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ABSTRACT

Background: This study examines the relationship between family support and adherence to blood sugar control in patients with type 2 diabetes mellitus. Adherence to regular blood sugar control is a crucial factor in disease control and complication prevention. However, some patients with diabetes mellitus still do not regularly monitor their blood sugar. Therefore, this study is important to determine the role of family support in improving blood sugar control adherence, thus providing a basis for improving the quality of diabetes mellitus management.

Objective: The objective of this study was to determine the relationship between family support and blood sugar control compliance in patients with type 2 diabetes mellitus.

Methods: This research method used a quantitative approach with a correlational design and a cross-sectional approach. The study was conducted at the Simpang Tiga Community Health Center in Pekanbaru City with a sample of 110 type 2 diabetes mellitus patients selected using a purposive sampling technique. Data collection used the HDFSS family support questionnaire and the Guttman scale blood sugar control compliance questionnaire. Data analysis was performed univariately and bivariately using the Fisher's Exact Test.

Results: The results of the study showed that there was a significant relationship between family support and blood sugar control compliance in type 2 diabetes mellitus sufferers ($p\text{-value} = 0.001$).

Conclusion: This study shows a significant relationship between family support and adherence to blood sugar control in patients with type 2 diabetes mellitus. Good family support can improve patient adherence to routine blood sugar control, thereby helping control the disease and preventing complications.

Keywords:

Diabetes mellitus, Family support, Blood sugar control compliance

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Introduction

Type 2 diabetes mellitus is a non-communicable disease and a major global health problem. The number of people with diabetes continues to increase and can lead to serious complications if not properly managed.

Therefore, long-term management such as diet, physical activity, medication adherence, and regular blood glucose monitoring is required (Hinkle & Cheever, 2022).

Adherence to blood sugar control is an important factor in managing diabetes mellitus. However, many patients still do



not routinely monitor their blood glucose levels (Lin et al., 2023). This condition can be influenced by various factors, including individual and environmental factors.

Family support is one of the important factors that can influence patient adherence. Previous studies have shown that emotional, informational, and instrumental support from family can improve adherence to treatment and health monitoring (Krisdianto et al., 2024; Ersawati & Rosyid, 2024).

However, studies examining the relationship between family support and blood sugar control adherence in patients with type 2 diabetes mellitus are still limited. Therefore, this study aims to determine the relationship between family support and adherence to blood sugar control in patients with type 2 diabetes mellitus.

Method

Research Design

This study employed a quantitative research design with a correlational approach and a cross-sectional design. This design was used to determine the relationship between family support and adherence to blood sugar control in patients with type 2 diabetes mellitus at the same time.

Sample

This study was conducted in 2024 at a health care facility in Pekanbaru City. The population of this study was all 160 people with type 2 diabetes mellitus who attended health check-ups. The sample size of 110 respondents was selected using a non-probability sampling technique with a purposive sampling

method. The inclusion criteria for this study were patients with type 2 diabetes mellitus who were willing to participate, able to communicate well, and currently undergoing health check-ups. The exclusion criteria were respondents who did not complete the questionnaire. Data collection was conducted using the Family Support Questionnaire (HDFSS) and the Blood Sugar Control Adherence Questionnaire using the Guttman Scale. The data were then analyzed using univariate and bivariate analyses using the Fisher's Exact Test.

Measurement and Data Collection

The instruments used in this study were a questionnaire (HDFSS) to measure family support and a blood sugar control adherence questionnaire using the Guttman scale. The HDFSS questionnaire is an instrument adopted from previous research to assess family support for people with diabetes mellitus. This instrument consists of several statements that measure the forms of emotional, informational, and instrumental support provided by families to patients.

Validity and reliability testing of the instruments were conducted in previous research and demonstrated that they were valid and reliable for use in this study. The measurement scale used a Likert scale for the family support questionnaire and a Guttman scale for the blood sugar control adherence questionnaire. Data collection was conducted by administering the questionnaires directly to respondents who met the inclusion criteria after obtaining consent to participate in the study.



Data Analysis

Data analysis in this study was conducted using univariate and bivariate analyses. Univariate analysis was used to describe the distribution of respondent characteristics and study variables. Bivariate analysis was used to determine the relationship between family support and blood sugar control adherence in patients with type 2 diabetes mellitus using the Fisher's Exact Test with a significance level of 0.05. Data processing and analysis were performed using computer software.

Ethical Considerations

This research adheres to the principles of research ethics. Prior to data collection, respondents were provided with an explanation of the research's purpose, procedures, benefits, and confidentiality. Respondents who agreed to participate were asked to sign an informed consent form as a form of agreement to participate in the research. This research has also passed the ethics review of the Ethics Committee Commission of Hangtuah University, Pekanbaru, under registration number 044/KEPK/UHTP/XII/2025.

Results

The results of the study aimed to determine the relationship between family support and blood sugar control compliance in type 2 diabetes mellitus patients were conducted from January 7 to January 21, 2026, at the Simpang Tiga Community Health Center in Pekanbaru City with a research sample of 110 respondents.

Respondent Characteristic

Table 1. Age Distribution of Respondents with Diabetes Mellitus

Variable	Median	Minimum	Maximum	Range
Age	64	45	87	42

Based on Table 1, it shows that the median age of type 2 diabetes mellitus sufferers at Simpang Tiga Health Center is 64 years. The lowest age of diabetes mellitus sufferers is 45 years and the highest is 87 years. The median was used because the respondents' age data was not normally distributed, so the median was considered more representative in describing age characteristics.

Table 2 Frequency Distribution of Respondents Based on Education Level, Gender, Occupation, Marital Status, Living in the Same House, and Length of Suffering from Type 2 Diabetes Mellitus in 2026

Respondent Characteristics	<i>f</i>	%
Education Level		
• Elementary School	8	7,3
• Junior High School	23	20,9
• Senior HighSchool	23	20,9
• d. College	56	50,9
Gender		
a. Male	45	40,9
b. Female	65	59,1

Respondent Characteristics	<i>f</i>	%
Occupation		
a. Housewife	25	22,7
b. Civil Servant	6	5,5
c. Retired	49	44,5
d. Farmer	12	10,9
e. Self-Employed	14	12,7
f. Unemployed	4	3,6
Marital Status		
a. Married	103	93,6
b. Widower/Widower	7	6,4
Living with Children		
a. Children	6	5,5
b. Husband/Children	31	28,2
c. Wife/Children	24	21,8
d. Husband/Wife	49	44,5
Duration of Diabetes Mellitus		
a. < 5 years	84	76,4
b. ≥ 5 years	26	23,6
Total	110	100,0

Based on Table 2, it can be seen that the majority have a final education of 56 people (50.9%) at the tertiary level, more women are 65 people (59.1%) than men. Most respondents work as retired civil servants 49 people (44.5%), the majority of marital status is still married 103 people (93.6%), more live with their husband/wife 49 people (44.5%), and the majority of type 2 diabetes mellitus sufferers <5 years, namely 84 people (76.4%).

Table 3 Frequency Distribution of Research Variables on Family Support in Type 2 Diabetes Mellitus Patients in 2026

Family Support	<i>f</i>	%
A. Poor	18	16,4
B. Good	92	83,6
Total	110	100

Based on Table 3 Frequency Distribution of Family Support, the majority of respondents with Type 2 Diabetes Mellitus are known to have good family support, namely 92 people (83.6%), while 18 people (16.4%) have poor family support.

Table 4 Frequency Distribution of Research Variables on Blood Sugar Control Compliance in Type 2 Diabetes Mellitus Patients in 2026

Control Compliance	<i>f</i>	%
a. Non-Compliant	10	9,1
b. Compliant	100	90,9
Total	110	100

Table 4 shows that the majority of respondents (100 respondents, 90.9%) had a high level of compliance with blood sugar control. Meanwhile, 10 respondents (9.1%) were non-compliant with blood sugar control.

Bivariate Analysis

Table 5. Relationship between Family Support and Blood Sugar Control Adherence in Patients with Type 2 Diabetes Mellitus in 2026

No	Family Support	Blood Sugar Control Compliance		Total n (%)	<i>p value</i>	OR (95% CI)
		Compliant	Disobedient			
		<i>f</i> (%)	<i>f</i> (%)			
1	Bad	10 (55,6%)	8 (44,4%)	18 (100%)	0,001	36,000 (6,699-193,467)
2	Good	90 (97,8%)	2 (2,2%)	92 (100%)		
Total		100 (90,9%)	10 (9,1%)	110 (100%)		

Source: Prime Data

Table 5 shows that of the 18 respondents with poor family support, 10 (55.6%) were compliant and 8 (44.4%) were non-compliant. Meanwhile, of the 92 respondents with good family support, 90 (97.8%) were compliant and 2 (2.2%) were non-compliant. The Fisher's Exact Test yielded a *p*-value of 0.001. This value is <0.05, indicating a relationship between family support and adherence to blood sugar control in patients with type 2 diabetes mellitus. The Odds Ratio (OR) analysis, a measure of the likelihood of an event occurring between two groups, yielded an OR of 36 with a 95% confidence interval (CI: 6.699-193.467).

Discussion

Age

The average age of respondents in this study was 64 years, which is considered elderly. This finding aligns with previous research by Simamora et al. (2024) that

The majority of diabetes mellitus sufferers, 35 respondents (45.5%), were aged 60-65 years. This finding is also supported by research by Umam, Solehati, and Purnama (2020), which showed that the majority of respondents (53.8%) with diabetes mellitus were aged 50-60 years. Furthermore, research by Rahmawati and Widodo (2022) found that the majority of respondents with diabetes mellitus were over 60 years old.

According to the theory of Brunner and Suddarth (2022), type 2 diabetes mellitus most often occurs in individuals over 45 years old. At this age, insulin sensitivity decreases and pancreatic beta cell function progressively declines, resulting in a decline in the body's ability to regulate blood glucose levels. This condition makes individuals from late adulthood to the elderly more susceptible to type 2 diabetes mellitus. These results indicate that the risk of diabetes mellitus begins to increase from middle age and continues into old age due to changes in metabolism and lifestyle.

Based on the above description, the author assumes that individuals over 45 years of age experience decreased immunity and less than optimal blood glucose control.

Gender

The results of the study showed that the majority of type 2 diabetes mellitus sufferers were female (65 people (59.1%)), while 45 people (40.9%) were male. This finding aligns with research by Simamora et al. (2024) with 56.7% female, Sari and Handayani (2022) with 58.7% female and 41.3% male, Rahmawati et al. (2023) with 62.1% female, Yulianti et al. (2022) with 65.1% female, and Nurdin (2021) with 55.3% female. This suggests that type 2 diabetes mellitus tends to be more prevalent in women, which may be influenced by unhealthy diets, hormonal changes, and higher body fat composition, which increases the risk of obesity. Furthermore, during menopause, insulin sensitivity

decreases, increasing susceptibility to type 2 diabetes mellitus.

Education

The results showed that the majority of respondents (56 respondents) had a college education, or 50.9%. This finding aligns with research by Simamora et al. (2024) at 70%, Siregar et al. (2022) at 32.8%, Wahyuni and Pratiwi (2023) at 29.3%, and Lestari et al. (2021) at 35.0% of respondents with a college education. This suggests that education plays a crucial role in the management of type 2 diabetes mellitus, as it is related to an individual's knowledge and understanding of health information. Individuals with higher education tend to have a better understanding of diet, physical activity, medication adherence, and blood sugar monitoring, enabling them to self-manage their disease and prevent complications.

Occupation

The results showed that the majority of respondents were retired (44.5%). This finding aligns with research by Siregar et al. (2022) at 42.3%, Primadani et al. (2022) at 46.7%, and Melisa et al. (2023) at 40.5% of respondents being retired. This indicates that retirees tend to have lower levels of physical activity, which can impact blood sugar control. Furthermore, lifestyle changes also contribute to blood sugar stability if not accompanied by good disease management. However, retirement status also provides a greater opportunity for regular health check-ups due to more flexible time. Therefore, retirement status is a dominant characteristic and is related to age,

physical activity, and lifestyle in managing type 2 diabetes mellitus.

Marital Status

The results showed that the majority of respondents were married (93.6%). This finding aligns with research by Primadani et al. (2022) at 91.4%, Sudrajat et al. (2023) at 89.7%, and Rahmawati et al. (2023) at 92.5%. This indicates that marital status, particularly being married, is a dominant characteristic in people with type 2 diabetes mellitus. Marital status has a positive impact on disease management due to the support from a partner, both emotionally and in the form of motivation, lifestyle monitoring, medication adherence, and health monitoring. Ongoing support can help maintain stable blood sugar levels and improve the quality of disease management.

Living in the Same House

The results showed that the majority of respondents (44.5%) lived in the same house as their spouse. This finding aligns with research by Nurhalilah and Sari (2025) at 41.8%, Sudrajat et al. (2023) at 46.2%, and Putri et al. (2021) at 43.5%. This suggests that spouses are the closest family members who play a vital role in the daily lives of people with type 2 diabetes mellitus. Living with a spouse allows for direct support in disease management, particularly in maintaining a healthy lifestyle, medication adherence, and health monitoring. Furthermore, as people age, spouses become the ones who interact and provide the most support compared to other family members.

Duration of Diabetes

The study results showed that the majority of respondents (84 people) had suffered from type 2 diabetes mellitus for less than 5 years (76.5%). This finding aligns with research by Sudrajat et al. (2023) at 74.6%, Ester et al. (2023) at 52.2%, and Melisa et al. (2023) at 86.2% of respondents with a disease duration of less than 5 years. This indicates that most patients are in the early adaptation phase of disease management. The duration of diabetes mellitus plays a significant role in a patient's understanding and experience in managing their disease. A shorter duration is associated with the learning process of adopting a healthy lifestyle and controlling blood sugar, while a longer duration can increase the risk of complications if not balanced with proper management. Therefore, ongoing health education and support are needed to help patients maintain glycemic control and prevent complications.

Family Support

The results showed that the majority of respondents (83.6%) had good family support, while 16.4% still had poor family support. This finding aligns with research by Setiawati and Nindya (2024) that found 91.3% had good support and 8.7% had poor support, Anita and Hasibuan (2024) that showed a majority had good support with around 14-18% had poor support, and Zanzibar and Akbar (2023) that found around 6% had poor family support. This indicates that, in general, people with type 2 diabetes mellitus receive good family support, although some may not receive optimal support. Family support plays a crucial role in

disease management, including emotional support, information, medication assistance, reminders about healthy lifestyles and regular check-ups. Therefore, healthcare professionals need to play a role in educating families so that support can be more optimal and sustainable.

Blood Sugar Control Compliance

The study results showed that the majority of respondents with type 2 diabetes mellitus (90.9%) were compliant with their blood sugar control, while 9.1% were non-compliant. This finding aligns with research by Wahyuni and Pratiwi (2023) that found 70.7% compliant, Siregar et al. (2022) that showed 67.2% compliant, and Lestari et al. (2021) that found 65.0% of respondents had good compliance. This high level of compliance is influenced by a good understanding of the importance of blood sugar control, experience with the disease, and support from family and healthcare professionals. Regular blood sugar control plays a crucial role in maintaining glucose stability and preventing complications. Therefore, ongoing efforts in the form of education, monitoring, and support from family and healthcare professionals are needed to maintain and improve patient compliance.

The Relationship Between Family Support and Blood Sugar Control Adherence in Type 2 Diabetes Mellitus Patients

The results of this study indicate a significant relationship between family support and blood sugar control adherence in type 2 diabetes mellitus

patients ($p\text{-value} = 0.001 < 0.05$). The strength of the relationship is indicated by an Odds Ratio (OR) of 36.000 (95% CI: 6.699-193.467), meaning patients with good family support are 36 times more likely to be adherent than those with poor support.

This finding aligns with research by Rahmawati et al. (2024), Unok (2024), Maulinda (2024), and Airini (2024), which indicates that family support is associated with increased blood sugar control adherence. Family support plays a crucial role in shaping adherence behavior through emotional support, appreciation, information, and assistance with treatment and lifestyle monitoring. Emotional support, such as attention, empathy, and companionship, can increase motivation and reduce stress, while reward support in the form of praise and positive reinforcement can boost patient confidence.

Furthermore, the family's role is evident in monitoring diet, providing medication reminders, and providing support during health check-ups. Other factors, such as patient knowledge, ongoing education, and access to healthcare facilities, also influence adherence. Overall, the better the family support provided, the higher the patient's adherence to blood sugar control and optimal disease management.

Implications and Limitations

The results of this study indicate that family support plays a crucial role in improving adherence to blood sugar control in patients with type 2 diabetes mellitus. Therefore, healthcare

professionals are expected to involve families in providing education and support to patients to improve the success of diabetes mellitus management. Research Limitations: The implementation of this study certainly has several limitations. This study did not directly observe respondents' behavior in blood sugar control; therefore, information regarding adherence was obtained based on respondents' reports through questionnaires. This situation may lead to differences between respondents' answers and the actual daily behavior of patients with type 2 diabetes mellitus at the Simpang Tiga Community Health Center in Pekanbaru.

Conclusion

Based on the results of a study of 110 respondents with type 2 diabetes mellitus, the majority were elderly, female, highly educated, unemployed, had had diabetes for several years, were married, and lived with their families. Most respondents had good family support and demonstrated good adherence to blood sugar control. Statistical analysis showed a significant relationship between family support and adherence to blood sugar control in patients with type 2 diabetes mellitus ($p\text{-value} = 0.001 < 0.05$). This indicates that respondents with good family support tended to be more compliant with blood sugar control compared to respondents with less good family support.

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