CORRELATION BETWEEN FAMILY SUPPORT AND BLOOD SUGAR CONTROL COMPLIANCE IN THE PATIENT'S DIABETES MELLITUS TYPE II

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Abstract

Introduction: *Diabetes mellitus type II currently appears to be the world's highest disease prevalence with 424,9 million. Compliance with the control of blood sugar regularly is very important to reduce complications in patients with diabetes mellitus. To meet the problems above, there is a need for good family support. The purpose of this study is to know the correlation between family support and compliance with the control of blood sugar in patient's diabetes mellitus type II at Sleman General Hospital, Yogyakarta Province.*

Methods: *This research is quantitative research with a cross-sectional approach. The sample of this study amounted to 55 respondents, taken using a simple random sampling technique. The instrument in this study used family support questionnaires, interviews for regularity of blood sugar control, and crosschecking it in the medical records. The Spearman rank correlation test tested the data.*

Results: *Most of the 55 respondents have good family support (50,9%), compliance with control of blood sugar is good (61,8%), and the result of the statistical test obtained a p-value of 0,000 with a coefficient correlation of 0,609.*

Conclusion: *There is a significant correlation between family support and blood sugar control compliance in patient's diabetes mellitus type II. It's expected that the family can support the patients in compliance with treatment to improve their quality of life.*

Keywords: *Blood sugar, compliance, diabetes mellitus type II, family support*

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INTRODUCTION

Diabetes Mellitus (DM) is a state of hyperglycemia that arises when the body cannot produce insulin normally or insulin cannot work effectively. Insulin is a hormone produced by the pancreas and functions to transport glucose from food into cells which will then be converted into energy to meet the needs of muscles and tissues in carrying out their functions (International Diabetes Federation, 2017).

Type II diabetes mellitus is the type of diabetes with the highest prevalence. This is influenced by various factors including heredity and lifestyle consuming fast food. Fast food has a risk of causing obesity, where people with obesity have a chance of 4 times greater experiencing type II DM than people with a normal status of nutritional (WHO, 2017). Based on data from the *International Diabetes Federation* (2017), estimated that the incidence of DM will increase sharply to reach 628.6 million people in 2045 in Southeast Asia and Africa. In Indonesia, diabetes mellitus is the third highest cause of death with a percentage of 6.7%. In the province of D.I Yogyakarta, the percentage of diabetes mellitus is 2.6% (Kemenkes RI, 2013).

Type II diabetes mellitus has an impact on all aspects and has the risk of experiencing increased complications that can be life-threatening if not handled and not properly controlled. According to PERKENI (2011), the management of diabetes mellitus consists of education, diet, physical exercise, pharmacological intervention, and monitoring of blood sugar levels. Control of blood sugar levels for people with DM is very important to determine the right treatment so that it can reduce complications, help patients manage their diet, and repair insulin needs and daily blood sugar levels (Benjamin, 2010).

Complying with diabetes mellitus routinely is not an easy thing for patients to do. One of the factors that influence a person's compliance with therapy is family support (Hadjman, 2014). Family support is family acceptance of its members who are supportive and always ready to provide help and assistance if needed (Friedman, 2014). Family support can motivate patients to adhere to the management of their disease care and can improve the quality of life of patients (Noviarini, N. A., Dewi, M. P., & Prabowo, 2013). According to Rasyidah (2018), family support also has a significant relationship with self-management behavior in people with type II diabetes mellitus.

The results of a preliminary study conducted by researchers at Sleman General Hospital obtained data on the number of type II diabetes mellitus patients in the past year (2018) a total of 121 patients. The results of interviews with 5 type II DM patients, it was found that 2 people received good family support, namely they were always reminded and accompanied by their families to control their blood glucose levels regularly, while 3 people did not get family support because they lived alone and their children were busy working. Based on the background above, this research was conducted to know the correlation between family support and blood sugar control compliance in type II diabetes mellitus patients at Sleman General Hospital.

METHODS

Study Design

This research is quantitative research with a correlation descriptive design with a cross-sectional approach, which aims to reveal the correlation between independent variables and dependent variables that are measured simultaneously at the same time.

Population, Samples, and Sampling

The population of this study were all type II diabetes mellitus patients who were registered at the Sleman General Hospital, a total of 121 patients. The sample in this study was 55 respondents who met the inclusion and exclusion criteria which were taken by simple random sampling using a lottery technique in June-July 2019. The inclusion criteria in this study were 1) willingness to become research subjects with informed consent, 2) men and women aged ≥ 30 years, 3) diagnosed with type II diabetes mellitus ≥ 3 months, 4) live with family, 5) last education at least graduated from elementary school. Meanwhile, the exclusion criteria for this study was that respondents were not present at the time of data collection.

Instruments

The instrument on the independent variable of family support is adopted from Wihanyu, Lestari, & Anwar (2018) questionnaire. This family support questionnaire consists of 29 statements (22 favorable statements and 7 unfavorable statements) with a good category if the total score is 87-116, moderate if the total score is 58-86, and bad if the total score is 29-57. This questionnaire has been tested for validity and reliability with an r count of 0.467 to 0.889 and a Cronbach α value of 0.975.

Instruments on the dependent variable of compliance to control blood sugar levels use interview guidelines and cross-check the patient data from medical records. The interview guide for compliance to blood sugar control consists of 5 questions that were compiled by the researchers themselves according to the theoretical assessment and the data needs to be known. The category is revealed to be good compliance to blood sugar control if checking blood sugar levels once a month, moderate compliance if checking blood sugar levels once every 2-3 months, and poor compliance if checking blood sugar levels once every > 3 months.

Procedure

Respondents who were selected to be the research sample were asked for their willingness to become research respondents with informed consent. Before the respondents filled out the family support questionnaire, the researchers first conducted interviews related to compliance with blood sugar control for 5 minutes by giving the same questions to each respondent using an interview guide. Furthermore, a cross-check was carried out using the respondent's medical record to match the results of the answers to the compliance interview on blood sugar control that had been conducted on the respondent with the data in the medical record. If the respondent who has been selected as the research sample is not willing to become a respondent, a re-draw technique will be carried out to get a new sample until the number of samples is fulfilled.

Data Analysis

The research data that has been obtained are then analyzed using the SPSS program. Data analysis in this study included univariate analysis and bivariate analysis. Univariate analysis was used to determine the frequency distribution of the respondent's characteristics which included age, gender, education, and length of illness of the respondent. Bivariate analysis used the Spearman rank correlation test because the two variables were on an ordinal scale. This bivariate analysis was used to determine the correlation between family support and blood sugar control compliance in patients with type II diabetes mellitus at

Sleman General Hospital. The two research variables are stated to be significantly related if the value of ρ < 0.05. The closeness of the correlation between the two variables is analyzed using the correlation coefficient, where the value of r is getting closer to 1, meaning the correlation is getting higher.

Ethical Clearance

This research underwent ethical due diligence at the Sleman Hospital Health Research Ethics Commission on June 14 2019 with number 180/1905.

RESULTS

Based on Table 1 it can be seen that most of the respondents were aged 36-45 years namely 15 respondents (27.3%), the majority were female namely 30 respondents (54.5%), and most of them had high school education 21 respondents (38.2%), and the length of illness was at most 3-8 years namely 40 respondents (72.7%).

Based on Table 1 it is also known that the majority of respondents have good family support namely 28 respondents (50.9%), moderate family support as many as 21 respondents (38.2%), and bad family support as many as 6 respondents (10.9 %). Based on the age characteristics of the respondents, the majority of respondents aged 36-45 years had moderate family support namely 11 respondents (20.0%). Based on gender characteristics, there was no difference in family support between men and women namely 14 respondents (25.5%) received good family support. Based on the educational characteristics of the respondents, respondents with college education received good family support namely 10 respondents (18.2%). Based on the characteristics of the length of illness suffered by the respondents, as many as 17 respondents (30.9%) with a duration of illness of 3-8 years received family support in the good category Meanwhile, the level of anxiety in the control group (inhale) the lowest was 45 and the highest was 69.

Table 1 Correlation Correlation Between Respondents' Characteristics and Family Support (n=55)

Respondents' Characteristics	Family Support						Total	
	Good		Moderate		Bad			
	f	%	f	%	f	%	f	%
1. Age								
26-35 years	1	1,8	2	3,6	1	1,8	**4**	**7,3**
36-45 years	4	7,3	11	20,0	0	0,0	**15**	**27,3**
46-55 years	7	12,7	4	7,3	2	3,6	**13**	**23,6**
56-65 years	9	16,4	3	5,5	1	1,8	**13**	**23,6**
> 66 years	7	12,7	1	1,8	2	3,6	**10**	**18,**2
2. Gender								
Male	14	25,5	8	14,5	3	5,5	**25**	**45,5**
Female	14	25,5	13	23,6	3	5,5	**30**	**54,5**
3. Education								
No School	1	1,8	0	0,0	0	0,0	**1**	**1,8**
Elementary School	6	10,9	1	1,8	3	5,5	**10**	**18,2**
Junior High School	2	3,6	5	9,1	0	0,0	**7**	**12,7**
Senior High School	9	16,4	9	16,4	3	5,5	**21**	**38,2**
College	10	18,2	6	10,9	0	0,0	**16**	**29,1**
4. Length of illness								
3-8 years	17	30,9	19	34,4	4	7,3	**40**	**72,7**
9-14 years	8	14,5	2	3,6	2	3,6	**12**	**21,8**
> 15 years	3	5,5	0	0,0	0	0,0	**3**	**5,5**
Total	**28**	**50,9**	**21**	**38,2**	**6**	**10,9**	**55**	**100**

Based on Table 2 it is known that as many as 34 respondents (61.8%) had good blood sugar control compliance, as many as 11 respondents (20.0) had moderate blood sugar control compliance, and as many as 10 respondents (18.2%) had bad blood sugar control compliance. Based on Table 2 it is also known that based on the age characteristics of the respondents, as many as 10 respondents (18.2%) aged 46-55 years and 56-65 years have good blood sugar control compliance. Based on gender characteristics, there was no difference between male and female respondents in compliance with blood sugar control as many as 17 respondents (30.9%) were in the good category. Based on the educational characteristics of the respondents, 14 respondents (25.5%) with high school education had good blood sugar control compliance. Based on the characteristics of the respondent's duration of illness, as many as 22 respondents (40.0%) who had suffered from the disease for 3-8 years had good blood sugar control compliance.

Table 3 shows that there is a significant correlation between family support and compliance with blood sugar control with a ρ-value of 0.000 (< 0.05), with a strong correlation where the r value is 0.609.

DISCUSSION

Characteristics of Respondents

The results showed that most of the respondents were in the adult category. According to Sudoyo et al (2009) after the age of 30 years results in changes in anatomy, physiology, and biochemistry. Changes in these body components include a decrease in the function of pancreatic beta cells that produce the hormone insulin, a decrease in target tissue cells that produce glucose, and a decrease in the nervous system and other hormones that can affect glucose levels. This is in line with Gratia's (2013) study which explained that there is a correlation between age and the incidence of type II diabetes mellitus, where increasing age has the risk of 9 times to experience type II DM.

Table 2 Correlation Between Respondents' Characteristics And Blood Sugar Control Compliance (n=55)

Respondents' Characteristics	Blood Sugar Control Compliance						Total	
	Good		Moderate		Bad			
	f	%	f	%	f	%	f	%
1. Age								
26-35 years	1	1,8	1	1,8	2	3,6	**4**	**7,3**
36-45 years	5	9,1	7	12,7	3	5,5	**15**	**27,3**
46-55 years	10	18,2	2	3,6	1	1,8	**13**	**23,6**
56-65 years	10	18,2	1	1,8	2	3,6	**13**	**23,6**
> 66 years	8	14,5	0	0,0	2	3,6	**10**	**18,2**
2. Gender								
Male	17	30,9	3	5,5	5	9,1	**25**	**45,5**
Female	17	30,9	8	14,5	5	9,1	**30**	**54,5**
3. Education								
No School	1	1,8	0	0,0	0	0,0	**1**	**1,8**
Elementary School	8	18,2	0	0,0	2	3,6	**10**	**18,2**
Junior High School	1	12,7	3	5,5	3	5,5	**7**	**12,7**
Senior High School	14	25,5	4	7,3	3	5,5	**21**	**38,2**
College	10	18,2	4	7,3	2	3,6	**16**	**29,1**
4. Length of illness								
3-8 years	22	40,0	9	16,4	9	16,4	**40**	**72,7**
9-14 years	9	16,4	2	3,6	1	1,8	**12**	**21,8**

Respondents' Characteristics	Blood Sugar Control Compliance						Total	
	Good		Moderate		Bad			
	f	%	f	%	f	%	f	%
> 15 years	3	5,5	0	0,0	0	0,0	**3**	**5,5**
Total	**34**	**61,8**	**11**	**20,0**	**10**	**108,2**	**55**	**100**

The results showed that most of the respondents were female. According to Sudoyo et al (2009), women are 3-7 times more at risk of developing diabetes mellitus than men. This is because women have higher levels of LDL or bad cholesterol than men, and there are also differences in carrying out daily activities and lifestyles which greatly affect the incidence of a disease (Sudoyo et al, 2009). These results are in line with Wardani and Isfandiari's (2014) study, where diabetes mellitus is more common in women than men.

The results showed that the education of most respondents was graduate from Senior High School. According to Heryati (2014), the level of education is one of the predisposing factors for realizing healthy behavior so a higher level of education makes it easier for a person or community to absorb information and implement it in behavior and daily lifestyle.

The results showed that most of the respondents experienced the disease for 3-8 years. DM patients are often undetected or unaware of having DM for 7 years before the diagnosis is made (Ramdhani, 2015). The results of Suardana, Rasdini, and Kusmarjathi's (2015) research stated that the longer a person suffers DM, have higher the risk of complications.

Family support

The results showed that most of the respondents had good family support, especially in patients with a disease duration of 3-8 years. The results of Suardana, Rasdini, and Kusmarjathi (2015) research, also show that DM patients get good support from their families in treating their disease. According to Friedman (2014), family support is attitudes, actions, and acceptance of sick patients, the family also functions as a support system that is always ready to assist if needed. Family support can be provided in the form of emotional support in the form of attention or empathy, appreciation support namely positive appreciation of family members so that family members feel valued, instrumental support namely support provided in the form of equipment or tangible objects such as giving money for the treatment of sick family members, and informational support namely support provided in the form of advice or suggestions for family members related to their illness (Friedman, 2014).

Table 3 Correlation Between Family Support And Blood Sugar Control Compliance (n = 55)

Family Support	Blood Sugar Control Compliance								*ρ-value*	r value
	Good		Moderate		Bad		Total			
	f	%	f	%	f	%	f	%		
Good	26	47,3	2	3,6	0	0,0	**28**	**50,9**		
Moderate	5	9,1	9	16,4	7	12,7	**21**	**38,2**	**0,000**	**0,609**
Bad	3	5,5	0	0,0	3	5,5	**6**	**10,9**		
Total	**34**	**61,8**	**11**	**20,0**	**10**	**18,2**	**55**	**100,0**		

The results of the study also showed that family support tended to decrease along with the duration of the disease suffered by the respondents. This

can be influenced by the saturation and fatigue of the family in caring for sick family members. According to Setiadi (2009), various factors influence families in providing support to their family members, namely internal factors which include the stage of development, education or level of knowledge, emotional and spiritual factors, and external factors which include family practices, socioeconomic and cultural background.

Blood Sugar Control Compliance

Based on the results of interviews and cross-checking of medical record data of DM patients, it is known that the majority have good blood sugar control compliance with the majority of respondents being adults, having high school education, and having an illness of 3-8 years. According to the RI Ministry of Health (2008), compliance in blood sugar control is said to be regular if it is done regularly for < 3 months. Blood sugar control is one way that can be used to see the results of the management of DM disease in the form of diet, exercise, and medication that has been carried out (Susanto, 2010).

According to Hestiana (2017), states that adults have a higher proportion of compliance with control management than the elderly. Adulthood is a time when a person has reached maturity both physically and psychologically so that he is wiser, has responsibility for his actions, and can solve problems well, is stable and calmer. Whereas in old age, a person usually experiences a rapid decrease in physical and psychological abilities (Hurlock, 1991).

Heryati (2014) explained that someone with higher education can more easily understand and comply with regular blood sugar control behavior than people with low education, where compliance to control management that is not carried out properly can be caused by a lack of knowledge about the importance of maintaining blood sugar levels to avoid of DM complications. This is in line with Prabowo, and Hastuti's (2015) study which showed that there was a tendency for higher dietary compliance in type II DM patients who had a higher level of education.

The results of the study also showed that the longer the respondent had the disease (> 15 years), the tendency for compliance with blood sugar control was in a good category. This can be influenced by the patient's experience and knowledge in managing the disease. This result is in line with the results of Yusra's (2011) research, which states that a long duration of illness can affect a person in complying with the management of their disease treatment. The results of the study by Senuk, Supit, and Onibala (2013), also explained that there is a correlation between knowledge and compliance with the DM diet. Good and continuous glycemic control can prevent acute complications and can reduce the risk of long-term complications (Sudoyo et al, 2009).

Correlation Between Family Support And Blood Sugar Control Compliance

Based on the results of the study, it was found that there was a significant correlation between family support and blood sugar control compliance in type II diabetes mellitus patients at Sleman General Hospital with the closeness of the correlation in the strong category. These results are in line with the results of AsAstuti's2016) research, namely that there is a correlation between family support and compliance with blood sugar

control in patients with diabetes mellitus. The results of the study by Senuk, Supit, and Onibala (2013) also stated that there was a correlation between family support and dietary compliance in DM patients.

Rachmaati and Kusumaningrum (2017) state that one of the factors that influence compliance with blood sugar control in patients with diabetes mellitus is family support. Support from family members is a strong indicator that can have a positive impact on self-care in patients with diabetes mellitus so that patients can comply with disease management (Hensarling, 2009). According to Setyawati (2018), high family support can change patient behavior so that patients have enthusiasm, confidence,e and a strong desire in the healing process, including controlling blood sugar levels. Setiadi (2009) also stated that family support has been proven to reduce mortality, recover more easily from illness, and have better emotional health.

Rachmawati and Kusumaningrum (2017) also stated that another factor that influences compliance in controlling blood sugar in DM patients is the patient's strong desire. High-strengthening patients will increase the level of awareness of patients in paying attention to their health (Safitri, 2013; Rachmawati, and Kusumaningrum, 2017). Other factors that also affect compliance with blood sugar control in patients with diabetes mellitus are education level, level of knowledge, economic factors, time or distance of residence from health facilities, family support, and health workers' support (Albherta, 2011; Safitri, 2013).

The limitation of this study was that the time used for data collection was inappropriate so most of the respondents were in a hurry to fill out the questionnaire, namely when the respondents were queuing for medicine or waiting for their turn to be examined at the outpatient polyclinic.

CONCLUSIONS

The results showed that there was a significant correlation between family support and compliance with blood sugar control in type II diabetes mellitus patients at Sleman General Hospital of Yogyakarta with a strong correlation.

Based on the results of this study, it is hoped that DM patients can motivate themselves to increase self-awareness of the importance of compliance with blood sugar control to determine the success of the therapy or treatment being undertaken. The patient's family is expected to always provide support to the patient in complying with the management of the treatment so that the patient's quality of life can improve. Future researchers can conduct further research related to the correlation between family support and other variables in the management of DM.

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CONFLICT OF INTEREST

There is no conflict of interest in this research.

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