

THE RELATIONSHIP FAMILY SUPPORT AND BLOOD SUGAR LEVELS IN DIABETES MELLITUS SUFFERERS TYPE 2

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ABSTRACT

Introduction: Type 2 diabetes mellitus (Type 2 DM) is a chronic disease whose prevalence continues to increase globally, including in Indonesia. Diabetes management requires family support which plays an important role in controlling the sufferer's blood sugar levels. **Objective:** The purpose of this study is to determine how blood sugar levels and family support relate to Type 2 DM patients at the Simpang Tiga Pekanbaru Community Health Center. **Methods:** This study was conducted at Simpang Tiga Health Center Pekanbaru using cross-sectional method and correlational design. Sampling was done by purposive sampling by selecting 97 people with type 2 diabetes mellitus as samples. Glucometer was used to test blood sugar levels and Hensarling Diabetes Family Support Scale (HDFSS) questionnaire was used to measure family support. Fisher Exact Test statistical technique was used for data analysis. **Results:** Of 97 respondents, 51 (52.6%) had DM for less than 10 years, and 46 (47.4%) for more than 10 years. Additionally, 53.6% of respondents reported good family support, while 61.9% had uncontrolled blood sugar (>200 mg/dL). Fisher Exact Test showed a significant relationship between family support and blood sugar levels ($p=0.037$). **Conclusion:** Blood sugar levels in people with Type 2 DM are significantly correlated with family support. The best possible family support will help control blood sugar levels and avoid problems from diabetes.

Keywords: Blood glucose levels, Diabetes mellitus type 2, Family support

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INTRODUCTION

Diabetes mellitus (DM) is a chronic or perennial disease that is a problem in the world, even in Indonesia. DM occurs when blood glucose levels exceed normal limits. This is caused by the body's promise to produce insulin hormones in sufficient quantities or to convince the body to use insulin effectively to maintain the balance of blood glucose levels (IDF 2021)

The incidence of Diabetes Mellitus (DM) in the world continues to increase every year. In 2020, the International Diabetes Federation (IDF) recorded a global DM prevalence of 463 million people (9.3%), which increased to 537 million people (9.6%) in 2021, and 586 million people (10%) in 2022 Based on data from the World Health Organization (2020) World Health Organization (WHO), China has the largest number of DM sufferers in the world, namely 140.87 million people (11.6%). Indonesia is ranked fifth with the number of DM sufferers amounting to 19.47 million people (8.7%) in 2020, and it is estimated that this number

will increase to 27.7 million in 2035. In Indonesia, DKI Jakarta has the highest prevalence of DM, namely 3.4%, followed by East Kalimantan (3.1%), and Riau in 14th place with a prevalence of 2.5% or around 17,643 sufferers (Riskesmas Kementerian Kesehatan RI 2018).

DM is divided into several types, namely type 1 DM, type 2 DM, and gestational DM, where type 2 DM is the most common. Type 2 DM is caused by a combination of genetic, lifestyle and environmental factors (PERKENI 2021). Management of type 2 DM can be done by maintaining blood sugar levels within the normal range through a healthy diet, regular exercise, use of medication, and routine screening and treatment. Family support plays a very important role in the successful management of DM, especially in terms of maintaining a healthy lifestyle, arranging a physical activity schedule, and ensuring the patient follows an appropriate diet (Susanti et al 2020)

Based on the results of previous research conducted Galuh and Prabawati (2021) shows

meaningful results between family support and self-management. The better the family support is felt, the more comfortable the patient feels and the better a person's self-management will be. Research by Susanti et al (2020) also shows that the lack of family support in type 2 DM patients can be caused by factors such as living alone at home which makes it difficult to control diet, negligence in following medication control schedules, and irregularities in taking DM medication. The results of the bivariate analysis showed a very significant correlation between the blood sugar levels of type 2 DM patients and the level of family support they received. The stronger the family support, the better the patient's blood sugar control. Thus, the role of the family in providing support and helping patients manage type 2 DM conditions is very important to achieve optimal blood sugar control.

Researchers conducted a preliminary study by interviewing five type 2 DM sufferers in the Simpang Tiga Pekanbaru health center working area on March 26 2024. After measuring the blood sugar levels of each respondent, four of the five DM sufferers had high blood sugar levels (>203 mg/ dl). Of the five patients, four were accompanied by family members. The results of interviews based on questionnaires showed that in the emotional dimension, all patients revealed that their families did not understand their feelings when they were sad and anxious regarding DM. In the appreciation dimension, the five patients also stated that their families did not remind them enough to control their blood sugar and have regular health checks. In the instrumental dimension, although the family helps in avoiding sweet foods and implementing an appropriate diet, they do not encourage patients to exercise. However, the family helped with medical costs. Meanwhile, in the information dimension, four out of five patients stated that their families did not provide adequate information about DM and did not provide enough advice and education about this condition. These findings provide an initial indication that strong family support can play an important role in influencing the level of success of patients in managing their type 2 DM condition.

The purpose of this study is to ascertain how blood sugar levels and family support relate to type 2 Diabetes Mellitus (DM) patients at the Simpang

Tiga Pekanbaru Community Health Center. Uncontrolled blood sugar levels are one of the main challenges in managing type 2 DM, which can increase the risk of serious complications, such as heart disease, kidney damage and visual impairment. Family support in the form of emotional, instrumental and informational is believed to influence the patient's ability to comply with treatment and live a healthy lifestyle necessary to maintain stable blood sugar levels. Therefore, further research needs to be carried out to identify the extent of the role of family support in managing type 2 DM and its relationship with controlling blood sugar levels in patients. The purpose of this study is to examine the connection between blood sugar levels and family support in Simpang Tiga Pekanbaru Health Center patients with type 2 diabetes mellitus.

METHOD

This research uses a descriptive correlation design with a cross-sectional approach, which aims to identify the relationship between independent and dependent variables at one measurement time. The research sample consisted of 97 respondents taken from the population of type 2 Diabetes Mellitus (DM) patients who met the inclusion and exclusion criteria. The sampling technique uses a purposive sampling method.

Inclusion criteria include patients who have been diagnosed with type 2 DM for more than three months, live in the work area of the health facility where the research is located, are willing to be research subjects, and live with immediate family members. Meanwhile, exclusion criteria include DM patients who have comorbidities such as cataracts, gangrene, tuberculosis (TB) or stroke.

The research instrument consisted of a questionnaire and a blood sugar measuring device (glucometer). The questionnaire used was the Hensarling Diabetes Family Support Scale (HDFSS) to measure family support, which includes four dimensions: emotional support, appreciation, instrumental, and information. The total number of questionnaire items is 29, with an ordinal scale grouped into good and poor support. The validity and reliability of the instrument have been tested in previous research, with results that meet standards.

In addition, a glucometer is used to measure intermittent blood sugar levels, which are classified as controlled (100-180 mg/dL) or uncontrolled (> 180 mg/dL).

The data collection procedure includes three stages: preparation, implementation, and final. In the preparation stage, researchers prepare a research design, apply for permission from the relevant agency, and carry out instrument testing. At the implementation stage, data was collected through direct interviews with respondents using questionnaires and checking blood sugar levels. Data collection was carried out by explaining the purpose of the research, asking for written approval via informed consent, and involving a home visit if necessary.

Data analysis is carried out in stages, starting from editing, coding, entry, to analysis. Univariate analysis is used to describe the frequency distribution of each variable. And also carrying out bivariate analysis aims to understand the differences or relationships between two variables, namely the independent and dependent variables. The statistical test used in this research is the alternative Fisher Exact Test.

RESULTS

Table 1 Frequency Distribution of Respondents Based on Length of Suffering from Type 2 DM (n=97)

Duration Of Suffering	Frekuensi (n)	Persentase (%)
<10 years	51	52,6
>10 years	46	47,4
Total	97	100

This research found that from a total of 97 respondents, the majority of respondents, namely 51 people (52.6%), were known to have suffered from type 2 diabetes mellitus for less than 10 years. Meanwhile, 46 respondents (47.4%) had suffered from type 2 diabetes mellitus for more than 10 years.

Table 2 Frequency Distribution of Respondents Based on Family Support Domain (n=97)

Family Support	Frekuensi (n)	Persentase (%)
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Emotional		
Low	45	46,4
Tall	52	53,6
Award		
Low	55	56,7
Tall	42	43,3
Instrumental		
Low	22	22,7
Tall	75	77,3
Information		
Low	97	100,0
tall	0	0
Total	97	100

This study found that from a total of 97 respondents, the majority of respondents received varying family support in each aspect. In the aspect of emotional support, 52 respondents (53.6%) received high support, while 45 respondents (46.4%) received low support. In the aspect of appreciation, 55 respondents (56.7%) received low support, while 42 respondents (43.3%) received high support. In the aspect of instrumental support, the majority of respondents, namely 75 people (77.3%) received high support, while 22 people (22.7%) received low support. However, in the aspect of information support, all respondents (100%) did not receive support from their families.

Table 3 Frequency Distribution of Respondents Based on Family Support (n=97)

Variable	Frekuensi (n)	Persentase (%)
Family Support		
Bad support	49	50,5
Good support	48	49,5
Total	97	100

Overall results, 49 respondents (50.5%) felt they received inadequate family support, while 48 respondents (49.5%) felt they received good family support.

Table 4 Frequency Distribution of Respondents Based on Blood Sugar Levels (n=97)

Variable	Frekuensi (n)	Persentase (%)
Blood Sugar Level		

Uncontrolled >180 mg/dl	62	63,9
Controlled 100-180 mg/dl	35	36,1
Total	97	100

This research found that from a total of 97 respondents, the majority of respondents, namely 62 people (63.9%), had uncontrolled blood sugar levels with results of more than 180 mg/dL. Meanwhile, 35 respondents (36.1%) had controlled blood sugar levels with results of less than 180 mg/dL.

Table 5 Relationship Family Support and Blood Sugar Levels (n=97)

Family Support	Blood Sugar Levels						P Value
	Uncontrolled >200 mg/dl		Controlled <200 mg/dl		Total		
	N	%	n	%	n	%	
Bad support	40	41,2	9	9,3	49	50,5	0,00
Good support	22	22,7	25	26,8	48	49,5	
Total	62	63,9	37	36,1	97	100	

The results of the analysis of the relationship between family support and blood sugar levels in type 2 Diabetes Mellitus (DM) sufferers at the Simpang Tiga Pekanbaru Community Health Center showed that the majority of respondents had poor family support and uncontrolled blood sugar levels (>180 mg/dL). Of the total 97 respondents, 40 respondents (41,2%) fell into this category. The statistical test carried out using the alternative Fisher's Exact Test produces a p-value of 0.00, which is smaller than the α value (0.05), so that H_0 is rejected and H_a is accepted. This shows that there is a significant relationship between family support and blood sugar levels in type 2 DM sufferers.

DISCUSSION

Suffering from Type 2 DM for a long time

The results showed that the majority of respondents in this study, 51 (52.6%) had suffered from type 2 DM for less than 10 years, while 46 (47.4%) had suffered from it for more than 10 years.

These results are in line with research Triastawan et al (2024) and Wiratman and Cahyati (2021), which also shows that the majority of type 2 DM sufferers have a disease duration of less than 10 years.

The duration of type 2 DM is closely related to the risk of complications, such as neuropathy and cardiovascular disease, which is higher in patients with a duration of more than 10 years (Sri Rahmi, Syafrita, and Susanti 2022). In addition, psychological aspects, such as disease-related fatigue (diabetes distress), are also often experienced by patients for a long duration, which can affect compliance with diabetes management. (Hariani et al. 2020). In conclusion, for early intervention to prevent complications and maintain patient quality of life.

Family Support

The research results showed that the majority of respondents 49 (50,5%) received good family support, while the other 48 (49,5%) had poor family support. The emotional and instrumental support dimensions showed high results, with families tending to provide attention, tangible assistance, and reminders in diabetes management. However, the appreciation support dimension is still low, 55 (56,7%) respondents reported low support, and no respondents received information support.

Lack of information support indicates limited family knowledge regarding diabetes management, which can influence the effectiveness of disease management. This result is different from research Susanti et al (2020) and Antoro et al (2023), which shows that the majority of respondents have poor family support. Factors such as busy families, lack of education, and disharmonious family dynamics can affect the quality of support (Galuh and Prabawati 2021). Poor family support can negatively impact patients psychological well-being and their diabetes management (Agustini et al. 2022). This research shows that family support, especially in the dimensions of information and appreciation, needs to be improved through education and better understanding, because the role of the family is very important in managing type 2 DM.

Blood Sugar Levels

The research results showed that the majority of respondents in this study, 62 (63.9%) had uncontrolled blood sugar levels (100-180 mg/dl), while 35 (36.1%) had controlled blood sugar levels. These results are consistent with previous research, such as by Ekasari and Dhanny (2022), Novitasari et al (2022) and Nursihhah et al (2021), which also shows that the majority of type 2 DM sufferers have uncontrolled blood sugar levels.

This condition is caused by insulin resistance, where the body's cells are not responsive to the insulin hormone even though the levels are sufficient. Other factors include a lack of understanding and compliance with disease management, unhealthy eating habits, low levels of physical activity, and a lack of regular health visits (Herti et al 2023). In conclusion, uncontrolled blood sugar levels in type 2 DM sufferers reflect the need for educational interventions, lifestyle improvements, and increased compliance with disease management to achieve optimal blood sugar control.

The results of this study show that there is a significant relationship between family support and blood sugar levels in people with type 2 diabetes mellitus at the Simpang Tiga Pekanbaru Community Health Center. The majority of respondents who had poor family support showed uncontrolled blood sugar levels, with a p-value of 0.00 ($p < 0.05$). These results strengthen the hypothesis that family support has an important role in controlling blood sugar levels in people with type 2 diabetes mellitus. Family support, whether in the form of emotional, information, or appreciation, can influence the patient's physical and psychological comfort, increase self-confidence, and improve motivation. patients in managing their diabetes.

This research is in line with previous studies showing that family support has a positive impact on patient compliance in managing their condition. Hariani et al (2020) stated that family support can increase the motivation of DM patients by providing emotional comfort and a sense of appreciation, which in turn will increase patient compliance in controlling blood sugar levels. This is consistent with the results of research by Anita and Daniel Hasibuan (2021) which states that patients who

receive family support tend to be more successful in maintaining their blood sugar levels.

In this research, it was found that information support and appreciation from the family were at a low level. All respondents (100%) reported not receiving information support regarding diabetes management, which indicates a deficiency in conveying information from the family. This lack of information support is one of the factors that can hinder patients' understanding of the importance of diabetes management, thereby reducing the effectiveness of their treatment and care. Research by Putri and Puspitasari (2024) emphasized that good information support can increase patient understanding, so that they are better able to manage their health conditions better.

The low level of appreciation support received by the majority of respondents can have a negative impact on patient motivation. Reward support is important to motivate patients to continue undergoing treatment and maintain a healthy lifestyle. When patients feel underappreciated, their motivation to adhere to treatment and diet may decrease. Research by Anita and Daniel Hasibuan (2021) shows that appreciation from the family can increase the patient's enthusiasm in controlling blood sugar levels.

The importance of emotional support from family cannot be ignored either. Lack of emotional support can increase stress, anxiety, or even depression in patients, which can ultimately worsen their diabetes management. When patients feel neglected or unsupported by their families, they may experience a decrease in their overall quality of life. that good family support can help maintain the patient's physical and psychological health, improve quality of life, and support patients in long-term care (Noor et al, 2022).

People with type 2 diabetes mellitus may benefit greatly from the best possible support from their families, whether it takes the form of knowledge, presents, or hands-on care. It is hoped that further researchers can conduct further research on the elements that cause low family support, especially in the dimensions of information and appreciation. The focus of research can be directed at family education regarding diabetes mellitus management, including diet, physical

activity, and medication, as well as the importance of providing appreciation to increase patient motivation. Family-based interventions are expected to be an effective strategy in supporting comprehensive diabetes management.

CONCLUSION

This study demonstrates that blood sugar levels in individuals with type 2 diabetes mellitus are significantly correlated with family support. This demonstrates how crucial family support is in determining how well blood sugar control works. It is anticipated that more researchers will look at the elements that contribute to low family support, particularly in the areas of appreciation and knowledge.

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