Synthesis
GLOBAL HEALTH JOURNAL
SYNTIFIC Publisher
E-ISSN 2988-3970

Original Article

THE RELATIONSHIP BETWEEN KNOWLEDGE LEVEL AND MEDICATION ADHERENCE AMONG PATIENTS WITH TYPE II DIABETES MELLITUS

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Submitted: 26 October 2026, Review: 6 November 2026, Accepted: 13 November 2026.

ABSTRACT

Background. Type II diabetes mellitus (DM) is a chronic metabolic disease requiring long-term management and pharmacological therapy. Field observations indicate that some patients with type II DM do not take their medication regularly because they have a limited understanding of the disease and the importance of continuous treatment, placing them at risk of serious complications. This study aimed to analyze the relationship between knowledge level and medication adherence among patients with type II DM.
Research Method. This study used a quantitative correlational method with a cross-sectional approach and purposive random sampling. The population consisted of all patients with type II DM at the Siti Aisah Independent Nursing Practice in Peterongan, Jombang. The sample comprised 40 respondents who met the inclusion criteria. Data were collected using a questionnaire and analyzed using Spearman's rho test.
Findings. Univariate analysis showed that the largest group of respondents (17 people; 42.5%) had a "sufficient" level of knowledge, while half of the respondents (20 people; 50%) had a "moderate" level of medication adherence. Bivariate analysis using Spearman's rho yielded a significance value of 0.009 (<0.05) and a correlation coefficient of 0.408. These results indicate a statistically significant positive relationship of moderate strength between knowledge level and medication adherence.
Conclusion. These findings indicate a need for structured and integrated health education using visual media or leaflets, tailored to patients' educational levels. Optimizing the family's role as medication supervisors and providing counseling on managing multiple medications for improving medication adherence among patients with type II DM.

Keywords: Knowledge Level, Medication Adherence, Type II Diabetes Mellitus.

BACKGROUND

Type II Diabetes Mellitus (DM) is a chronic non-communicable disease that poses a global and national health challenge due to its continuously increasing prevalence and significant impact on quality of life and mortality [1]. This disease is characterized by glucose metabolic disorders resulting from insulin resistance and/or impaired insulin secretion. Type II DM accounts for approximately 85–95% of all adult diabetes cases, making it a primary concern in healthcare delivery, including at primary care levels such as community health centers [2].

Globally, the International Diabetes Federation[3] reported a diabetes prevalence of 10.5%, placing Indonesia sixth in the world with the highest number of patients. At the regional level, East Java consistently records a high disease burden, reaching over 850,000 cases [4]. Meanwhile, according to data from the Jombang District Health Office and the Central Statistics Agency (BPS) of Jombang Regency (2025), the most common health complaints among the public across 34 community health centers and healthcare facilities include acute respiratory infections (ARI), hypertension, tuberculosis, myalgia, pneumonia, diabetes mellitus, dengue fever, HIV, and influenza. At the Siti Aisah Clinic in Peterongan, Jombang, 27 patients were recorded with DM over the last 3 months. This high disease burden directly leads to an increase in patient visits at primary healthcare facilities, such as Puskesmas.

A critical aspect in managing Type II DM is patient adherence to therapy, particularly medication adherence. Adherence to treatment is a key factor in achieving optimal glycemic control and preventing long-term complications such as neuropathy, nephropathy, and cardiovascular disease[5]. Theoretically, patient adherence is strongly influenced by the level of knowledge regarding the disease and its therapeutic treatment. However, most previous studies on the relationship between DM knowledge and adherence still position knowledge as a single, basic cognitive variable (merely knowing the definition and symptoms of DM). In fact, amid today's rapid information openness, the main challenge for DM patients is no longer just a lack of information, but rather the widespread misinformation and prevalence of herbal or alternative treatment myths that shape misconceptions such as the belief that routine chemical medications damage the kidneys or that medication only needs to be taken when symptoms appear.

Low patient knowledge regarding diabetes often leads to misconceptions about the disease, such as assuming that medication is only necessary when symptoms arise or discontinuing medication once the condition improves. This issue is also observed at the primary care level, including at Dukuh Klopo Puskesmas in Peterongan, Jombang, where Type II DM patients still display variations in knowledge levels and medication adherence. If left unaddressed, this condition will increase the burden of disease, complications, and healthcare costs for both patients and the healthcare system [6]. The measurement of knowledge in this study does not merely focus on general understanding of the disease, but measures patients' specific knowledge regarding medication regimen adherence amid widespread perceptions of alternative treatment myths. Unlike the majority of prior studies that examined this relationship generally in urban populations, this study evaluates the

interaction between knowledge and adherence within the characteristics of a semi-rural community, which is influenced by family social capital and local beliefs in traditional medicine.

Furthermore, this study distinguishes itself by focusing on identifying which knowledge domain (whether dosage, side effects, or the impact of self-discontinuation) serves as the most significant trigger for patient non-adherence. The findings from mapping these specific domains provide an essential foundation for designing targeted and integrated nursing education strategies in primary care, moving beyond generic health instruction. Based on this urgency and novelty, this study was conducted to analyze the relationship between knowledge levels and medication adherence among Type II Diabetes Mellitus patients at Dukuh Klopo Puskesmas, Peterongan, Jombang.

RESEARCH METHODS

This study utilized a correlational analytical design with a cross-sectional approach. The population for this study consisted of all Type II Diabetes Mellitus patients at the Siti Aisah Independent Practice, totaling 40 respondents. The sampling technique employed was purposive sampling. The independent variable in this study was education level, while the dependent variable was medication adherence.The inclusion criteria for the sample were: 1) Type II DM patients undergoing treatment, 2) Patients actively taking oral antidiabetic agents and/or insulin for at least the past 3 months, 3) Patients who were conscious, capable of good communication, and able to read and understand the questionnaire.The research instrument utilized a standardized questionnaire, administered after respondents provided informed consent. Data were analyzed using the Spearman's rank correlation test (Spearman's rho) with a significance 0.05. This study received ethical approval on May 20, 2026, under certificate number 46-KEP-Unipdu/05/2026.

FINDINGS

Table 1 shows that most respondents were female (30; 75%). The largest age group was late older adulthood, 56–65 years (17; 42.5%). Most respondents had completed elementary school (29; 72.5%), and nearly half were homemakers (18; 45%). Most respondents had no family history of DM. Hypertension was the most common comorbidity (22; 55%). Regarding duration of illness, 14 respondents (35%) had had DM for 6–10 years.

1. Respondents' Demographic Characteristics

Table 1. Respondents' Characteristics Based on General Data

No.	Variable / Category	Frequency	Percentage (%)
1	Sex		
	Male	10	25.0
	Female	30	75.0
	Total	40	100
2	Age		
	Late adulthood (36–45 years)	5	12.5
	Early older adulthood (46–55 years)	15	37.5
	Late older adulthood (56–65 years)	17	42.5
	Older than 65 years	3	7.5
	Total	40	100
3	Education		
	Elementary school	29	72.5
	Junior high school	6	15.0
	Senior high school	3	7.5
	Higher education	2	5.0
	Total	40	100
4	Occupation		
	Not employed	7	17.5
	Homemaker	18	45.0
	Trader	7	17.5
	Private-sector employee	6	15.0
	Civil servant	2	5.0
	Total	40	100
5	Family history of DM		
	No family history of DM	23	57.5
	Family history of DM	17	42.5
	Total	40	100
6	Comorbidities		
	Kidney failure	3	7.5
	Diabetic ulcer	4	10.0
	Eye problems	9	22.5
	Itching	1	2.5
	Hypertension	22	55.0
	Cholesterol disorder	1	2.5
	Total	40	100
7	Duration of illness		
	>10 years	1	2.5
	6–10 years	14	35.0
	<5 years	25	62.5
	Total	40	100

Source: Primary data, 2026.

2. Knowledge Level

Table 2. Distribution of Respondents by Knowledge Level

Knowledge level	Frequency	Percentage (%)
Poor	11	27.5
Sufficient	17	42.5
Good	12	30.0
Total	40	100

Source: Primary data, 2026.

Table 2 above shows that nearly half of the respondents have a low level of knowledge 11 individuals (27.5%) while 17 individuals (42.5%) have a moderate level. Those with a good level of knowledge account for 12 individuals (30%), which also represents nearly half of the total number of respondents.

3. Medication Adherence

Table 3. Distribution of Respondents by Medication Adherence

Medication adherence level	Frequency	Percentage (%)
Low	15	37.5
Moderate	20	50.0
High	5	12.5
Total	40	100

Source: Primary data, 2026.

Table 3 above, half of the respondents 20 individuals (50%) fall into the category of having a moderate level of medication adherence. Meanwhile, a small proportion of the respondents 5 individual (5%) exhibit a high level of medication adherence.

4. Relationship Between Knowledge Level and Medication Adherence

Table 4. Relationship Between Knowledge Level and Medication Adherence

Knowledge level	Low adherence n (%)	Moderate adherence n (%)	High adherence n (%)	Total n (%)
Poor	8 (72.7)	3 (27.3)	0 (0.0)	11 (100)
Sufficient	4 (23.5)	11 (64.7)	2 (11.8)	17 (100)
Good	3 (25.0)	6 (50.0)	3 (25.0)	12 (100)
Total	15 (37.5)	20 (50.0)	5 (12.5)	40 (100)
		P Value = 0,009		

Source: Primary data, 2026.

The analysis showed a significance value of 0.009, which is below the error threshold ($\alpha = 0.05$), indicating a statistically significant correlation. There was a meaningful relationship between knowledge level and medication adherence, with a correlation coefficient of 0.408. The positive coefficient indicates that higher knowledge levels tend to be associated with better medication adherence, whereas lower knowledge levels tend to be associated with poorer adherence. The coefficient indicates a moderate relationship between the two variables.

DISCUSSIONS

1. Knowledge Level of Type II Diabetes Mellitus Patients at Nurse Siti Aisah's Independent Practice

Based on the research results, it was found that among the 40 Type II Diabetes Mellitus (DM) respondents at Nurse Siti Aisah's Independent Practice, nearly half

possessed a moderate level of knowledge, with the majority having an elementary school education background and falling within the early-to-late elderly age range.

Health knowledge serves as a primary domain shaping individual behavior in managing chronic diseases [7]. The knowledge of Type II DM patients encompasses an understanding of etiology, signs and symptoms, target blood glucose levels, dietary patterns, physical activity, and medication therapy regimens[8]. According to the Health Belief Model [6], individuals are inclined to take health actions if they possess adequate knowledge regarding their susceptibility to and the severity of their illness. Education level and age act as predisposing factors that influence information processing. Sufficient formal education facilitates the absorption of health information, whereas advanced age despite potential cognitive decline can be compensated for by life experience and repeated exposure to health education.

The results of this study align with and share similarities to the findings of [9], who reported that the majority of Type II DM patients exhibited a moderate knowledge level (68.1%). Similarly, research by [10] in primary healthcare facilities confirmed a matching pattern, where patient knowledge concentrated in the moderate category due to regular exposure to information during routine follow-ups. These similarities indicate that DM patients who actively visit primary healthcare facilities generally succeed in absorbing basic informatio-n regarding their condition.

However, an interesting difference (*divergence*) emerges when comparing these findings with the study by [11] conducted in a secondary referral facility (Hospital), which observed a dominance of patients with high knowledge levels (above 75%). This disparity is driven by demographic characteristics and the accessibility of educational media; patients in secondary referral facilities typically possess higher education levels and broader access to diverse visual/digital educational media. Conversely, in the present study location, despite the majority of respondents holding only a primary education background, their knowledge levels still managed to reach the moderate category. This suggests that limitations in formal education at the primary care level can be effectively compensated for by intensive and consistent interpersonal communication between nurses and patients during clinic visits.

The researcher posits that direct verbal education by healthcare providers at Nurse Siti Aisah's Independent Practice serves as an effective medium for maintaining patient understanding. Nevertheless, the remaining 27.5% of respondents with low knowledge

highlights the need for elderly-oriented educational strategy adjustments, such as using intuitive visual media (*leaflets/booklets*) to overcome memory limitations.

2. Medication Adherence Among Type II Diabetes Mellitus Patients at Nurse Siti Aisah's Independent Practice

The results demonstrated that half of the total respondents exhibited a moderate level of medication adherence, with only a small proportion demonstrating high adherence. The majority of respondents presented with comorbidities, primarily hypertension, and had been diagnosed with DM for less than 5 years. Medication adherence represents the degree to which a patient's behavior coincides with the prescribed regimen recommended by a healthcare provider [12]. As Type II DM treatment is lifelong, factors such as treatment fatigue, forgetfulness, reluctance to take medication when feeling asymptomatic, and polypharmacy due to comorbidities serve as primary barriers [13].

These findings share similarities with studies by [14], in which medication adherence among DM patients in primary healthcare settings was predominantly distributed across moderate-to-low ranges (accumulating to 87.5%). Both studies confirm that disease duration and treatment fatigue from routine medication intake are universal challenges among chronic disease patients.

On the other hand, a significant difference exists in the proportion of the high-adherence group. Research by [15] on DM patients in integrated primary care programs (such as Prolanis) recorded a high adherence rate of 45.2%, substantially higher than the 12.5% observed in this study. Comparative analysis indicates that this disparity stems from polypharmacy (pill burden) and structural support availability. In this study, 55% of respondents suffered from hypertensive comorbidities, requiring them to consume anti-hypertensive drugs alongside anti-diabetic medications. A heavy pill burden induces psychological apprehension regarding long-term renal damage from synthetic pharmaceuticals. Furthermore, the suboptimal establishment of family-based Medication Intake Supervisors (PMO) in an independent practice setting causes patients to take medication only upon experiencing overt physical symptoms (such as fatigue or dizziness).

3. Relationship Between Knowledge Level and Medication Adherence in Type II DM Patients

Statistical analysis revealed that the majority of respondents with low knowledge (72.7%) exhibited low medication adherence. Conversely, among respondents with good knowledge (12 individuals), none fell into the non-adherent category; the majority

demonstrated moderate (50%) to high (25%) adherence. Spearman's Rho correlation test yielded a statistically significant positive relationship with a moderate correlation strength.

According to Lawrence Green's Health Behavior Theory, knowledge serves as a fundamental predisposing factor shaping individual perception and behavior. Adequate knowledge regarding disease progression, long-term complication risks (such as diabetic ulcers, nephropathy, and retinopathy), and drug mechanisms fosters internal motivation for patients to maintain discipline in anti-diabetic therapy [16]. The findings of this study align with and reinforce the results of [17] [18] [19], which consistently demonstrated a significant association ($p<0.05$) between knowledge level and medication adherence, showing that patients with adequate knowledge are up to 3 times more likely to adhere to treatment.

However, this study displays different correlation dynamics when compared to an experimental study by [20]. In Susanto et al.'s study, high knowledge levels correlated very strongly with adherence, leading to near-perfect compliance. In contrast, the current study observed a moderate correlation strength. This difference reflects real-world community conditions (a non-interventional correlational study), where good knowledge does not automatically guarantee perfect adherence. Confounding variables—such as traditional medicine myths, financial constraints, and limited family support—can disrupt the translation of "knowledge" into "adherent behavior."

The researcher asserts that knowledge forms the essential foundation establishing patient awareness that anti-diabetic medication functions to control blood glucose rather than provide a permanent cure. Patients with inadequate knowledge tend to hold the misconception that medication is only needed when symptoms manifest. Therefore, knowledge reinforcement interventions both individual (tailored interactive counseling) and group-based (such as forming DM patient support groups) are crucial steps to convert health knowledge into sustained adherent behavior for optimal quality of life. The limitations of this study are this study did not fully control for other potential confounding variables that could influence adherence, such as socioeconomic/financial status, specific dimensions of family support, and the psychological impact of polypharmacy (pill burden) due to hypertensive comorbidities.

CONCLUSION

Based on the findings and discussion concerning the relationship between knowledge level and medication adherence among patients with type II diabetes mellitus at

Siti Aisah Independent Nursing Practice in Peterongan, Jombang, the following conclusions can be drawn; 1) Most patients with type II diabetes mellitus had a sufficient level of knowledge, while a smaller proportion had poor knowledge; 2) Most patients with type II diabetes mellitus had a moderate level of medication adherence, while only a small proportion had high adherence; 3) There was a statistically significant positive relationship between knowledge level and medication adherence among patients with type II diabetes mellitus at Siti Aisah Independent Nursing Practice. The higher the patients' knowledge level, the better their medication adherence tended to be and vice versa.

Acknowledgement. We would like to express our gratitude to the Dean of the Faculty of Health Sciences, UNIPDU Jombang, for supporting this research process from beginning to end. We would also like to thank the Head of the Siti Aisah Independent Nursing Practice for granting permission to conduct the research.

Conflict of Interest. The authors declare there is no conflict of interest.

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