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(RESEARCH ARTICLE)

Family support and associated with glycemic status in patients with type 2 diabetes mellitus

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Abstract

Diabetes mellitus is a disease that can cause sufferers to experience an increase in blood glucose levels in their body. Increased blood glucose levels can be prevented by implementing self-care routinely and getting support from the family.

Objective: To find out there is a relationship between the family support with glycemic status in patients with type 2 diabetes at the Banyuanyar Health Center.

Methods: Using a descriptive quantitative correlation research with a cross-sectional approach. The population of this study were patients with type 2 diabetes mellitus at the Banyuanyar Health Center as many as 469 people. Sampling technique using probability sampling with simple random sampling obtained a large sample of 99 respondents. Data collection by using a questionnaire. Data analysis using Pearson Product Moment.

Results: 77 respondents had sufficient family support and 68 respondents had diabetes mellitus on their glycemic status. The results of the analysis show that there is a significant relationship between family support and glycemic status where the significant value (p-value) is 0.0001 <0.05. The correlation coefficient value between family support and glycemic status is -0. There is a relationship between the family support and associated with glycemic status (p-value 0.0001).

Conclusion: There is a relationship between the family support and associated with glycemic status in type 2 DM patients at the Banyuanyar Health Center.

Keywords: Family support; Glycemic status; Type 2 DM patients; Patients

1. Introduction

Diabetes mellitus is a disease that can cause sufferers to experience an increase in blood glucose levels in their body. Diabetes mellitus gradually can cause complications in several organs of the body such as blood vessels, heart, kidneys, eyes and nerves. The most common diabetes mellitus found in Indonesia is type 2 diabetes mellitus, where the body is unable to produce enough insulin in the body [1]. According to the Indonesian Ministry of Health in 2019, diabetes is a serious chronic disease that occurs when the body does not have enough insulin to break down glucose into energy in the body. Diabetes mellitus has a prevalence and the number of cases has increased over the last few decades. This

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makes diabetes as one of the 4 non-communicable diseases that are a priority and require special attention from world leaders [2].

The prevalence of diabetes mellitus continues to increase every year in the world, one of which is Indonesia. This disease is one of the leading causes of death and disability in several countries [3]. The prevalence of type 2 diabetes mellitus in the last three decades has continued to increase drastically in low-income countries. Worldwide, there are about 422 million people with diabetes, around 1.6 million people die from diabetes each year, and the majority live in low- and middle-income countries. By 2025 there are globally agreed targets to stop the rise in diabetes and obesity. The results of the 2018 National Basic Health Research, the proportion of diabetes mellitus in Indonesia with Disrupted Fasting Blood Glucose (GDPT) is around 26.3%, while with Impaired Glucose Tolerance (TGT) is around 30.8%. The prevalence of diabetes mellitus in urban areas is 1.9% higher than in rural areas 1.0%. The highest ranking for the prevalence of diabetes mellitus for all ages by province is DKI Jakarta. Central Java Province ranks twelfth [4]. Data from the Central Java Health Office in 2019, diabetes mellitus ranks second after hypertension. In 2019 the number of people with diabetes mellitus was 411,750 cases with a percentage of 13.39% [5]. There were 21,935 cases of diabetes mellitus in Surakarta City and 467 cases of diabetes mellitus at the Banyuanyar Health Center [6].

Diabetes mellitus itself requires continuous therapy in order to control glucose levels well, not only pharmacological therapy is needed but non-pharmacological therapy is also needed to maximize glycemic status with self-care measures [7]. Self-care is an action to increase the ability and awareness of self-care independently in order to prevent complications, control glycemic levels properly, and maintain quality of life. Self-care can also increase HbA1c on target and shorten hospital stays [8]. Self-care for diabetes can be done by adjusting the diet (diet), physical activity or exercise, monitoring blood sugar, adherence to medication consumption, and foot care [9,10]. Examination of blood sugar levels is one of the most important self-care behaviors for people with diabetes mellitus to control glucose within normal limits and improve their quality of life. Patients' failure to control blood glucose in the long term due to lack of patient knowledge about the disease and its treatment is one of the triggers for the high diabetes mortality rate [11].

Based on the results of interviews conducted by researchers with 10 DM patients, the results showed that the awareness of diabetics was not optimal in performing self-care independently, which was indicated by only 4 of the 10 patients who did regular exercise, 3 who routinely did foot care, and 3 people. Which regulates diet. Cases of complications in patients with diabetes mellitus can be prevented by making changes to a better and healthier lifestyle. But the fact is that every year people with diabetes mellitus continue to increase, this is because most of the sufferers are not able to perform self-care optimally [12]. It is hoped that by doing self-care, patients can control their glycemic status. Self-care is a direct effort that can familiarize the patient to live a healthy life.

Diabetes is a chronic disease that requires therapy and care for a long time and can cause saturation in the patient. Therefore, internal and external motivation is needed to control glycemic status. One of these external motivations is family support [13]. Control of the patient's blood sugar level is one of the important things that needs to be done to reduce the incidence of complications in diabetic patients, but this needs to be accompanied by strong family support so that diabetic patients can perform self-care properly [14]. Based on preliminary interviews conducted by researchers regarding indicators of family support for 10 diabetics at the Puskesmas, it was found that 77.5% of patients' families did not provide support for the healing process of diabetic patients. It is hoped that positive family support can control the patient's glycemic status [9].

Based on the preliminary study above, the researcher is interested in conducting research on "the relationship between the family support with control of glycemic status in patients with type 2 DM".

2. Material and methods

This study uses a descriptive quantitative correlation with a cross-sectional approach. The study population was type 2 DM patients at the Banyuanyar Health Center as many as 469 patients. Sampling technique using probability sampling with simple random sampling obtained a large sample of 99 respondents. Collecting data using a questionnaire. Data analysis using Pearson Product Moment.

3. Results

3.1. Characteristics of Respondents

Based on table 1, it can be seen that the gender category of the number of female respondents was 63 (63.6%) higher than the male respondents as many as 36 (36.4%). In the age category the most were in the age range of 56-70 years with a total of 61 (61.6%) and the least in the age range of 71-85 years with a total of 9 (9.1%). In the category of education level, the highest number of graduates is senior high school with 37 respondents (37.4%) and at least 4 respondents (4%). In the occupational category, the majority of respondents did not work, namely 45 respondents (45.5%). In the weight category the most in the 55-69 kg range totaling 59 respondents (59.6%) and the least being in the 85-99 kg range totaling 5 respondents (5.1%).

Table 1 Characteristics of Respondents

Characteristics	Category	Frequency	Percentage (%)	Mean ± SD
Gender	Man	36	36.4	
	Woman	63	63.6	
Age	41-55	29	29.3	1.80 ± 0.589
	56-70	61	61.6	
	71-85	9	9.1	
Education	No school	6	6.1	
	Primary School	31	31.3	
	junior high school	21	21.2	
	high school	37	37.4	
	Bachelor	4	4.0	
Work	Does not work	45	45.5	
	civil servant	4	4.0	
	Retired	11	11.1	
	Businessman	3	3.0	
	Private sector employee	27	27.3	
	entrepreneur	9	9.1	
BMI	Normal	28	28.3	2.38 ± 1.076
	Fat	22	22.2	
	Obesity I	32	32.2	
	Obesity II	17	17.2	

3.2. Frequency Distribution of Family Support

Table 2 Frequency Distribution of Family Support

Family support	Frequency	Percentage (%)	SD ± mean
Good	17	17.2	1.88 ± 0.458
Enough	77	77.8	
Not enough	5	5.1	
Total	99	100%	

Based on table 2 shows that of the 99 respondents, most of them have sufficient family support as many as 77 respondents (77.8%) with an average value of 1.88 ± 0.458.

3.3. Frequency Distribution of Glycemic Status

Table 3 Frequency Distribution of Glycemic Status

glycemic status	Frequency	Percentage (%)	SD ± mean
Normal	18	18.2	1.49 ± 0.787
Prediabetes	13	13.1	
DM	68	68.7	
Total	99	100	

Based on table 3 shows that of the 99 respondents, most of them had diabetes mellitus glycemic status as many as 68 respondents (68.7%) with an average value of 1.49 ± 0.787.

3.4. Relationship of family support with glycemic status

Table 4 Relationship between Family Support and Glycemic Status

glycaemic status						
Family support	**DM**	**Prediabetes**	**Normal**	**Amount**	**P**	**R**
Not enough	5 (5.1%)	0 (0.0%)	0 (0.0%)	5(5.1%)	0.0001*	-0.681
Enough	63(63.6%)	9 (9.1%)	5 (5.1%)	77(77.8%)		
Good	0 (0.0%)	4 (4.0%)	13(13.1%)	17(17.2%)		
Total	68(68.7%)	13(13.1%)	18(18.2%)	99 (100%)		

*Test *Pearson Product Moment*

Based on table 4 the result showed that from 5 respondents (5%) had less family support with DM glycemic status, 77 respondents (77.8%) had sufficient family support where 63 respondents had DM, 9 respondents (9.1%) had prediabetes and 5 respondents (5.1%) had normal glycemic status. Furthermore, 17 respondents (17.2%) had good family support where the glycemic status of 4 respondents (4.0%) had prediabetes and 13 respondents (13.1%) had normal glycemic status. The results of the analysis show that there is a significant relationship between family support and glycemic status where the significant value (p-value) is 0.0001 <0.05, then Ha is accepted and H_0 is rejected. The correlation coefficient value between family support and glycemic status is -0.

4. Discussion

4.1. Characteristics of respondents

The results of the study revealed that the gender of the respondents were mostly women. Diani et al (2018) said that gender had an effect on the incidence of diabetes in a person, in his research said that the female gender had a higher risk of developing diabetes mellitus compared to men [15]. This is because women's body mass index has the opportunity to face a greater increase than men. This is in line with research conducted by Nurayati & Adriani (2017) where most of the patients with type 2 DM are female, this is because women have higher LDL (low density lipoprotein) than men [16].

The results showed that the majority of respondents had an age range of 56-70 years. Some studies say that type 2 diabetes generally occurs in old age, but this latest study found that children and young adults are also quite susceptible to diabetes with high obesity rates, poor diet and lack of physical activity in a day. One of the risk factors for diabetes mellitus is age because it is associated with a decrease in pancreatic cell function due to inadequate insulin production

and the body's inability to fully respond to insulin, often referred to as insulin resistance [7]. This leads to research conducted by Melaku et al (2020) which states that DM sufferers will increase with age, but will decrease at the age of 65 years [14]. This leads to research conducted by Hakim et al (2017) which states that a person is more at risk of developing type 2 diabetes mellitus when aged 45 years due to a decrease in body function [11].

The results of the characteristics of the education level of the respondents are mostly high school. The results of this study are in line with research conducted by Muhasidah (2017) where most of the respondents at the high school education level said that the higher the patient's ability to manage diabetes mellitus could affect the behavior of the patient in controlling blood glucose levels, because knowledge is an important domain to shape one's behavior [17]. The results of this study are in line with research conducted by Hu *et.al,* (2021) which states that most DM sufferers are high school graduates that the higher the level of education, the easier it is for a person to receive good information, understand the importance of routinely controlling glycemic status and have knowledge in self-care [18].

The results of the job characteristics of the respondents mostly do not work. This leads to previous research conducted by Diani et al (2018) with the result that some respondents do not work, saying that work is closely related to physical activity, Physical activity has a fairly close relationship with the incidence of type 2 diabetes because when people with diabetes do activities, the glucose in the body is converted into energy so that insulin increases resulting in reduced blood glucose levels [15].

The results of the characteristics of the body mass index of respondents mostly have obesity nutritional status I. This leads to a previous study conducted by Suryanti et al (2019) based on the results of the body mass index of people with diabetes mellitus mostly having normal nutritional status or obesity I, saying that patients with Diabetes mellitus with obesity insulin cannot work optimally due to high fat levels which can inhibit glucose absorption in the body [19]. This also leads to research conducted by Hartono (2013) based on BMI results, most respondents are obese I, saying that high free fat deposits can stimulate fat oxidation which in turn inhibits the use of glucose in muscles [20].

4.2. Family support

Based on the results of the frequency distribution of family support that has been carried out, it shows that most of the respondents have sufficient family support. Families provide family support by providing informational support regarding the latest information about diabetes and providing advice, emotional support by providing attention and understanding, instrumental support by providing assistance, and appreciation support by reminding sufferers if they forget [7,21]

The family has an important role that can affect a person's psychological health condition to improve glycemic status which can affect the quality of life of people with type 2 diabetes. This is in accordance with research conducted by Pamungkas (2017) which states that family support in the form of warmth and friendliness such as emotional support is related to glucose monitoring, diet and exercise can improve patient self-efficacy so as to support success in self-care[7]. The results of this study are also in line with research conducted by Luthfa (2020) which said that family support in the form of information, instruments [22]

4.3. Glycemic Status

Based on the results of the frequency distribution of glycemic status shows that most of the respondents have diabetes mellitus. Checking blood sugar levels is one of the most important self-care behaviors for people with diabetes mellitus in order to control blood glucose within normal limits and improve their quality of life [23]. Controlling blood glucose levels in DM patients is not enough if they do not get support from their families in motivating DM patients to control blood sugar [18].

4.4. Relationship between Family Support and Glycemic Status

The results of hypothesis testing using bivariate analysis showed that there was a significant relationship between family support and glycemic status.

Based on the results of the study, it was stated that families who provide good family support for diabetics can reduce glycemic status in these patients. This supports the research conducted by Luthfa (2020) which states that family support is the most dominant component in controlling glycemic status [22]. DM patients who get good support from their families can affect the patient's comfort in controlling glycemic status. The results of this study lead to previous research conducted by Pmungkas (2017) which stated that the physical and psychological comfort of DM patients in controlling glycemic status was influenced by family support [7].

5. Conclusion

The results of the research related to the characteristics of respondents at the Banyuanyar Health Center found that most of the respondents were female, aged 56-70 years, most of them had high school education levels, most of them did not work, and most of the respondents' body mass index had obesity nutritional status I. Family support for people with type 2 DM at the Banyuanyar Health Center, most of the respondents have sufficient family support. Glycemic status in patients with type 2 DM at the Banyuanyar Health Center, most of the respondents showed that their glycemic status had diabetes mellitus. There is a relationship between family support and glycemic status in patients with type 2 diabetes at the Banyuanyar Health Center.

Compliance with ethical standards

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Disclosure of conflict of interest

The authors hereby declare that there is no conflict of interest among them or with any person/organization.

Statement of ethical approval

The ethical clearance was obtained from the Commission of Health Research Ethics at RSUD Dr. Moewardi/FK UNS Surakarta (Number: 1.292/XII/HREC/2020).

Statement of informed consent

Prospective Participants were invited and oriented on the purpose of this study, namely to examine the family support and associated with glycemic status in patients with type 2 diabetes mellitus. Informed consent was obtained before the study and the participants were allowed to withdraw at any time.

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