The Relationship of Compliance to Follow Prolanis with the Stability of Blood Sugar Levels of Patients with Type 2 Diabetes Mellitus at the Lumpue Health Center in Pare-Pare City

Sri Syatriani1*, Yenni Purnamawati2
1STIK Makassar, Jin. Maccini Raya No. 197 90223 Kota Makassar, Indonesia
2Program Studi Ilmu Keperawatan, Jin. Maccini Raya no.197 90222 Kota Makassar, Indonesia

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ABSTRACT

Diabetes Mellitus is a disease that can cause complications to prevent complications can be done by maintaining the stability of blood sugar in people with diabetes. One of the efforts of patients of Diabetes mellitus (DM) in maintaining the stability of blood sugar levels is to adhere to one of the Corneal Disease Management Programs (PROLANIS). The prevalence of diabetes mellitus in Indonesia in 2018 will reach 10.9%. The purpose of this study was to determine the relationship of compliance to follow prolanis with the stability of blood sugar levels of patientss with type 2 diabetes mellitus. This type of research is analytic research with cross sectional study design. The sample in this study were all patients of diabetes mellitus who participated in the prolanis activities of 40 respondents at the Lumpue Health Center in Parepare City in September 2018 - January 2019 which were selected by total sampling technique. Data were analyzed by Chi-Square test. The results showed that most of the respondents included in the category of obediently followed prolanis, as many as 31 (77.5%) people and the majority with stable blood sugar, as many as 31 (77.5%) people. Relationship test results obtained p value (0,000) <α (0.05), which means there is an relationship compliance to follow Prolanis with the stability of blood sugar in patientss with diabetes mellitus in the Lumpue Health Center in Parepare City. The conclusion of this research is that there is an relationship compliance to follow Prolanis with the stability of blood sugar. Patientss with diabetes mellitus are expected to routinely participate in prolanis activities held at each puskesmas to stabilize blood sugar levels.

INTRODUCTION*

Diabetes Mellitus is a group of metabolic diseases with characteristic hyperglycemia that occurs due to abnormal insulin secretion, insulin action or both [1]. An increase in blood glucose or hyperglycemia can cause chronic microvascular complications (kidney and eye disease) and neuropathic complications (neurological disease).

According to the World Health Organization (WHO) in 2017, the percentage of diabetics around the world in 2017 was 8.8% and the projection for 2045 was 9.9% [2]. Data from the International Diabetes Federation (IDF) in 2017, the prevalence of diabetes mellitus in 2017 was 279 million people and estimated in 2045 as many as 473 million people [3]. Patients with diabetes mellitus in 2017 in Africa aged 20-79 years were 15.5 million (3.3%), who were undiagnosed (62.9%). India occupies the second position of 73 million people with half of the people estimated to be undiagnosed [3].

According to Riskesdas data in 2018 the prevalence of diabetes in Indonesia reaches 10.9%, predicted in 2030 to reach 21.3 million people. Sample registration survey data in 2018 shows that diabetes is the third leading cause

* Corresponding author.
E-mail address: ssyatriani@gmail.com

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of death in Indonesia with a percentage (6.7%) after stroke (21.1%) and coronary heart disease (12.9%) [4].

The prevalence of diabetes mellitus in South Sulawesi according to the results of basic health research in 2013 the prevalence of diabetes mellitus in South Sulawesi for umur 15 years of age was 3.4% and ranks third of all provinces in Indonesia [5]. The prevalence of diabetes mellitus in 2018 decreases to 1.8% [4].

The number of cases of diabetes mellitus in the City of Pare-Pare is the highest compared to other diseases and even an increase from 2016 as many as 1,517 suffering and in 2017 as many as 4,260 patientss [6].

The number of people with Diabetes Mellitus at the Lumpue Health Center is still high. In 2016 there were 107 new cases, in 2017 there were 51 new cases and in 2018 there were 70 new cases. From these data, the number of patientss of Diabetes mellitus is increasing, compared to cases of other diseases [7].

The increasing number of people with diabetes mellitus that consistently shows that diabetes mellitus is a health problem that needs special attention in health services in the community. In Indonesia there is already a program aimed at managing chronic diseases called prolanis. In this program there will be a family doctor who serves as a gate keeper who not only selects patientss to be referred to related specialists, but can also provide comprehensive and focused services in promoting and preventive efforts [8].

The results of Primahuda and Sujianto research in 2016 at the Babat Health Center in Lamongan District showed that blood sugar stability plays an important role in diabetes management. Based on the 4 pillars of PROLANIS (Chronic Disease Management Program) the majority of people with diabetes are not compliant with education (61%), physical activity (56%), and treatment (52.3%), while the majority of people with diabetes are adherent to diet (90.2%) [9].

Research by Pradyta, et al. (2017) shows the results of patientss who have good health status 42 people (78.0%). Participation of participants in prolanis gymnastics activities were good 128 patientss (67.0%). While participation in health education activities with 128 patientss well (67.0%). Chi Square test results were significant 0.018 (p <0.05), which means there is a relationship between prolanis activity and the health status of patientss of diabetes mellitus [10].

According to Kurniasih, et al. (2018) There is a strong correlation of 0.913 or 91.3% the effect of Prolanis in controlling blood sugar control in the Sudiang Community Health Center. Compliance with physical activity with a value of $\beta = 0.753$ and checking blood sugar of $\beta = 0.371$ significantly supports Prolanis in controlling blood sugar control in the Sudiang Public Health Center [11]. Subagyo, et al. (2016) obtained an average blood sugar level before prolanis exercises 164.50 mg/dl and after prolanis exercises (4 times/week for 1 month) 145.13 mg/dl [12].

Diabetes mellitus is a chronic disease, so it is necessary to prevent further complications [13]. One prevention of complications is to maintain blood sugar stability in people with diabetes. Therefore, the government through BPJS provides services to help maintain blood sugar stability by forming PROLANIS for diabetes mellitus. The PROLANIS program implemented for people with type 2 diabetes mellitus has 5 pillars for managing blood sugar control, including education, nutritional diets (meal planning), physical activity, medicines, blood sugar level monitoring [14].

**METHOD**

The research design used in this study is analytic research with cross sectional design. The population in this study were all people with diabetes mellitus who took part in prolanis activities at the Lumpue Health Center in Parepare City in September 2018 - January 2019 with a total of 40 respondents using total sampling techniques. Sources of research data using primary data. The instruments used in data collection were observation sheets and questionnaires. Data were analyzed by chi-square test. This research was conducted at the Lumpue Health Center in Parepare City, starting on February 2 - March 2, 2019.

**RESULTS AND DISCUSSION**

**Characteristics of Respondents**
Table 1. Characteristics of Type 2 Diabetes Mellitus Patients in the Pare-Pare City Lumpue Health Center in 2019

<table>
<thead>
<tr>
<th>Characteristics of Respondents</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age group (Year):</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31-37</td>
<td>1</td>
<td>2.5</td>
</tr>
<tr>
<td>38-44</td>
<td>7</td>
<td>17.5</td>
</tr>
<tr>
<td>45-51</td>
<td>10</td>
<td>25.0</td>
</tr>
<tr>
<td>52-58</td>
<td>10</td>
<td>25.0</td>
</tr>
<tr>
<td>59-65</td>
<td>11</td>
<td>27.5</td>
</tr>
<tr>
<td>66-72</td>
<td>1</td>
<td>2.5</td>
</tr>
<tr>
<td><strong>Gender:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>9</td>
<td>22.5</td>
</tr>
<tr>
<td>Female</td>
<td>31</td>
<td>77.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>40</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Primary Data

Table 1 shows that of the 40 people (100%) of respondents, the age of most respondents was in the age group 59-65 years as many as 11 people (27.5%) and the lowest was in the age group 31-37 years and 66-72 years each as many as 1 person (2.5%), and gender, namely females more than males is 31 people (77.5%).

Univariate Analysis

Table 2. Characteristics of Research Variables at the Lumpue Health Center in Pare-Pare City 2019

<table>
<thead>
<tr>
<th>Characteristics of Research Variables</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Compliance:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compliance</td>
<td>31</td>
<td>77.5</td>
</tr>
<tr>
<td>Uncompliance</td>
<td>9</td>
<td>22.5</td>
</tr>
<tr>
<td><strong>Stability of Blood Sugar Levels:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stable</td>
<td>31</td>
<td>77.5</td>
</tr>
<tr>
<td>Unstable</td>
<td>9</td>
<td>22.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>40</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Primary Data

Table 2 shows that more respondents complied with prolanis than 31 non-adherents (77.5%). Respondents’ blood sugar levels were more stable than 31 unstable ones (77.5%).

Bivariate Analysis

Table 3. Relationship of Compliance to follow Prolanis with Stability of Blood Sugar Levels of Patients with Type 2 Diabetes Mellitus in Lumpue Health Center Parepare City in 2019

<table>
<thead>
<tr>
<th>Compliance to follow Prolanis</th>
<th>Stability of Blood Sugar Levels</th>
<th>Total</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stable</td>
<td>Stable</td>
<td>31</td>
<td>77.5</td>
</tr>
<tr>
<td>Stable</td>
<td>Unstable</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Unstable</td>
<td>Stable</td>
<td>9</td>
<td>22.5</td>
</tr>
<tr>
<td>Unstable</td>
<td>Unstable</td>
<td>9</td>
<td>22.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>40</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Primary Data

Table 3 shows that there were 31 people (77.5%) who adhered to the prolanis program and their blood sugar levels were stable and there were 9 people (22.5%) who did not comply with the prolanis program and their blood sugar levels were unstable.

Based on the Chi-Square test results obtained p values (0,000) < α (0.05), thus the hypothesis of this study was accepted. This shows that there is a relationship of adherence to follow prolanis to the stability of blood sugar levels in patients with type 2 diabetes mellitus in the Lumpue Health Center, Parepare City.

Discussion

Characteristics of Respondents

The results showed that respondents who suffer from diabetes mellitus who participated in the prolanis program were more female than male. That is because women spend more time at home so that their physical activity is reduced and the potential to consume more food so that the risk of experiencing obesity is higher. Obesity is one of the causes triggering the occurrence of diabetes mellitus.

Respondents in terms of age are more dominant at the age above 50 years. It is known that normal blood sugar levels tend to increase lightly but progressively (gradually) after the age of 50 years, especially in people who are not actively moving. Increased blood sugar levels after eating or drinking stimulates the pancreas to produce insulin thereby preventing further increases in blood sugar levels and causing blood sugar levels to decrease slowly [15].
Relationship of Compliance to follow Prolanis with Blood Sugar Level Stability in Patients with Type 2 Diabetes Mellitus

Diabetes mellitus is classified as a chronic disease, although it cannot be cured, it can be controlled by recognizing the symptoms of the disease early to help manage it faster and easier, and to prevent patients from complications arising, it is necessary to prevent further complications [13].

In order to maintain health for health BPJS participants who suffer from chronic diseases, especially diabetes mellitus, health BPJS has a Prolanis program (Chronic Disease Management Program) where people with diabetes mellitus do gymnastics, and education for every week or usually also done twice a month which aims to control blood sugar so that blood sugar levels decrease and remain stable.

The results showed there was a relationship between adherence to follow Prolanis with the stability of blood sugar levels in patients with diabetes mellitus in the Lumpue Health Center in Parepare City (p value = 0,000 <α = 0.05).

Prolanis activities are very beneficial for health, especially diabetes mellitus. In addition, Prolanis activities can help BPJS health in minimizing the incidence of non-communicable diseases (PTM), where funding for patients with chronic diseases is very high, it is necessary to take preventive measures related to chronic diseases.

To achieve the goal of Prolanis in stabilizing blood sugar levels and lowering blood sugar levels, a number of activities such as gymnastics and education are carried out aimed at increasing health knowledge in efforts to restore disease and prevent disease re-emergence and improve health status for Prolanis participants, then examining fasting blood sugar levels.

Based on research that has been done, more respondents obediently follow Prolanis and have stable blood sugar levels. While respondents who do not obediently follow Prolanis, have unstable blood sugar levels. Non-compliance of Prolanis participants in participating in Prolanis is because respondents are lazy to participate in activities such as gymnastics or education.

If the type of diabetes mellitus patients is not compliant or does not routinely perform physical activities and lack of knowledge about diabetes mellitus can trigger hyperglycemia and blood sugar stability so it is expected that all diabetics who follow Prolanis activities must be routine and obedient so that blood sugar levels can be stable.

According to researchers knowledge will always support health conditions and this is a scourge and weapon for the community to be able to live free from chronic diseases. For example, diabetes mellitus patients are increasingly given counseling increasingly indifferent to the health conditions they experience. This can also be influenced because patients are very hopeful and dependent on the consumption of drugs and is a major alternative. According to Becker and Pratt in Niven (2013), factors that cause non-compliance to follow the education include beliefs, attitudes, family support, and personality [16].

The majority of non-compliance participants Prolanis in carrying out physical activity because respondents at work rarely stand up, at leisure rarely cycling, have light work, physical activity at leisure is rarely done. According to Putri in 2015, factors affecting non-compliance included individual busyness, lack of exercise habits, lack of advice and infrastructure, and the elderly [17].

According to researchers, lack of physical activity can also cause an increase in blood sugar levels. During exercise the muscles become more active and there is an increase in membrane permability as well as an increase in blood flow as a result more capillary membranes are opened and more insulin receptors are active and there is a shift in energy use by muscles originating from fatty acid sources to the use of glucose and muscle glycogen. Exercise is part of planned and structured physical activity with repetitive movements to improve or maintain physical fitness [18].

The results of this study are in line with research conducted by Primahuda and Sujianto in 2016 at the Babat Health Center in Lamongan District. There is a relationship between adherence to follow Prolanis and blood sugar stability in type 2 diabetes mellitus patients at the Babat Health Center in
The results of this study are also supported by Syuadzah’s research. 2015, that there is a significant relationship between adherence to follow prolanis activities with HbA1c levels in patients with diabetes mellitus [19]. The results of a study conducted by Putri and Isfandiari in 2013, that there is a relationship between the four pillars of diabetes management include education, exercise, eating arrangements, and medication adherence to the average blood sugar [20].

The success of a program is influenced by diabetes mellitus patients' compliance in carrying out therapy, the availability of supporting resources, and the implementation of the program routinely and continuously.

CONCLUSION

Compliance with prolanis is related to the stability of blood sugar levels in patients with diabetes mellitus at the Lumpue Health Center in Parepare City, therefore patients with type 2 diabetes mellitus are expected to routinely or obediently follow prolanis activities at the puskesmas such as gymnastics, education, blood sugar level examination to reduce blood sugar levels and 2 hours post prandial [21].

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REFERENCES


