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Original Research Paper

Family support and medication adherence in elderly diabetes patients at Kartasura Health Center

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Abstract
Diabetes mellitus (DM) is a chronic disease with a high prevalence among the elderly and requires long-term management. Older adults with DM often face challenges such as cognitive decline, physical limitations, and comorbidities, which can hinder adherence to therapy, making family support a crucial factor influencing medication adherence. This study aimed to examine the relationship between family support and medication adherence among elderly patients with DM at the Kartasura Community Health Center. A quantitative method with a cross-sectional design and a simple random sampling technique was employed, involving 91 respondents selected based on inclusion and exclusion criteria. Research instruments included a family support questionnaire and a modified Hill-Bone questionnaire, which had been tested for validity and reliability in previous studies. The results showed that most respondents were aged 60–69 years, female, junior high school graduates, self-employed, married, and had lived with DM for 1–5 years. The majority received good family support (79.1%) and demonstrated high medication adherence (96.7%), and the Spearman test indicated a significant relationship between family support and medication adherence ($p = 0.001$). In conclusion, family support plays a vital role in improving medication adherence among elderly patients with DM; therefore, healthcare professionals are encouraged to actively involve families in diabetes care programs, provide education for caregivers, and develop community-based interventions that strengthen family engagement to enhance adherence and health outcomes in elderly populations.

Keywords: diabetes mellitus; elderly; family support; medication adherence

1. Introduction

Diabetes Mellitus (DM) is a chronic blood disease characterized by high glucose levels due to impaired insulin production or utilization (Wawai et al., 2025). DM is known as the "Mother of Diseases" because it can cause various serious complications such as hypertension, stroke, kidney disorders, blindness, and even amputation. Many sufferers are unaware that they have DM, so they are at risk of complications if not properly managed (Detha et al., 2024). The prevalence of DM continues to increase globally, influenced by increasing age, obesity, and lack of physical activity. In 2023, the IDF recorded 536.6 million cases of DM worldwide (10.5%), and is estimated to increase to 783.2 million (12.2%) by 2045. Indonesia ranks sixth with 10.3 million sufferers. At the national level, the prevalence of DM increased from 8.5% (2017) to 10.9% (2024), with DKI Jakarta as the highest province (3.9%) and Central Java at 2.3%.

The highest number of people with Diabetes Mellitus (DM) is found in the 55-74 age group. In Sukoharjo Regency in 2024, 17,910 cases of DM were recorded, with Kartasura District having the highest number of cases, with 2,804 cases, including 678 new cases. DM control is crucial for preventing complications and improving patients' quality of life, which requires long-term adherence to medication. However, this adherence is challenging, especially for the elderly who experience

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declines in physical, psychological, and social function. According to Wibisono & Sutisna, (2023) in the National Agency for the Protection and Protection of Children, three main factors make the elderly a vulnerable group: loss of economic productivity, the emergence of various health problems, and dependence on others as companions or caregivers (Kartini et al., 2024).

Family involvement plays a crucial role in the successful medication of people with Diabetes Mellitus (DM), particularly as caregivers, which impacts the patient's psychosocial functioning and coping mechanisms. Lack of family support can reduce patient adherence with therapy (Farah Naz et al., 2019). This adherence includes behaviors such as following healthcare provider recommendations, such as maintaining a healthy diet, taking medication regularly, and conducting regular check-ups. Family support has been shown to be positively associated with patient adherence (Rahayu, 2024). Research by Pristianti et al., (2023) also confirms that family support is a key factor significantly influencing the well-being of older people with diabetes, making strengthening the family's role a crucial strategy in improving medication effectiveness.

In 2024, the Sukoharjo Regency Health Office recorded 15,927 cases of diabetes mellitus, with Kartasura District contributing the highest number, namely 2,126 cases (Aisyah et al., 2024). Preliminary data from the Kartasura Community Health Center (Puskesmas) also reported that of the 1,925 registered diabetes patients, many did not adhere to their regular check-ups, with one of the main contributing factors being a lack of family support. Based on these findings, researchers are interested in analyzing the relationship between family support and medication adherence in elderly people with diabetes, with the expectation that the results will strengthen understanding of the importance of the family's role in improving patient adherence and quality of life. However, despite the high prevalence of diabetes in Kartasura and the observed low adherence rates, few studies have specifically examined how family support influences medication adherence among elderly patients in this region. Most existing studies have focused on general populations or broader determinants of adherence, leaving a gap in localized, elderly-focused research. This study therefore provides novelty by offering context-specific evidence on the critical role of family support in promoting adherence, which can inform targeted interventions at the community health center level.

2. Research Methods

This study used a quantitative approach with a descriptive correlative design and cross-sectional method to analyze the relationship between family support and adherence to diabetes mellitus (DM) medication in the elderly. Data were collected at a single point in time at the Kartasura Community Health Center, the location with the highest number of DM patients in Sukoharjo Regency. The study was conducted in May–June 2025 with a population of 963 elderly DM patients undergoing outpatient medication. The sample size was determined using the Slovin formula:

$$n = \frac{N}{1 + N(e)^2}$$

where n = sample size, N = population size (963), and e = margin of error (0.1). Based on this calculation, the minimum sample size required was 91 respondents. Sampling was conducted using a simple random sampling technique with the following inclusion criteria: aged ≥60 years, undergoing medication for >2 months, living with family, able to read, write, and communicate, and willing to be respondents. Exclusion criteria included uncooperative patients. The independent variable in this study was family support, while the dependent variable was adherence to DM medication.

Table 1. Operational Definitions

Variable	Operational Definition	Instrument	Indicator
Family Support	A support system in the form of assistance in the form of attitudes, actions and acceptance from family members for the elderly, consisting of instrumental support, informational support, assessment support and emotional support according to respondents' perceptions.	Nursalam Questionnaire developed by (Maulinda, 2024)	-Informational support -Reward support -Instrumental support -Emotional support
Medication Adherence	The level of adherence of Diabetes Mellitus patients in undergoing medication according to the program they received	Modified Hill-Bone Questionnaire for Diabetes Mellitus Patients by (Dhistira, 2020)	-Adherence with routine check-ups -Adherence with the diabetes diet -Adherence with medication

The research instrument was a questionnaire consisting of three sections: respondent demographic data, family support, and medication adherence. The family support questionnaire was adapted from developed by Maulinda, (2024) containing 12 items with a 4-point Likert scale. Meanwhile, the medication adherence questionnaire was modified from the Hill-Bone Medication Adherence Scale, originally developed for hypertension, but adjusted for diabetes mellitus medication by rephrasing items to reflect DM therapy contexts such as oral medication, insulin injections, and routine check-ups. This modification has been applied in previous studies Dhistira, (2020) making the instrument suitable for measuring adherence in DM patients. Both instruments were tested for validity ($r > 0.4$) and reliability ($\alpha > 0.6$), thus considered feasible for use. The research procedure consisted of three stages: preparation (proposal writing and preliminary study), administration (research permit and ethical clearance), and implementation (informed consent and questionnaire completion by respondents). Ethical approval was obtained from the Health Research Ethics Committee of Universitas Muhammadiyah Surakarta with EC number EC/UMS/2025/05/0221, issued on May 12, 2025.

Data processing involved editing, coding, and tabulation before analysis with SPSS version 25.0. Univariate analysis was performed to describe data characteristics, while bivariate analysis used the Spearman rank correlation test to assess the relationship between family support and medication adherence at a significance level of $\alpha \leq 0.05$. The Spearman test was chosen because the data on family support and adherence were measured on an ordinal scale (Likert), and preliminary testing showed that the distribution did not meet the assumption of normality, making Spearman's correlation more appropriate than Pearson's correlation.

3. Results and Discussion

The Kartasura Community Health Center provides promotive, preventive, curative, and rehabilitative services, including outpatient care, general health checks, basic medical procedures, and BPJS referral services, supported by adequate health personnel and facilities. Based on the characteristics of 91 elderly respondents with diabetes at the Kartasura Community Health Center, the majority were aged 60-69 years (80.2%), female (61.6%), had a junior high school education (38.5%), self- employed (49.5%), married (83.5%), and had suffered from diabetes for 1-5 years (51.7%).

3.1. Univariate Analysis

3.1.1. Family Support

In this study, univariate analysis was conducted to determine the frequency distribution of family support variables and adherence to diabetes mellitus (DM) medication in the elderly.

Table 2. Frequency Distribution of Family Support at Kartasura Community Health Center

Independent Variable	Criteria	F	Percentage (%)
Family Support	Good (36-48 skor)	72	79.1
	Enough (27-35 skor)	16	17.6
	Not enough (≤26 skor)	3	3.3
Total		91	100

Table 2 shows that the majority of diabetes mellitus patients at the Kartasura Community Health Center (Puskesmas) received good support from their families, with 72 respondents (79.1%).

Table 3. Family Support Domain Distribution

Family Support Domain	Frequency	Percentage (%)
Informational Domain	3	3.3
Instrumental Domain	37	40.7
Emotional Domain and Self-Esteem	51	56
Total	91	100

Based on Table 3, it shows that the majority of respondents received family support from the emotional and self-esteem domains, namely 51 respondents (56%). This shows that the emotional and self-esteem domains have a big role in family support.

3.1.2. DM Medication Adherence in the Elderly

Table 4. Frequency Distribution of DM Medication Adherence in the Elderly at the Kartasura Community Health Center

Dependent Variable	Criteria	F	%
DM Medication Adherence in the Elderly	Obedient (14-35 skor)	88	96.7
	Not obey (36-56 skor)	3	3.3
Total		91	100

Based on Table 4, the majority of respondents (88 respondents) were compliant with their diabetes medication (96.7%).

3.2. Bivariate Analysis

The Relationship Between Family Support and Diabetes Medication Adherence in the Elderly. This study was conducted using the Spearman test to examine the relationship between family support and diabetes medication adherence among elderly people at the Kartasura Community Health Center.

Table 5. Relationship between family support and diabetes medication adherence among elderly people at the Kartasura Community Health Center.

Family Support	DM Medication Adherence				Total		p-value (Spearman)
	Obedient	%	Not obey	%	N	%	
Good	73	80. 2	0	0	73	80.2	0,001
Enough	14	15.3	1	1.1	15	16.5	
Not enough	1	1.1	2	2.2	3	3.3	
Total	88	96.7	3	3.3	91	100	

Scoring system for medication adherence: The modified Hill-Bone Medication Adherence Scale for DM consists of 14 items measured on a 4-point Likert scale (1 = never, 2 = sometimes, 3 = often, 4 = always), with total scores ranging from 14 to 56. Higher scores indicate better adherence. In this study, adherence was categorized as: Adherent (Obedient) = score ≥ mean value, and Non-adherent (Not obey) = score < mean value. The results showed that the majority of elderly who received good family support tended to be compliant in DM medication (80.2%), and none were non-compliant. A smaller proportion of those who received adequate support were compliant (15.3%), while respondents who received less support were more likely to be non-compliant. The Spearman statistical test produced a correlation coefficient of r = 0.452 with a p value = 0.001 ($\alpha \leq 0.05$), indicating a moderate positive correlation. Thus, it can be concluded that there is a significant relationship between family support and DM medication adherence in the elderly at Kartasura Community Health Center.

3.3.Discussion

3.3.1.Family Support

Research at the Kartasura Community Health Center (Puskesmas) showed that the majority of elderly people with diabetes received good family support (79.1%), particularly in the form of emotional support such as empathy, attention, and affection, which has been shown to improve their comfort, zest for life, and quality of health (Aisyah et al., 2024). This finding aligns with (Pamungkas et al., 2017) theory that strong family support creates better psychological and physical conditions for individuals with diabetes. Other studies by (Perdana et al., 2024) and Daniati, (2024) also emphasize the importance of the family's role in managing diabetes at home, including understanding nutrition, motivation, and proper caregiving. The family plays a key role in the medication process, strengthening patients' self-confidence, and helping them cope with the stress of chronic illness. This is supported by the emotional closeness between family members, which makes this support meaningful and has a direct impact on medication adherence in elderly people with diabetes.

3.3.2.Medication Adherence Level

Research results at the Kartasura Community Health Center indicate that the majority of elderly people with Diabetes Mellitus (DM) are compliant with their medication, with 96.7% of respondents following medical recommendations such as taking medication regularly, receiving regular check-ups, and maintaining a healthy lifestyle. This high level of adherence is supported by family support, adequate health information, and the active role of healthcare providers. These findings align with the theories of Wilson et al., (2024) and Green in (Rima, 2024) , which emphasize that adherence is influenced by factors such as knowledge, social support, and access to healthcare services. However, a small number of respondents still exhibited non-adherence, generally due to low understanding, motivation, and self-control in maintaining diet and medication. This situation indicates the need for ongoing education and support to prevent complications and ensure optimal medication outcomes.

3.3.3. The Relationship Between Family Support and DM Medication Adherence the Elderly

The results of this study indicate a significant relationship between family support and medication adherence to Diabetes Mellitus (DM) medication in the elderly at the Kartasura Community Health Center (p-value = 0.001 < α = 0.05). The majority of elderly who received good family support demonstrated high adherence to medication, such as medication consumption, regular check-ups, and a healthy lifestyle. This support acts as a reinforcing factor as explained by Green's theory, in addition to predisposing factors (knowledge, age, education) and motivating factors (access to services). However, a small number of elderly remained adherent even without family support, which is likely influenced by motivation and self-awareness. Conversely, some were non-adherent despite support, due to a lack of knowledge or negative psychological conditions. Effective family support includes providing care, education, dietary supervision, and emotional motivation, which have been shown to be important in the long-term management of diseases such as DM. These findings are reinforced by various other studies Tecklah et al., 2024) and Roheni, (2024) which also emphasize the importance of family involvement in encouraging adherence to DM medication to prevent complications and improve quality of life.

4. Conclusion

Based on the research results and discussion in the previous chapter on "The Relationship Between Family Support and Diabetes Medication Adherence in the Elderly at the Kartasura Community Health Center," the following conclusions can be drawn:

1. The majority of respondents in this study were aged 60-69 years, female, had a junior high school education, were self-employed, married, and had suffered from diabetes for 1-5 years.
2. The majority of elderly respondents with diabetes mellitus had good family support.
3. The majority of elderly respondents with diabetes mellitus were compliant with their medication.
4. There was a significant relationship between family support and diabetes medication adherence in the elderly at the Kartasura Community Health Center.

Practical and future research implications: These findings highlight the importance of family involvement in supporting elderly patients with diabetes to improve medication adherence and overall health outcomes. Future studies are recommended to explore other potential factors influencing adherence, such as health literacy, psychological well-being, and socioeconomic status, as well as to conduct longitudinal studies that can provide deeper insights into how family support evolves over time and its sustained impact on medication adherence.

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