Correlation Between Family Support and Adherence to Insulin Therapy in Patients with Type 2 Diabetes Mellitus

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ARTICLE INFO	ABSTRACT
	Diabetes Mellitus (DM) is a chronic disease caused by the body's inability to use insulin optimally. Insulin therapy is an effective treatment to replace the role of the insulin hormone. Adherence to insulin therapy is crucial for the health of DM patients. This study investigates the correlation between family support and adherence to insulin therapy among type II DM patients at Gamping II Health Center, Yogyakarta. This study employed a quantitative cross-sectional design. Fifty-three type II DM patients who underwent control at Gamping II Health Center participated in this study. The family support instrument was measured using the Hensarling Diabetes Family Support Scale (HDFSS) Indonesian version, while adherence to insulin therapy was measured using the Morisky Insulin Adherence Scale-8 (MIAS). Kendall tau test was used for data analysis. The results showed a significant correlation between family support and adherence to insulin therapy among type II DM patients at Gamping II Health Center (p=0.011). Effective family support, in the form of assistance, attention, or information, is crucial in improving adherence to insulin therapy among type II DM patients. Therefore, family involvement is highly recommended to control blood sugar levels among type II DM patients.

INTRODUCTION

The global prevalence of Diabetes Mellitus (DM) continues to rise significantly every year. According to the International Diabetes Federation (IDF), approximately 537 million people worldwide, aged 20-79 years, live with diabetes (Federation_Global, 2020). The prevalence of DM in Indonesia was reported to reach 9.19% in 2020 and is predicted to increase to 16.09% by 2045 (Wahidin et al., 2024).The results of the 2023 Indonesian Health Survey showed that 59.1% of the causes of disability, including visual, hearing, and mobility impairments, were caused by non-communicable diseases such as DM. Ages above 45 years were reported to have a high prevalence (20.6%) of various DM complications (Riskesdas, 2018).

One of the DM complications that becomes a serious health problem is diabetic ulcers (Armstrong et al., 2023; Kim, 2023). Diabetes Mellitus (DM) is a chronic and incurable disease, but it can be managed to prevent hyperglycemia and related complications (Association, 2020). Therefore, effective treatment management, including insulin therapy, is crucial. Adherence to insulin therapy is essential for optimal blood glucose control and overall health outcomes in patients with type 2 DM (Schlosser, 2019). Non-adherence to treatment can lead to poor disease management and increased risk of complications. Patient adherence to insulin therapy is critical in achieving effective clinical outcomes and preventing complications (Al-Qahtani, 2024). Family support is a significant factor influencing patient adherence to therapy (Pamungkas et al., 2017). Family involvement can have a positive impact on health care outcomes, particularly for patients with type 2 DM (Almubaid et al., 2024).

Family support is a multifaceted construct that encompasses informational, emotional, appreciative, and instrumental aspects, which play a crucial role in the management of Diabetes

Mellitus (DM) (Zhao et al., 2020). Research has shown that family support can significantly influence insulin administration adherence, as it provides motivation and enables patients to effectively manage their blood glucose levels (Busebaia et al., 2023). A preliminary study conducted by the researcher among type 2 DM patients who underwent follow-up or control revealed that patients heavily rely on family members for insulin injections. This finding prompted the researcher to investigate the correlation between family support and insulin administration adherence among type 2 DM patients at Gamping II Community Health Center. The primary objective of this study is to examine the correlation between family support and insulin administration adherence in type 2 DM patients.

METHOD

This cross-sectional study aimed to investigate the correlation between family support and insulin adherence among patients with type 2 Diabetes Mellitus (DM). The study was conducted at the Gamping II Community Health Center in February 2025. The study population comprised patients with type 2 DM who underwent follow-up, control, or participated in the Prolanis program at the Gamping II Community Health Center. A total sampling technique was employed, where all population members were selected as respondents. Inclusion criteria included patients with type 2 DM who underwent follow-up, control, or participated in the Prolanis program at the Gamping II Community Health Center, lived with family members, and were excluded from patients with type 2 DM who no longer used insulin. This study was approved by the Health Research Ethics Commission of Aisyiyah University of Yogyakarta with number 4149/KEP-UNISA/I/2025.

Family support was assessed using the Hensarling Diabetes Family Support Scale (HDFSS) Indonesian version, consisting of 17 question items with a Cronbach's alpha value of 0.961. The Morisky Insulin Adherence Scale (MIAS) questionnaire, consisting of 8 question items, was used to measure adherence, with validity test results of 0.475-0.743 and a Cronbach's alpha value of 0.822 (Isnaeni et al, 2018). Data analysis to examine the correlation between family support and insulin adherence employed the Kendall tau statistical test.

RESULTS

The majority of respondents were female (62.3%), married or widowed (47.2%), and aged between 46-65 years (50.9%). Additionally, most respondents had a primary school education (41.5%) and had been suffering from Diabetes Mellitus (DM) for 1-5 years (43.4%). The majority of respondents were housewives (35.8%), and most used JKN Mandiri insurance (49.1%).

Family support for patients with type 2 Diabetes Mellitus (DM) at Gamping II Community Health Center is quite high. As many as 33 respondents (62.3%) reported receiving very supportive family support. Meanwhile, the level of insulin adherence in patients with type 2 DM shows that 30 respondents (56.6%) have a fairly obedient adherence level (summarized in Table 2). The results of bivariate analysis in Table 3 show that there is a significant correlation between family support and insulin adherence (p=0.011).

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Table 1. Characteristics of Respondents

Variable	f	%
Gender		
Male	20	37,3
Female	33	62,3
Marital Status		
Unmarried	3	5,7
Married	25	47,2
Widowed	25	47,2
Age		
20-45 years	8	15,1
46-65 years	27	50,9
>65 years	18	34
Education		
No education	6	11,3
Elementary school	22	41,5
Junior high school	9	17
Senior high school	12	22,6
Higher education	4	7,5
Duration of illness		
1-5 years	23	43,4
6-10 years	16	30,2
>10 years	14	26,4
Occupation		
Civil servant	3	5,7
Entrepreneur	13	24,5
Laborer	18	34
Laborer	19	35,8
Health insurance		
BPJS retiree	3	5,7
BPJS private	2	3,8
JKN independent	26	49,1
BPJS PBI	22	41,5

Table 2. Distribution of Characteristics of Family Support and Insulin Adherence in Type 2 Diabetes Mellitus

Variable	f	%
Family Support		
Less supportive	6	11,3
Supportive	14	26,4
Very supportive	33	62,3
Insulin Adherence		
Less adherent	6	11.3
Adherent	30	56.6
Very adherent	17	32.2

Table 3. Analysis of the Correlation Between Family Support and Insulin Adherence

Family Support	Insulin Adherence						Total		p-value
	Less adherent		Adherent		Very adherent				
	f	%	f	%	f	%	f	%	
Less Supportive	3	5,7	3	5,7	0	0,0	6	11,3	
Adherent	3	5,7	7	13,2	4	7,5	14	26,5	0,011
Very Adherent	0	0,0	20	37,7	13	24,5	33	62,2	
Total	6	11,3	30	56,6	17	32,1	53	100	

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DISCUSSION

Univariate analysis of respondent characteristics showed that 62.3% of respondents were female. This is consistent with previous research that found many type 2 Diabetes Mellitus (DM) patients were female, especially due to decreased estrogen and progesterone during menopause (Guo et al., 2019). Women in menopause experience aging processes that can affect insulin function. Additionally, most respondents were married or widowed and lived with their children. This indicates that family support is crucial in increasing adherence to insulin therapy among type 2 DM patients (Karvonen-Gutierrez et al., 2016). According to Farida (2018), health and disease can be influenced by family environment, culture, and socioeconomic factors (DiMatteo et al., 2002). As many as 50.9% of respondents were aged 45-65 years, and older age can affect organ function and the immune system, thereby affecting adherence to insulin therapy. Respondents' education also affects adherence to insulin therapy. As many as 41.5% of respondents had an elementary school education, and low education can affect respondents' ability to receive information about insulin management. Furthermore, 43.4% of respondents had been suffering from DM for 1-5 years, and family support is crucial in increasing adherence to insulin therapy among type 2 DM patients.

The results of this study indicate a significant correlation between family support and insulin adherence in type 2 Diabetes Mellitus (DM) patients at Gamping II Community Health Center. This finding is consistent with previous research that found family support plays a crucial role in increasing treatment adherence among DM patients (Olagbemide et al., 2021). Family support can have a positive impact on patients' adherence to insulin therapy, including providing attention, assistance, and necessary information. Lack of family support can lead to DM patients not using insulin correctly, especially if patients rely on family members to administer insulin injections. Therefore, highly supportive family support can help DM patients undergo insulin therapy more effectively. This study is also consistent with other research that found non-adherence to insulin therapy among DM patients is influenced by several factors, including patient motivation, lack of information related to therapy, and lack of social support from family and the surrounding environment (Wang et al., 2024). Family support can also help type 2 DM patients increase their confidence in undergoing treatment, which enables them to become more concerned and motivated to undergo treatment more effectively (Olagbemide et al., 2021). Family support is a form of care provided by the family, in the form of emotional, appreciation, information, and instrumental support (Tang et al., 2008).

The majority of type 2 Diabetes Mellitus (DM) patients have highly supportive family support, enabling them to be more adherent to insulin therapy. In addition to family support, the patient's level of knowledge also plays a crucial role in the success of treatment. Self-motivation to undergo therapy well is also essential in maintaining adherence to insulin therapy(Zewdie et al., 2022). Families have four aspects related to support for type 2 DM patients, namely emotional support, information, instrumental support, and appreciation. Type 2 DM patients who do not receive complete family support tend to feel that no one cares about their condition, which can affect their continuation of insulin therapy (Miller & Dimatteo, 2013). The study's findings may not be applicable to other regions in Indonesia due to the geographical and cultural diversity of the country, as this study was only conducted in Yogyakarta, Java.

CONCLUSION

Family support has a significant correlation with the adherence of Diabetes Mellitus (DM) patients to insulin therapy. In addition to family support, the motivation of type 2 DM patients is also a major factor in increasing the desire to maintain health, especially in maintaining optimal blood glucose levels. Therefore, increasing the role of families in controlling blood glucose levels in type 2 DM patients is highly recommended.

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AUTHOR'S DECLARATION

Authors' contributions and responsibilities
JJ: Writing, original draft, conceptualization; **WW:** Writing original draft; **RR:** Supervision, validation, review, and editing.

Availability of data and materials
All data are available from the authors.

Competing interests
The authors declare no competing interests.

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