objective assessment techniques are used, they will show related results.

#### 4. CONCLUSION

There is no relationship between compliance with education to increase knowledge ( $p=0.316$ ), PROLANIS exercise ( $p=0.633$ ), and taking medication ( $p=0.633$ ) on blood sugar levels in type 2 DM sufferers, and one significant result was obtained, namely medical nutritional therapy with GDS levels. Where the results of univariate analysis show respondent compliance with medical nutrition therapy (84%). In bivariate analysis using the Spearman correlation test, the result was  $p = 0.038$ , which means that diet compliance has a relationship with GDS levels in type 2 DM sufferers. And the two variables have a relationship with a weak correlation strength ( $r = 0.295$ ).

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