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THE BLOOD GLUCOSE LEVEL OF PROLANIS PARTICIPANTS IN TEMANGGUNG HEALTH CENTER

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ABSTRACT
Diabtetes is a chronic disease that occurs due to inadequate control of blood glucose levels when the pancreas dose not produce enough insulin or when the body cannot use the insulin produce effectively, resulting in hyperglicemia. Program pengelolaan Penyakit kronis (Prolanis) is a Chronic Disease Management Program from BPJS Kesehatan that aims to improve the quality of life of patients in order to maintain health for BPJS Kesehatan Participants who suffer from chronic diseases to archieve optimal quality of life with effective and efficient health service Objective: This study aims to determine the description of blood glucose levels in Prolanis participants suffering from Diabetes Mellitus in the Temanggung Health Center. Method: This study uses a quantitative method with a descriptive analytical research design. Results: Most participants do not routinely attend prolanis activities. There is no difference in the average blood glucose levels of participants who routinely and do not routinely attend prolanis activities. Conclusions: The average blood glucose levels of prolanis participants who routinely participate in prolanis activities are not much different from participants who do not routinely participate in prolanis activities. However, when viewed from the minimum and maximum values, the blood glucose levels of prolanis participants who routinely participate in prolanis activities tend to be more stable.

Keywords: blood glucose level; diabetes mellitus; prolanis

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INTRODUCTION

Program Pengelolaan Penyakit Kronis (Prolanis) is a Chronic Disease Management Program from Badan Penyelenggara Jaminan Sosial Kesehatan (BPJS Kesehatan) that aims to improve the quality of life of chronic disease sufferers. Prolanis is an integrated activity that requires solid cooperation between BPJS Kesehatan, Health Facilities, and patients in order to maintain health for BPJS Kesehatan participants who suffer from chronic diseases to achieve optimal quality of life with effective and efficient health service costs (BPJS Kesehatan, 2014; Unit Pelayanan Kesehatan Kemenkes RI). The purpose of Prolanis is to encourage participants with chronic diseases to achieve optimal quality of life which indicator is 75% of registered participants who visit Primary Health Facilities having "good" results in specific examinations for Type 2 DM and Hypertension according to the related Clinical Guidelines so that they can prevent complications of the disease (BPJS Kesehatan, 2014).

From the explanation in the guide, it is clear that the target of this program is BPJS Kesehatan participants who suffer from Type 2 Diabetes Mellitus (DM) and Hypertension. Participants involved in this program are expected to have good examination results which can generally be interpreted as controlled blood sugar levels in DM participants and blood pressure in Hypertension partisipants. If the participant is a DM patient who has hypertension, the success measurement is in controlling both aspects. Controlled disease is expected not causin further complications that will reduce the quality of life of the chronic illness patients.

Diabetes is a chronic disease that occurs due to inadequate control of blood glucose levels when the pancreas does not produce enough insulin or when the body cannot use the insulin produced effectively. It is causing hyperglycemia (increased glucose/blood sugar) and over time causes serious damage to many body systems, especially the nerves and blood vessels (Sapra & Bhandari, 2025; World Health Organization, 2024a). In 2021, globally there were around 529 million people with diabetes with a global prevalence of around 6.1% and many of these people have type 2 diabetes and Diabetes was also among the top 10 causes of death, following a significant percentage increase of 95% since 2000 (Ong et al., 2023; World Health Organization, 2024b). This diabetes problem is very serious because the severe impact on various body systems, it is also known to occur in all countries in all genders and all age groups. In fact, diabetes is also one of the leading causes of death and disability.

Although the number of sufferers is large, type 2 DM has a great chance of being prevented. In some cases, patients who have type 2 DM can recover if identified and treated early (Ong et al., 2023). This finding is relevant to the Polanis program initiated and implemented by BPJS Kesehatan in collaboration with health services and BPJS participants. The opportunity for type 2 DM patients to recover or at least be able to control blood glucose levels so that there are no more severe impacts makes Prolanis for type 2 DM patients interesting to be discussed.This study aims to determine the description of blood glucose levels in diabetes mellitus patients participating in Prolanis in the Temanggung Health Center work area. To get an overview of the blood glucose levels of Prolanis participants, a study was conducted on Prolanis participants which was carried out at the Temanggung Health Center. With the location of the health center in the middle of the city, the opportunity for BPJS participants to participate in Prolanis activities will be greater. This is supported by the results of research which shows that accessibility to health facilities is one of the influencing factors besides the main factor of social support (Syafa'at, Pulungan, & Permatasari, 2019)). Other data show that accessibility, family support, and the role of health workers are closely related to the level of visits by Prolanis participants (Parinussa, Tubalawony, & Matulessy, 2022) .

METHOD

This study is a quantitative research method with a descriptive analytical research design. The population in this study were Prolanis participants with DM in the Temanggung Health Center work area. The subjects of this study were Prolanis participants with DM who participated in Prolanis activities from January to March 2024.Data were taken from the results of blood glucose level measurements in Prolanis participants with DM carried out in January, February, March 2024. The data was obtained from Temanggung Health Center's Prolanis records. Blood glucose level measurements were carried out by a laboratory appointed by the Temanggung Health Center. Descriptive data analysis was used to analyze data on the frequency of attendance of Prolanis participants and blood glucose levels of Prolanis participants. The three months blood glucose measurements data were analyzed using an independent t-test to analyze the differences in blood glucose levels of Prolanis participants who routinely and non-routinely participated in Prolanis activities.

RESULT

Table 1.
Frequency of Attendance of Prolanis Participants

Attendance	f	%
Routine	28	27.18
Not routine	75	72.82

Based on table 1, it can be seen that within 3 months of observation, 72.82% of prolanis participants did not attend prolanis activities regularly and 27.18% of prolanis participants

regularly attended prolanis activities. This shows that some of the participants do not routinely attend prolanis activities.

Table 2.
Blood Glucose Levels of Prolanis Participants

Attendance	Mean	Min	Max
Routine	143.99 mg/dl	94.00 mg/dl	304.00 mg/dl
Not routine	144.51 mg/dl	70.00 mg/dl	419.00 mg/dl

Table 2 shows that the average blood glucose level of prolanis participants who routinely participate in prolanis activities is 143.99 mg/dl with the lowest glucose level of 94 mg/dl and the highest glucose level of 304 mg/dl. Meanwhile, the average blood glucose level of prolanis participants who do not routinely participate in prolanis activities is 144.51 mg/dl with the lowest sugar level of 70 mg/dl and the highest sugar level of 419 mg/dl.

Table 3.
Blood Glucose Levels of Prolanis Participants

Kehadiran	Mean	df	Computed t	Tabular t (α 0,05)	p-value	deskripsi	Kesimpulan
Rutin	143.99	101.00	-0.036	0.971	0.971	Tidak signifikan	Ho diterima
Tidak Rutin	144.51	70.06	-0.043	0.966	0.966		

Table 3 shows a t value of 0.97 > α (0.05) which indicates that there is no difference in the average blood glucose levels of participants who routinely and do not routinely participate in prolanis activities.

DISCUSSION

Frequency of Attendance

Prolanis is a program to help people with chronic diseases, especially patients with Diabetes Mellitus and Hypertension. The goal is to control their disease so that their quality of life improves and prevent complications at minimal cost. However, the results of the study showed that 72.82% of respondents did not routinely participate in Prolanis activities. Fadila & Ahmad (2021) explained that low participation in Prolanis activities was influenced by the level of knowledge and patient perception of the seriousness of the disease. Education is needed to help increase the knowledge of Prolanis participants and change their perception of the importance of Prolanis activities so that they can increase participation in Prolanis. Education will help increase the knowledge of Prolanis participants so that they can provide motivation and increase awareness of the importance of Prolanis activities (Purnamasari, 2017).

Chronic Disease Management Program (CDMP) helped reduce the overall and microvascular risks of complications compared to the non-CDMP group; however, the protective effect against macrovascular complications was only observed in those aged ≥ 40 years. Subgroup analysis of the group aged ≥ 40 years with high adherence (an MPR ≥ 80) showed that the CDMP effectively reduced the incidence of micro- and macrovascular complications (Hyun, Lee, & Ko, 2023). The CDMP is similar with Prolanis and the research showed a result that it gives a big advantage for participants. Minimum complications of the participants will bring efficiency in cost spending to intervene the complications. In the end, it is not only for the participants but also for the government profit. Participants with higher attendance in Prolanis activities were associated with better health parameter of each chronic illness. A research of participants who had 5 years participation in Prolanis showed that that there were significant differences occurred in the values of HbA1c, ureum, creatinine, and eGFR parameters in the group of patients with attendance ≥40 months. However, it has not been proven to be beneficial in maintaining the stability of HbA1c in the attendance group ≥ 40 compared to the attendance group < 40 months (Fadillah, Afriandi, & Arya, 2024).

Multi-morbid older adults who are in better physical health and who are dissatisfied with their physicians' support for patient activation are more likely to participate in Chronic Disease Self-Management (CDSM) courses (Dattalo et al., 2012). Another research in this program gave fact that Attendance rates that varied from 10.4–98.5% (mean =72.5%). There is considerable overlap between enrollment and attendance factors. These included Competing Commitments, Logistics, Personal characteristics, Perception of illness/health status, Health service provision, and Group dynamics. Varied and individualized factors can facilitate or impede enrollment or attendance in group CDSM programs. Consideration of these factors and tailoring of programs is needed to facilitate patient ability to take part (Kessler et al., 2023). This program was not the same with Prolanis, but it seems that the purpose of the program was similar and could be a comparation to the Prolanis program.

Research by Parinussa, Tubalawony, & Matulessy, (2022) revealed that accessibility, family support and the role of health workers influenced the participation of Prolanis participants in the activities held. Accessibility is not only influenced by the location of the activity but also by the ability of Prolanis participants to access health service facilities. Family support is also very important to help increase the participation of Prolanis participants in activities. It is important for officers to provide education not only to Prolanis participants but also to their families so that they can facilitate and support Prolanis participants to actively participate. In addition, the role of officers contributes significantly to the active participation of Prolanis participants in Prolanis activities. A friendly attitude, always smiling, always providing explanations regarding participants' health problems both after a health check and when participants ask about their illnesses has been shown to increase the participation of Prolanis participants in Prolanis activities.

The results of this study indicate that Prolanis participants who routinely participate in activities are only 27.8%. Thus, more Prolanis participants do not routinely attend Prolanis activities. These results are similar to a study which shows that participants who do not actively participate in Prolanis reach 70.6% with the most influencing factors being the level of knowledge ($p = 0.000$), and the perception of the seriousness of the disease ($p = 0.000$) (Fadila & Ahmad, 2021). The low attendance frequency show that most of the participants were not pasticipate actively. In fact, it is not only the attendance which is low, even the number of patients' participation in Prolanis was not as high as expected. Nationally, only 12% of Jaminan Kesehatan nasional (JKN) members who were diagnosed by a primary care provider with any one of the nine conditions covered by both Prolanis and Program Rujuk Balik (PRB) were registered for Prolanis in 2020 and 14% in 2021 (Nappoe, Djasri, & Kurniawan, 2023).

It was shown in former study that respondents who had higher knowledge, higher education, elderly age, supported by family were more routinely attended Prolanis than who had lower knowledge, lower education, adult age and low family supprot. It was concluded that factors associated with the presence of chronic disease patients to Prolanis were knowledge, age, education, work, family support and the role of health workers (Parta, 2024). The results of the study indicate that to increase the participation of Prolanis participants in Prolanis activities, education is needed for Prolanis participants, cooperation with families as a support system and improving the quality of service by showing a polite and friendly attitude in serving people with chronic diseases. Based on this, an approach is needed for Prolanis participants at the Temanggung Health Center to find out the causes of Prolanis participants' absence from activities so that it can be an evaluation for program implementers. This will determine the interventions that can be carried out by program implementers to encourage active participation in Prolanis activities.

Blood Glucose Levels of Prolanis Participants

In Table 2, it can be seen that the blood glucose values of Prolanis participants who routinely follow the minimum blood glucose value of 94 mg/dl and the maximum reaches 304 mg/dl with an average value of 143.99 mg/dl. The blood glucose levels of Prolanis participants who do not routinely follow the minimum blood glucose value of 70 mg/dl and the maximum reaches 419 mg/dl with an average value of 144.51 mg/dl. From the data, it can be concluded that the average values of each participant who routinely and do not routinely do not have a significant difference in value. However, there are minimum and maximum values in Prolanis participants that are quite significantly different. The maximum blood glucose value reaches a fairly high number, namely 419 mg/dl. This is quite dangerous if it continues because it can cause complications of diabetes mellitus such as kidney damage, cardiovascular disease, eye disorders, amputations of the extremities and nerve damage.In the study with research title The Relationship between Compliance with Prolanis Visits and Fasting Blood Glucose Levels, it was explained that most Prolanis participants were compliant, namely 69.8%, while 30.2% were non-compliant. Prolanis participants who had good fasting blood glucose levels were 67.4% and 32.6% had poor fasting blood glucose levels. The results of the bivariate analysis showed a result of $p = 0.008$ ($p < 0.05$) which means there is a significant relationship between the two variables. The PR value = 3.077 indicates that less compliant Prolanis visits have a risk of experiencing poor fasting blood glucose levels 3.077 times compared to those who are compliant (Nastiti, 2023).

A literature review of ten research articles was concluded that based on a review of the entire article, it was concluded that there were significant differences in blood sugar levels in patients who took prolanis and non-prolanis. Non-prolanis patients have a risk of uncontrolled blood sugar. The level of patient compliance in taking medication is a factor supporting recovery in diabetes mellitus. In addition, prolanis activities in the form of gymnastics are proven to help control blood sugar in patients. Family is also one of the important factors needed to support the success of the Prolanis program (Silvi, Safrizal, Siregar, & Anwar, 2023). Another study showed that out of 55 respondents who were obedient in following Prolanis, 27 respondents (49.1%) had controlled blood sugar levels, 28 respondents (50.9%) had uncontrolled blood sugar levels. Based on the Chi Square test, a p-value of $0.03 \leq \alpha$ (0.05) was obtained. The study showed that there was a relationship between compliance in Prolanis activities and blood sugar levels in type 2 Diabetes Mellitus patients at the Lamper Tengah Health Center (Aristya, 2018). From the results of the study, it can be concluded that participants who routinely follow Prolanis have lower maximum blood glucose levels than prolanis participants who are not routine, so it is hoped that Prolanis participants will routinely follow Prolanis activities as an effort to control blood glucose levels. Those facts above show similar conclusions about compliance to Prolanis activity which is shown by the attendance to the Prolanis program.

Based on the results of the calculation of the minimum and maximum values in Table 2, the variability/fluctuation of blood glucose in prolanis participants who routinely participate in activities is 210 mg/dl while the variability/fluctuation of glucose levels in prolanis participants who do not routinely participate is 349 mg/dl. This fact shows that the range of blood glucose levels in prolanis participants is narrower compared to those who do not routinely participate in prolanis. The range of ups and downs of blood glucose levels is called variability/fluctuation of blood glucose levels. This wide range is something that needs attention. The greater the fluctuation of blood glucose levels, the worse the prognosis related to complications and critical care, so it must always be maintained within a narrow range (Ceriello & Kilpatrick, 2013). Other studies also emphasize that glucose variability contributes to an increase in average blood glucose and the development of diabetes complications, so it is worthy of being a target parameter for optimal glycemic control above

standard parameters such as blood glucose levels and HbA1c (Suh & Kim, 2015). The results of this study show the important role of glucose variability/fluctuation in the management of diabetes mellitus to reduce the risk of complications that may arise, and it is seen that patients have better glucose variability/fluctuation by routinely participating in prolanis activities.

Differences in Average Blood Glucose Levels of Prolanis Participants

It is assumed that DM patients who routinely participate in Prolanis activities will have better glucose control, but the data shows that there is no significant difference in blood glucose levels of participants who attend activities regularly or not regularly. The results of this study may seem surprising considering the high hopes that Prolanis will help control blood glucose levels. As a comparison, the study Comparison of Fast and Time Blood Glucose Levels in Chronic Disease Management Program Patients (Prolanic) and NonProlanic with Diabetes Mellitus in Praya Health Center showed that the average fasting blood glucose level of Prolanis participants was 158 mg/dl and non-Prolanis participants 156 mg/dl while the average random blood glucose level of Prolanis participants was 204 mg/dl and non-Prolanis participants 204 mg/dl (Aini, Tatontos, Inayati, & Pauzi, 2024). The study showed more or less balanced results where participants who routinely attended Prolanis and not routinely or were not Prolanis participants did not have significant differences in blood glucose control.

Prolanis activities are held as part of efforts to maintain health in patients with chronic diseases, in this study were patients with diabetes mellitus. The assessment standard for maintaining the condition of patients with diabetes mellitus is determined by blood glucose levels. Prolanis participants are expected to have blood glucose levels that are on average more controlled compared to those who do not participate in the program. Based on the results of a study, there is an effect of Prolanis gymnastics on blood sugar with a significance of 0.001. It can be concluded that there is an effect of Prolanis Gymnastics on controlling blood sugar levels and blood pressure in patients with Diabetes Mellitus (Hasfika, Erawati, & Sitorus, 2020). The results of the pre and post tests on prolanis gymnastics participants in Kebakkramat showed a decrease in average blood glucose levels from 167 mg/dl to 145 mg/dl (Handayani, Heruwati, & Wijayanti, 2023)

According to scope review results, Prolanis effectively maintains and reduces several essential aspects of DM patients' health, such as body mass index, fasting blood glucose, and HbA1c levels. Prolanis also plays a positive role in improving the lipid profiles of DM patients. Furthermore, Prolanis contributes to increasing self-efficacy, self-acceptance, self-management, adherence to therapy, and overall quality of life (Fadlilah, Nugroho, & Bistara, 2024). The conclusion of this scope review gave us a point of view about the role of Prolanis in supporting participants to increase their own health status. This health behaviour will make a long lasting change in participants health status including blood glucose. The results of this study can be understood by the fact that the measurements in this study did not explain the diet patterns, drug consumption and activities carried out by Prolanis participants. Thus, there is a possibility that in reality, Prolanis participants who do not routinely attend have similar or better patterns than those who routinely attend so that the results of their blood glucose control are also similar. Although participants routinely participate in Prolanis activities, if they do not apply the expected diet activity and drug consumption patterns, the results achieved will not be optimal, and may even be worse than those who are not Prolanis participants but are compliant with the management of diabetes mellitus. More than numeric parameter as an output standard for Prolanis participants, we need to have another perspective that Prolanis with all activities within is a form of Chronic Disease Management Program which was proven effectively improving participants' self-management skills and quality of life including additional benefits such as increased motivation for behavioral change,

enhanced confidence regarding self-care of chronic conditions, improved communication with healthcare providers, and better coping strategies (Bahari & Kerari, 2024).

CONCLUSION

The average blood glucose levels of routinely participate in prolanis activities are not much different from participants who do not routinely participate in prolanis activities. However, the range of blood glucose levels in prolanis routin participants is narrower compared to those who do not routinely participate in prolanis. This shows the positive influences of prolanis activities in helping to maintain blood glucose levels in Diabetes Mellitus patients. A healthy lifestyle such as maintaining a diet, taking medication, and physical activity will help chronic disease sufferers to prevent complications that may arise and improve their quality of life. Program implementers can approach Prolanis participants to find out the causes of Prolanis participants' absence from activities so that it can be an evaluation for the program, prolanis participants can actively participate in prolanis activities, and comply with maintaining a healthy lifestyle to maintain their quality of life.

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