The Relationship Between Age, Gender, Duration of Illness and Knowledge with Adherence of Diabetes Mellitus Patients

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Abstract. The adherence of patients to the five essential components of therapy is a critical factor in the successful management of diabetes mellitus (DM). This research aimed to investigate the extent to which factors such as age, gender, length of disease, and level of knowledge influence the degree to which persons with diabetes stick to their treatment regimens. The study was carried out utilizing a quantitative approach, and a cross-sectional design was included in the methodology. In this research, multiple linear regression was used, and each of the forty respondents was chosen with a specific purpose in mind. Age ($p < 0.005$), length of disease ($p <= 0.005$), and knowledge ($p = 0.005$) were shown to have a substantial effect on patient adherence to diabetes care, as indicated by the data. In contrast, there was no significant link between gender and adherence ($p > 0.005$) between the two variables. The following factors have a substantial impact on the degree to which patients adhere to the treatment of diabetes: their age, the length of time they have had the condition, and their level of understanding. The provision of technology-assisted assistance and the enhancement of educational opportunities are thus necessary in order to enhance the results of self-management for those who have diabetes.

Keywords: Age, Adherence, Diabetes Mellitus, Duration of Illness, Knowledge

1.Introduction

Diabetes Mellitus (DM) is a persistent health issue that significantly global public health in 2021, IDF reported 537 million diabetes cases worldwide, expected to increase to 634 million by 2030 [1]. Diabetes burden in Indonesia continued to rise, highlighting a significant public health issue individuals aged 15 years and older had increased to 10,9%, making it one of the most burdensome one-communicable diseases in the country[2]. Managing diabetes goes beyond pharmacological treatment and instead emphasizes sustainable behavioral change. The five pillars of Comprehensive diabetes care encompass education, nutritional management, exercise, medication, and blood glucose monitoring must be implemented consistently as a comprehensive approach. However, numerous studies have shown that compliance among people with diabetes regarding these five pillars remains low, contributing to a higher risk of complications [3].

Patient adherence is significantly influenced by multiple factors, including age, gender, and the period of illness, and knowledge about diabetes. Research by [4], found that age and knowledge have a significant association with diabetes self-management and adherence to

lifestyle modifications. Additionally, gender and disease duration were also reported to play roles, though the impact varies depending on local social and cultural contexts [5].

In the Kramatwatu Community Health Center, the number of diabetes cases is notably high. As of March 2025, there were 369 recorded cases, yet only 68 patients (around 18%) were actively participating in Prolanis activities—a relatively low proportion compared to the total number of cases. However, there is still limited local research in the Kramatwatu area that explores the relationship between sociodemographic characteristics, knowledge levels, motivation, family support, and the role of healthcare providers in relation to patients' adherence to Prolanis participation. This knowledge gap highlights the need for further studies to identify the underlying factors influencing patient engagement and to provide evidence-based recommendations for improving Prolanis participation.

Given this background, this study aims to analyze the Correlation of age, sex, duration of illness, and knowledge on the adherence of diabetes patients at Puskesmas Kramatwatu in 2025. The findings are expected to serve as a reference for developing more effective and targeted technology-based interventions in primary healthcare settings for diabetes management.

2 Methods

The research was carried out using a cross-sectional design within a quantitative framework, conducted at Kramatwatu Public Health Center (Puskesmas) in 2025. This study applied purposive sampling, a non-probability sampling technique in which participants are deliberately selected based on predetermined inclusion criteria. In this case, 40 individuals who had been diagnosed with Diabetes Mellitus (DM) were chosen as they met the research objectives. This technique ensures that the sample is relevant and provides rich information regarding the phenomena under study.

The demographic data form was used to collect factual characteristics such as age, gender, and duration of illness, which do not require validity and reliability testing. The structured questionnaire measuring knowledge was tested for validity using item-total correlation and for reliability using Cronbach's Alpha, with a coefficient of ≥0.70 considered acceptable. Similarly, the patient adherence questionnaire, which consisted of five domains (education, eating behavior, activity level, medication compliance, and glucose level tracking), was evaluated for content validity through expert review and statistical construct validity tests, while reliability was confirmed using Cronbach's Alpha to ensure internal consistency of the instrument.

Data Three analytical steps were employed: Descriptive analysis was utilized to outline the distribution of variables, and Chi-square analysis was employed to identify relationships between independent and dependent variables to explore associations, and logistic regression for multivariate analysis, to determine the influence of each variable on patient adherence

3 Results and Discussion

Table 1. Age Respondent Distribution (n= 40)

Age	Frequency	Percentage (%)
50-54	9	22.5
55-60	11	27.5
61-64	6	15.0
65-70	12	30
>70	2	5

Table 1 shows that the majority of respondents were in the age range of 65–70 years (30%). This is consistent with the 2018 Riskesdas data, which stated that the highest prevalence of diabetes was found in the age group of 55–64 years (6.3%), followed by the age group of 65–74 years (4.8%), however, this is not consistent with the data from the IDF, which stated that the highest prevalence of diabetes was in the 45–64 years age group. As age increases, there is a simultaneous decline in body function in the form of reduced pancreatic beta-cell function and increased insulin resistance, which makes older individuals more susceptible to experiencing glucose intolerance [3]

Table 2. Gender of Respondents (n=40)

Gender	Frequency	Percentage (%)
Male	17	42.5
Female	23	57.5

Table 2 shows that the majority of respondents were female (57.5%). This study is consistent with the 2018 Riskesdas data, which stated that the majority of diabetes patients are women, but it is not consistent with the IDF data, which reported that the majority of diabetes patients are men. Biologically [5] and [6], men are more prone to insulin resistance due to the distribution of visceral fat in the abdomen, while women at an older age experience menopause, which leads to a decrease in estrogen protection and thereby increases the risk of developing diabetes [7]

Table 3. Duration of Illness (n = 40)

Illness duration	Frequency	Percentage (%)
1-2 years	8	20
3-4 years	17	42.5
5-6	13	32.5
>7	2	5

Table 3 shows that the majority of respondents had an illness duration of 3–4 years. This is consistent with studies which reported [7] and [6] the average duration of diabetes is in the range of 3–4 years. This is due to the fact that the onset or symptoms experienced by patients usually appear only after 3–4 years of the disease being established. In addition, it is also caused by patients not recognizing the early symptoms of the disease, so that the initial diagnosis is generally made after they have unknowingly experienced symptoms for about 3–4 years

Table 4. Knowledge (n = 40)

Knowledge	Frequency	Percentage (%)
Low	1	2,5
Moderate	7	17,5
High	32	80
	40	100

Table 4 shows that the majority knowledge respondents majority with hight knowledge. This study is consistent with the research conducted by [8], which stated that the majority of diabetes patients have a high level of knowledge.

Table 5. Association Between Patient Age and Compliance with DM Management

Variable	r	p-value
Age Adherence	-0,112	0,274

Table 5 shows that age has no significant influence on the adherence of patients with Diabetes Mellitus. A study by [9] reported that older individuals with diabetes tend to have higher adherence to treatment compared to younger patients. This like research is supported by a review conducted by [10], which also concluded that elderly patients are generally more compliant with diabetes treatment than those who are relatively younger.

From a psychological perspective, older individuals tend to be more concerned about their health, as they are more likely to experience symptoms and complications associated with the disease. Moreover, since many elderly people are no longer working, they typically have more time to focus on their health condition. In contrast, younger patients are often still engaged in full-time work, feel physically strong, and may not perceive the urgency of managing their illness, leading to lower levels of adherence.

Table 6. The Correlation Gender and Adherence Among Diabetes Mellitus Patients

Variable	r	p-value
Gender Adherence	0.633	-0,10

Table 6 shows that age does not significantly affect patient adherence in the management of diabetes mellitus, with a p-value of 0.633. This finding aligns with the study conducted by [10], which reported no significant correlate between gender and medication adherence among diabetes patients. Similarly, a study by [11] found consistent results.

From a scientific standpoint, adherence is primarily influenced by psychological factors, whereas gender is a biological factor, and its influence tends to vary and is not consistently associated with adherence, whether in men or women. Both adherence and health-related behaviors are multifactorial, and gender does not appear to play a strong or direct role in determining these aspects [9].

Table 7. Association Between Illness Duration and Adherence to Diabetes Mellitus Management

Variable	r	p-value
Illness duration	0.245	0.032

Table 7 indicates that duration of illness has a significant influence on patient adherence, with a p-value of 0.004. Biologically, patients who have had diabetes for only 1–2 years may not yet experience or recognize the serious complications of the disease. However, as the duration reaches 3–4 years, patients often begin to feel the effects of the condition, which in turn motivates them to seek medical attention more frequently and utilize healthcare services more consistently [12].

This finding is consistent with the study by [7] titled "Type 2 Diabetes Mellitus: Challenges in Management in Indonesia", which states that patients typically begin

experiencing complications 3–5 years after diagnosis. As a result, they tend to visit healthcare facilities more often and show increased awareness and engagement in self-care practices.

Table 8. Knowledge as a Determining Factor in Adherence Among Diabetes Mellitus Patients

Variable	r	p-value
Illness duration	0.576	0.000

Table 8 demonstrates a significant relationship between The role of knowledge in influencing adherence to diabetes self-care practices, with a p-value of 0.000 and a correlation coefficient of 0.879. This is consistent with the findings of [13], who reported a strong Influence of knowledge on medication adherence among type 2 diabetes mellitus patients. Similarly, [8] found that patients with better knowledge tended to have greater adherence to treatment and self-care practices.

Knowledge plays a crucial role in shaping a positive attitude toward disease management. Well-informed patients are more aware of their condition, which enhances their adherence and also helps them make informed decisions regarding the use of alternative medicine and resist common misconceptions or myths related to diabetes. This perspective is supported by [10] in a study published in *Frontiers*, which emphasizes the impact of patient knowledge on behavior and treatment choices.

Table 9. Result Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.848	0.719	0.687	0.23666	1.316

The Model Summary results on table 9 shows an R value of 0.848, Showing a high degree of correlate between the dependent variable (adherence) and the independent variables—gender, age, duration of illness, and knowledge. The R Square value of 0.719 indicates that around 71.9% of the variability in adherence is accounted for by the four independent variables: gender, age, duration of illness, and knowledge. The remaining 28.1% is likely attributed to other factors not captured in the model.

Table 10. Result ANOVA Analysis

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.015	4	1.254	22.383	0.000
	Residual	1.960	35	0.056		
	Total	6.975	39			

Based on the ANOVA test results as shown in table 10, the F-value is 22.383 With a p-value of 0.000, the regression model is statistically significant, indicating that the independent variables jointly have a meaningful effect on the dependent variable effect in explaining the dependent variable, which is adherence among patients with diabetes mellitus.

Table 11. Results of Linear Regression Analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	**Std. Error**	**Beta**	**B**	**Std. Error**
1	(Constant)	0.015	0.253		0.061	0.952
	Age	0.134	0.054	0.476	3.260	0.002
	Illness Duration	-0.091	0.039	-0.052	-0.345	0.019
	Knowledge	0.373	0.108	0.480	3.912	0.000
	Gender	0.091	0.078	0.108	1.161	0.633

The results of the multiple linear regression analysis as shown in table 7, it explained about knowledge has the most dominant influence on patient adherence (B = 0.373; p = 0.000), followed by age (B = 0.134; p = 0.002) and duration of illness (B = 0.091; p = 0.019). In contrast, gender does not significantly affect adherence, as indicated by a p-value of 0.633.

These findings suggest that higher levels of knowledge, older age, and longer disease duration are associated with increased adherence among diabetes patients in implementing disease management. Among these factors, knowledge emerged as the most influential variable—each 1-point increase in knowledge score is associated with a 0.373-point increase in adherence. Likewise, for each additional year of age, adherence increases by 0.134 points, and for each additional year of having the disease, adherence increases by 0.091 points. Meanwhile, gender does not appear to be a predictor in this model.

5 Conclusion

A significant correlation exists between age, illness duration and knowledge and the adherence level of diabetes mellitus patients. Age, duration of illness and knowledge collectively influence adherence in implementing diabetes management in PKM Kramatwatu.

For Healthcare Services, Continuous education on treatment adherence should be strengthened, as it is a key supporting factor in managing diabetes mellitus effectively. For Institutions, this study can serve as a reference in designing strategies for the management and intervention programs for diabetes mellitus patients, and for future research, in the future studies should explore other factors that may influence adherence, such as family support.

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