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Comparison of Fast and Time Blood Glucose Levels in Chronic Disease Management Program Patients (Proalnic) and Non-Prolanic with Diabetes Mellitus in Praya Health Center

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Abstract: Glucose is the most important carbohydrate which is mostly absorbed into the bloodstream as glucose and other sugars are converted into glucose in the liver. Blood glucose levels are closely related to DM. Prolanic (Chronic Disease Management Program) is a health service system that involves participants from Health Facilities and BPJS health in the context of health care for participants suffering from chronic diseases including diabetes mellitus to achieve optimal quality of life with cost-effective and efficient health services. To determine the comparison of fasting and intermittent blood glucose levels in prolanic and non-prolanic patients suffering from DM at Praya Health Center. : This type of research is Analytical Observation, the sample is taken purposively. A sample of 30 respondents, in this study were 15 respondents who took prolanis and 15 respondents who did not follow prolanis who had a history of diabetes mellitus and underwent blood glucose level checks at the UPTD BLUD Laboratory of Praya Health Center. Based on research that has been done, the average fasting blood glucose level in prolanis is 158 mg/dl and fasting glucose is 204 mg/dl. Meanwhile, non-prolanic fasting glucose levels are 156 mg/dl and fasting glucose levels are 204 mg/dl

Keywords: Blood Glucose; Diabetic mellitus; Proalnic

Introduction

Diabetes Mellitus (DM) is a group of metabolic diseases with hyperglycemia characteristics that occur due to abnormalities in insulin secretion, insulin work, or both (Amir, S. M. et.al., 2015; Komariah, K., & Rahayu, S., 2020). DM is a chronic disease that is expected to continue to increase. The number of people with DM based on the results of Basic Health Research in 2018 has the highest number found in the DKI Jakarta area at 3.4% and the lowest in NTT at 0.9%, while in NTB at 1.6% (Milita, F., et.al., 2021). The prevalence of DM is highest in Mataram at 1.7%, and lowest in Central Lombok at 0.5%. Based on data from the Central Lombok Health Office, the prevalence of diabetes mellitus is 1.79% (in 2020) with the achievement of DM 848 and a target of 47,311. A clinical diagnosis of diabetes is usually characterized by classic symptoms (increased thirst, increased appetite, and frequent urination) and weight loss. For further diagnosis, a blood glucose examination can be done (Verdecchia, P. et.al., 2018). Blood glucose is a sugar found in the blood that is formed from carbohydrates in food and stored as glycogen in the liver and skeletal muscle (Umami, A. K., 2013; Sri Maharani, D. M. et.al., 2018). Current blood sugar (GDS) is a parameter for checking blood sugar levels that can be measured at any time regardless of the time the patient last ate. While fasting blood sugar (GDP) is a parameter of checking blood sugar levels measured after patients fast for at least 8 hours (Andreani, F. V. et.al., 2018; Fadilah, N. A. et.al., 2016; Kabosu, R. A. S. et.al., 2019).

Disruption of the blood glucose regulation system results in an increase in blood glucose more than normal. Blood glucose increases with age. Along with the aging

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process, more and more elderly are at risk of diabetes mellitus (Saraswati, D. et.al., 2018; Reswan, H. et.al., 2018). Prolanis (Chronic Disease Management Program) is an integrated proactive health service system that involves participants, Health Facilities and BPJS Kesehatan in the context of health maintenance for BPJS Health participants suffering from chronic diseases including diabetes mellitus to achieve an optimal quality of life with effective and efficient health service costs (Pangestika, H. et.al., 2022; Kurniawaty, E., & Yanita, B., 2016; Prasetyani, D., & Sodikin, S., 2017). Prolanis is a routine program carried out by Puskesmas Praya. This aims to reduce the number of diabetes mellitus suffered by the elderly in the work area of the Praya Health Center (Aida, A., & Santik, Y., 2020). One of the efforts made is to hold routine gymnastics once a week to lower blood glucose levels (Sari, I. P., & Effendi, M., 2020).

Method

This type of study is Observational *Analytics*, samples are taken purposively. The sample of 30 respondents in this study was 15 respondents who followed the prolanis and 15 respondents who did not follow the prolanis who had a history of diabetes mellitus and underwent blood glucose level checks at the UPTD BLUD Laboratory Puskesmas Praya.

Result and Discussion

Table 1. Results of Research on Fasting and Current Blood Glucose Levels in Chronic Disease Management Program (Prolanis) Patients

Sample Code (Gender/Age/BB)	Prolanist	
	GDP (mg/dl)	GDS (mg/dl)
S1 (L/61 TH/73kg)	205	287
S2 (P/70 TH/68kg)	201	261
S3 (L/69 TH/65kg)	112	196
S4 (P/59 TH/78kg)	271	318
S5 (L/67 TH/70kg)	121	167
S6 (L/63 TH/74kg)	119	182
S7 (P/69 TH/72kg)	247	291
S8 (P/58 TH/69kg)	195	229
S9 (P/55 TH/65kg)	152	189
S10 (P / 56 TH / 65kg)	124	160
S11 (P / 61 TH / 66kg)	138	165
S12 (P / 62 TH / 62kg)	169	133
S13 (L/54 TH/60kg)	97	191
S14 (P/56 TH/59kg)	93	131
S15 (P/60 TH/62kg)	132	158
Average	158	204

The results of a comparative study of fasting and current blood glucose levels in prolanists and non-prolanists suffering from Diabetes Mellitus can be seen in the table as follows.

Table 2. Results of Research on Fasting and Current Blood Glucose Levels in Non-Program Chronic Disease Management (Non Prolanis) Patients

Sample Code (Gender/Age/BB)	Non Prolanists	
	GDP (mg/dl)	GDS (mg/dl)
S1 (P/56 TH/72kg)	197	234
S2 (L/54 TH/71kg)	201	295
S3 (P/71 TH/69kg)	187	228
S4 (P/64 TH/64kg)	126	158
S5 (P/60 TH/68kg)	198	242
S6 (L/52 TH/73kg)	119	160
S7 (L/66 TH/74kg)	211	285
S8 (P/58 TH/69kg)	184	205
S9 (P/56 TH/62kg)	119	179
S10 (L/75 TH/76kg)	98	147
S11 (L/41 TH/74kg)	112	141
S12 (L/38 TH/70kg)	90	146
S13 (P/50 TH/71kg)	115	148
S14 (L/56 TH/80kg)	179	234
S15 (L/71 TH/82kg)	202	255
Average	156	204

Based on the table above, the average GDP test results in prolanis patients are 158 mg/dl and GDS test results are 204 mg/dl. While the results of GDP examination in non-prolanist patients were 156 mg/dl and GDS examination results 204 mg/dl. The first statistical test performed was the data normality test using *Shapiro-Wilk* (Wayan Kardika, I., 2013). If the test data is normally distributed, the value of $\alpha > 0.05$, then proceeds with the *Independent T Test.* If the data tested is not normally distributed, namely the value of $\alpha < 0.05$, then transformation is carried out first and if the data obtained is still not normally distributed, a non-parametric analysis test is used, namely the *Independent Samples Test* (Niawaty, P. et.al., 2021).

Table 3. *Shapiro-Wilk* Normality Test Results

		Shapiro-Wilk		
	Prolanist	Statistics	Df	Sig.
Fasting Blood Sugar [mg/dL]	Prolanist	.915	15	.160
	Non Prolanists	.846	15	.155
Current Blood Sugar [mg/dL]	Prolanist	.900	15	.097
	Non Prolanists	.899	15	.091

The results of statistical tests obtained a standard deviation value of $\alpha > 0.05$ showing that the sample value is not a normal deficiency. Thus, an *Independent Samples Test* was carried out and an insignificant value was obtained so that it was known that there was no difference between fasting and current blood glucose levels in prolanists and non-prolanists suffering from DM at UPTD BLUD Puskesmas Praya (Lestari, D. D., 2014).

Table 4. Statistical Test Results of *Independent Samples Test*

		t-test for Equality of Means		
		Df	Sig. (2-tailed)	Mean Difference
Fasting Blood Sugar [mg/dL]	Equal variances assumed	28	.890	2.53333
	Equal variances not assumed	26.963	.890	2.53333
Current Blood Sugar [mg/dL]	Equal variances assumed	28	.997	.06667
	Equal variances not assumed	27.658	.997	.06667

Based on research that has been done, the average fasting blood glucose level in prolanis is 158 mg/dl, and glucose when 204 mg/dl. While non-prolanis fasting glucose levels of 156 mg/dl, and glucose during 204 mg/dl then carried out *an Independent Samples Test* or other tests obtained p = 0.890 and p = 0.997 where the value was more than 0.05 (>0.05), so that the conclusion was that there was no significant difference in fasting blood glucose levels and during prolanists and non-prolanists suffering from DM (Dolscheid-Pommerich, R. C. et.al., 2016). In this study, the highest fasting glucose levels in elderly patients amounted to 271 mg/dl and the lowest of 93 mg/dl. While the highest blood glucose level was 291 mg/dl and the lowest was 131 mg/dl. The highest fasting blood glucose levels in non-prolanist patients were 211 mg/dl and the lowest was 90 mg / dl. While the highest blood glucose level was 295 mg / dl and the lowest was 141 mg / dl (Inayati, I., & Falah, K., 2014; Lathifah, N. L., 2017; Humair, M., 2019).

The occurrence of differences in results in blood glucose levels in prolanists and non-prolanists can occur because they are influenced by various factors both pre-analytical, analytical, and post-analytical (Tjekyan, R. S., 2014; Pasqualetti, S. et.al., 2017). In the pre-analytical stage, the factors that affect the sample are samples contaminated by other substances or tools that have not been calibrated so that they can be affected by the results, the analytical stage of influencing factors are inappropriate sample treatment, incubation time, and mixing of reagents, and post-analytical factors that often occur are interpretation of results and recording of results so that the results issued are not appropriate (Savitri, S., 2015; Kustiningsih, Y. et.al., 2016; Sarihati, I. G. A. D. et.al., 2019; Krisdianti, R. et.al., 2023).

In this study, results were obtained in the form of fasting blood glucose levels, and while in prolanists and non-prolanists were not much different. This can be caused by the low level of knowledge and awareness of respondents related to healthy lifestyles such as eating nutritious foods, regular exercise, and regular use of drugs for sufferers. It could also be caused by his lack of routine following prolanist gymnastics (Harmilan, H., &; Supodo, T., 2019; Sari, F. S., & Afnuhazi, R., 2020). Prolanist gymnastics should be done regularly 2 times a week to improve blood sugar levels and burn calories. During gymnastics patients, the muscles become more active resulting in increased membrane permeability and increased blood flow as a result of which more capillary membranes are open and more insulin receptors are active and there is a shift in energy use by muscles from fatty acid sources to the use of glucose and muscle glycogen (Rosita, B., & Zuhelmi, B., 2020; Rahmawati, R. et.al., 2022).

This shows that exercise or physical activity can increase the sensitivity of body cells to insulin to help lower sugar levels and blood fat levels, lower blood pressure and blood bad cholesterol (LDL) levels, and increase good cholesterol (HDL) thereby reducing the risk of heart disease, control weight, reduce the risk of complications of diabetes mellitus, strengthen the heart, muscles and bones, Reduce stress levels. Based on previous research conducted it was concluded that there was no effect of diabetes mellitus gymnastics on reducing blood glucose levels where a significant level value (a = 5%) was obtained with a p-value (p-value) of 0.0000, where the value (p < 0.005) (Masnah, C., & Kaimudin, K., 2021; Soewito, B., & Marlena, F. ,2021; Sari, P., Kesuma, S., & Hartono, A., 2013).

This is due to dietary factors and drug use from respondents not being controlled. The results of Rosita, B., & Zuhelmi, B., 2020 also stated that from the results of statistical tests, a p-value of 0.138 was obtained, which means the p-value > of alpha (p = 0.05), which means Ho is accepted so that it can be concluded that prolanis exercises do not have too much effect on reducing blood glucose levels.

Conclusion

The average fasting blood glucose level in elderly patients suffering from DM was 158 mg/dl and the average fasting blood glucose level in non-prolanist patients suffering from DM was 156 mg/dl. The average blood glucose level in elderly patients suffering from DM was 204 mg/dl and the average blood glucose level when in non-elderly patients suffering from DM was 204 mg/dl. There is no comparison of fasting and current glucose levels in prolanists and non-prolanists suffering from DM.

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The author declares no conflict of interes

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