



EVALUATIVE STUDY OF MEDICATION ADHERENCE IN PATIENTS WITH TYPE 2 DIABETES MELLITUS

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ABSTRACT

Medication adherence is a critical factor in the successful management of Type 2 Diabetes Mellitus (T2DM). Poor adherence may lead to uncontrolled blood glucose levels and increased risk of complications. This study aimed to analyze the level of medication adherence and its association with patient characteristics among T2DM patients at Lepo-Lepo Primary Health Center, Kendari City. This study used an analytical observational design with a cross-sectional approach. A total of 81 respondents were selected using purposive sampling. Medication adherence was assessed using the Morisky Medication Adherence Scale (MMAS-8), a widely validated and reliable instrument. The MMAS-8 has demonstrated good psychometric properties, with reported Cronbach's alpha values ranging from 0.61 to 0.83 across different populations, indicating acceptable internal consistency. In addition, previous validation studies have confirmed its construct validity and reliability in patients with chronic diseases, including Type 2 Diabetes Mellitus, making it appropriate for measuring medication adherence in this study. Data were analyzed descriptively. The majority of respondents were aged 50–60 years and had a duration of diabetes of less than 5 years. Most patients demonstrated low medication adherence (MMAS-8 score <6), while a smaller proportion showed moderate adherence (score 6–7), and no respondents achieved high adherence (score = 8). Common non-adherence behaviors included forgetting to take medication, stopping medication when feeling better, and inconsistent medication intake. Medication adherence among T2DM patients at Lepo-Lepo Primary Health Center remains suboptimal, with the majority classified as having low adherence.

Keywords: medication adherence; MMAS-8; patient characteristics; primary health care; type 2 diabetes mellitus

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INTRODUCTION

Diabetes Mellitus (DM) is one of the non-communicable diseases that has become a global public health concern, with its prevalence continuing to increase over time (International Diabetes Federation, 2021). This condition is characterized by impaired glucose metabolism due to insulin resistance and/or defects in insulin secretion, which in the long term may lead to serious complications such as neuropathy, nephropathy, retinopathy, and cardiovascular diseases (American Diabetes Association, 2023). Type 2 Diabetes Mellitus is the most common form and requires comprehensive long-term therapeutic management (World Health Organization, 2022).

The success of Type 2 Diabetes Mellitus treatment is highly dependent on patients' adherence to therapy, particularly in taking medications regularly according to healthcare providers' recommendations (World Health Organization, 2003). Poor medication adherence can result in inadequate glycemic control, increased risk of complications, and a decline in patients' quality of life (Jimmy & Jose, 2011). However, in clinical practice, medication adherence remains a major challenge in the management of chronic diseases (Shrivastava et al., 2013).

Various factors are known to influence patient adherence, including biological, psychological, and social aspects (World Health Organization, 2003). One of the commonly studied factors is patient characteristics, which include age, gender, level of education, and duration of illness. Age may influence both physiological conditions and health-related behaviors, while gender is associated with biological and social differences (Kautzky-Willer et al., 2016). Educational level is related to the ability to understand health information (health literacy) (Nutbeam, 2008), whereas the duration of illness may affect patients' experience as well as treatment fatigue in long-term therapy (Jimmy & Jose, 2011). Nevertheless, previous studies examining the relationship between patient characteristics and medication adherence have shown inconsistent results (Shrivastava et al., 2013). Therefore, further research is needed to explore this relationship, particularly at the primary healthcare level. Based on this background, this study aims to analyze the relationship between patient characteristics (age, gender, educational level, and duration of illness) and medication adherence among patients with Type 2 Diabetes Mellitus at Lepo-Lepo Primary Health Center, Kendari City.

METHOD

This study employed an analytical observational design with a cross-sectional approach, aimed at analyzing the relationship between patient characteristics and medication adherence among patients with Type 2 Diabetes Mellitus. A cross-sectional design allows for the assessment of variables at a single point in time to identify potential associations between independent and dependent variables (Setia, 2016). The study was conducted at Lepo-Lepo Primary Health Center, Kendari City. The study population consisted of all patients diagnosed with Type 2 Diabetes Mellitus who were undergoing treatment at the health center. A total of 81 respondents were included as the study sample, selected using a purposive sampling technique based on predefined inclusion and exclusion criteria. Purposive sampling is a non-probability sampling method in which subjects are selected based on specific characteristics relevant to the research objectives (Etikan et al., 2016). The inclusion criteria comprised patients diagnosed with Type 2 Diabetes Mellitus, currently undergoing treatment, willing to participate as respondents, and able to communicate effectively. Meanwhile, the exclusion criteria included patients who were unable to complete the questionnaire or had incomplete data.

Data collection was carried out using both primary and secondary data sources. Primary data were obtained through self-administered questionnaires completed by respondents to assess medication adherence was assessed using the Morisky Medication Adherence Scale (MMAS-8), a widely validated and reliable instrument. The validity of the instrument has been established through construct validation in previous studies, while its reliability has been demonstrated with Cronbach's alpha values ranging from 0.61 to 0.83, indicating acceptable internal consistency. In this study, data were analyzed descriptively to summarize patient characteristics and levels of medication adherence, including frequency distributions and percentages. Furthermore, inferential statistical analysis was conducted to examine the association between patient characteristics and medication adherence using appropriate statistical tests. All statistical analyses were performed using standard statistical software (Aguiar et al., 2020; Martinez-Perez et al., 2021; Oliveira et al., 2023)..

RESULT

A total of respondents from Lepo-Lepo Primary Health Center were included in this study. Based on descriptive analysis, the majority of respondents were within the age range of 50–60 years, indicating that most participants were in the older adult category. In terms of disease duration, most respondents had been diagnosed with Type 2 Diabetes Mellitus for less than 5 years. Medication adherence was assessed using the Morisky Medication Adherence Scale (MMAS-8), a validated instrument widely used to measure adherence behavior in patients with chronic diseases (Morisky et al., 2008). The total adherence scores among respondents ranged from low to moderate categories.

The findings revealed that the majority of respondents had low levels of medication adherence, as indicated by total MMAS-8 scores of less than 6. Meanwhile, a smaller proportion of respondents fell into the moderate adherence category (scores 6–7), and no respondents were classified as having high adherence (score 8). These results indicate that optimal adherence has not yet been achieved among patients with Type 2 Diabetes Mellitus in this setting. Analysis of individual MMAS-8 items (P1–P8) showed that non-adherence behaviors, such as forgetting to take medication, discontinuing medication when feeling better, and inconsistency in medication intake, were still frequently reported by respondents. This pattern suggests that behavioral factors remain a significant barrier to achieving optimal medication adherence. Overall, the results demonstrate that medication adherence among patients with Type 2 Diabetes Mellitus at Lepo-Lepo Primary Health Center remains suboptimal, with the majority of patients categorized as having low adherence. This finding highlights the need for targeted interventions to improve adherence behavior and support better disease management outcomes (World Health Organization, 2003).

Table 1.
The need for targeted interventions to improve adherence behavior and support better disease management outcomes

Location	Age	Occupation Type	Education Level	Employment Status	Duration of Diabetes	P1	P2	P3	P4	P5	P6	P7	P8	Score
2	60	1	1	1	1	0	1	0	1	1	0	1	0.5	4.5
2	57	2	4	2	1	1	0	1	1	1	1	0	0.5	5.5
2	60	2	1	1	1	1	1	0	1	1	0	0	0.5	4.5
2	59	2	1	1	1	1	0	0	1	0	0	1	0.5	3.5
2	60	2	3	1	1	1	0	0	1	0	0	0	0.5	2.5
2	59	2	1	1	1	1	0	0	1	1	1	0	0.5	4.5
2	60	1	1	1	1	0	0	0	1	1	0	0	0.5	2.5
2	58	2	1	1	1	1	0	0	1	1	0	0	0.5	3.5
2	57	1	3	1	1	0	0	0	1	1	1	0	0.5	3.5
2	60	1	5	3	1	0	0	0	0	1	1	0	0.5	2.5
2	60	2	1	1	1	0	0	0	1	0	1	0	0.5	2.5
2	56	2	4	2	1	0	0	0	0	1	1	0	0.5	2.5
2	55	2	4	2	1	0	0	1	0	1	0	1	0.5	3.5
2	60	1	1	1	1	1	0	1	0	1	1	0	0.5	4.5
2	56	2	1	1	1	0	0	0	1	1	0	0	1	3
2	59	1	1	2	1	0	1	0	1	1	1	0	0.5	4.5
2	60	1	1	1	1	0	1	0	1	1	0	1	0.75	4.75
2	50	1	4	4	1	1	0	0	0	1	0	0	0.75	2.75
2	52	2	4	4	1	1	0	0	0	0	0	0	0.75	1.75
2	55	1	4	4	1	0	0	0	0	0	0	0	0.75	0.75
2	52	1	1	2	1	1	1	1	0	0	1	0	0.5	4.5
2	53	1	1	2	1	1	0	1	1	1	1	0	0.5	5.5
2	55	2	1	3	1	1	1	0	1	0	0	0	0.75	3.75
2	57	2	1	1	1	1	0	1	0	0	0	0	0.5	2.5
2	56	2	1	1	1	0	0	0	0	0	0	0	1	1
2	56	2	1	1	1	1	0	1	0	1	1	0	0.5	4.5
2	55	2	1	2	1	0	0	0	0	1	0	0	1	2
2	58	2	1	1	1	0	0	0	1	1	0	0	1	3
2	60	1	4	1	1	1	1	1	0	0	1	0	0.75	4.75
2	60	2	1	1	1	0	0	1	0	1	0	0	1	3
2	55	1	1	2	1	0	1	1	1	1	0	0	0.5	4.5
2	54	2	1	2	1	1	1	1	1	0	1	0	0.5	5.5
2	52	2	1	2	1	1	1	0	1	1	1	0	0.5	5.5
2	54	1	3	2	1	1	0	1	1	1	1	0	1	6
2	59	1	3	1	1	1	0	1	1	1	1	0	1	6
2	58	2	3	1	1	0	0	0	1	0	0	0	1	2
2	56	1	1	2	1	1	1	1	1	1	1	0	0.25	6.25
2	60	2	5	1	1	1	1	0	1	1	1	0	1	6
2	60	2	4	1	1	0	0	0	0	1	0	0	0.5	1.5
2	60	2	1	1	1	1	1	0	0	1	0	0	0.5	3.5
2	42	2	1	1	1	1	1	1	0	0	1	1	0.5	5.5
2	58	2	5	1	1	0	0	0	0	0	0	0	1	1
2	56	2	5	1	1	0	0	1	0	1	1	1	0.75	4.75

Location	Age	Occupation Type	Education Level	Employment Status	Duration of Diabetes	P1	P2	P3	P4	P5	P6	P7	P8	Score
2	56	1	1	2	1	1	1	1	1	0	1	1	0.75	6.75
2	45	1	1	2	1	0	0	1	0	1	1	0	0.5	3.5
2	55	1	1	1	1	1	1	1	1	1	1	0	0.5	6.5
2	55	2	1	1	1	0	0	0	0	1	0	1	1	3
2	52	1	1	3	1	0	0	0	1	1	0	0	0.5	2.5
2	52	2	1	5	1	0	0	0	0	1	0	0	0.5	1.5
2	50	2	3	5	1	0	0	0	1	1	0	0	0.5	2.5
2	60	2	5	1	1	0	1	0	1	1	1	1	1	6
2	58	1	4	2	1	1	0	0	0	1	0	0	0.5	2.5
2	51	2	1	5	1	0	0	0	0	0	0	0	0.5	0.5
2	60	2	4	1	1	1	1	0	1	0	0	0	0.5	3.5
2	60	2	1	3	1	1	1	0	1	1	1	0	0.5	5.5
2	59	2	3	1	1	0	0	0	0	1	0	0	0.5	1.5
2	40	1	1	2	1	0	1	1	1	0	1	0	0.5	4.5
2	55	1	4	4	1	1	1	1	1	0	1	0	0.5	5.5
2	59	2	1	1	1	0	0	0	0	1	1	0	1	3
2	59	1	1	3	1	0	0	0	1	1	0	0	0.5	2.5
2	40	2	4	4	1	1	0	1	1	1	1	1	0.5	6.5
2	55	2	4	2	1	0	0	0	0	1	0	0	0.5	1.5
2	42	2	1	5	1	0	0	0	1	1	0	0	0.5	2.5
2	60	1	1	2	1	1	1	1	1	0	1	1	0.5	6.5
2	40	1	1	2	1	1	1	1	0	0	1	0	0.75	4.75
2	37	2	1	5	1	0	0	0	0	1	0	0	0.5	1.5
2	55	2	1	5	1	0	0	1	0	0	0	1	5	7
2	54	1	1	1	1	0	0	0	1	1	0	0	0.5	2.5
2	60	2	1	5	1	0	0	0	0	1	0	0	1	2
2	60	1	5	1	1	0	0	0	1	1	0	0	0.5	2.5
2	55	2	4	4	1	0	0	1	0	1	1	0	0.5	3.5
2	58	1	1	1	1	0	0	0	1	1	0	0	0.5	2.5
2	55	1	4	4	1	0	0	1	1	1	1	0	0.5	4.5
2	46	2	1	5	1	1	1	1	0	0	1	0	0.75	4.75
2	43	2	1	5	1	1	0	0	0	0	0	0	0.75	1.75
2	57	1	3	1	1	0	0	0	0	0	0	0	0.5	0.5
2	56	1	3	1	1	1	0	1	1	1	1	0	0.5	5.5
2	60	2	1	1	1	0	1	1	1	0	1	1	0.5	5.5
2	58	1	1	2	1	1	1	1	1	1	1	0	0.25	6.25
2	59	2	4	1	1	0	0	1	0	1	0	0	0.5	2.5
2	59	1	2	1	1	0	0	1	1	1	0	0	0.5	3.5

DISCUSSION

The findings of this study demonstrate that medication adherence among patients with Type 2 Diabetes Mellitus (T2DM) at Lepo-Lepo Primary Health Center is predominantly low, as indicated by MMAS-8 scores below 6 in the majority of respondents. No respondents were classified as having high adherence. This result underscores a critical issue in diabetes management, as adherence is a fundamental determinant of therapeutic success and long-term glycemic control (World Health Organization, 2003; Jimmy & Jose, 2011). The majority of respondents in this study were aged between 50–60 years, which is consistent with the epidemiological pattern of T2DM, where prevalence increases with age due to progressive insulin resistance and pancreatic β -cell dysfunction (American Diabetes Association, 2023). However, despite being in an age group at higher risk for complications, adherence levels remained low. This finding suggests that older age does not necessarily translate into better adherence behavior. Previous studies have also reported inconsistent associations between age and adherence, indicating that behavioral and psychosocial factors may play a more significant role than age alone (Shrivastava et al., 2013).

Regarding the duration of illness, most respondents had been diagnosed with diabetes for less than 5 years. Interestingly, low adherence was still dominant in this group. This finding may reflect insufficient patient awareness and adaptation to long-term therapy in the early stages of the disease. Patients who are newly diagnosed may not yet fully understand the chronic nature of diabetes and

the necessity of lifelong medication adherence (Jimmy & Jose, 2011). On the other hand, studies have also shown that longer disease duration can lead to treatment fatigue, which may reduce adherence over time (Shrivastava et al., 2013). Therefore, both early-stage and long-term patients are vulnerable to non-adherence, albeit due to different underlying reasons. Analysis of individual MMAS-8 items revealed that common non-adherence behaviors included forgetting to take medication, discontinuing medication when feeling better, and inconsistent medication intake. These findings indicate the presence of both unintentional and intentional non-adherence. Forgetfulness is a form of unintentional non-adherence often associated with busy daily activities or lack of structured routines. Meanwhile, stopping medication when symptoms improve represents intentional non-adherence, which is frequently linked to poor understanding of the disease and its treatment (Morisky et al., 2008; World Health Organization, 2003). This behavior is particularly concerning in chronic diseases such as diabetes, where symptoms may not always be present despite ongoing pathological processes.

Educational level is another important factor that may influence medication adherence. Patients with lower educational backgrounds may have limited health literacy, which can affect their ability to comprehend medical instructions and the importance of adherence (Nutbeam, 2008). Although this study primarily used descriptive analysis and did not statistically test the association between education level and adherence, previous research has shown that higher education is often associated with better adherence due to improved understanding of disease management (Shrivastava et al., 2013). Overall, the results of this study are in line with previous findings that medication adherence in chronic diseases remains a global challenge. The World Health Organization (2003) emphasizes that adherence is influenced by multiple dimensions, including patient-related factors, therapy-related factors, healthcare system factors, and socioeconomic conditions. Therefore, improving adherence requires a multifaceted approach. Interventions such as patient education, counseling, simplification of drug regimens, and the use of reminder systems have been shown to improve adherence outcomes (Jimmy & Jose, 2011). In the context of primary healthcare, the role of healthcare providers is crucial in promoting adherence. Effective communication, patient-centered care, and continuous monitoring can enhance patients' understanding and motivation to adhere to therapy. Given the low adherence levels observed in this study, it is essential to implement targeted strategies at the primary healthcare level to support patients in managing their condition more effectively.

CONCLUSION

This study demonstrates that medication adherence among patients with Type 2 Diabetes Mellitus at Lepo-Lepo Primary Health Center is predominantly low, with no patients achieving high adherence levels. The most common barriers to adherence include forgetfulness, discontinuation of medication when symptoms improve, and inconsistent medication-taking behavior. Patient characteristics such as age and duration of illness show descriptive patterns but do not necessarily ensure better adherence. These findings indicate that medication adherence is influenced more by behavioral and cognitive factors rather than demographic characteristics alone.

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