Jurnal Keperawatan
Volume 11, Issue 1, Halaman 278-284
e-ISSN: 2354-6050

https://ejurnal.poltekkesjakarta3.ac.id/index.php/JKep
DOI: https://doi.org/10.32668/jkep.v11i1.2351

MEDICATION ADHERENCE AND STRESS LEVELS IN RELATION TO QUALITY OF LIFE AMONG PATIENTS WITH TYPE 2 DIABETES MELLITUS

1st Putri Cahyaningrum

2nd Rif'atul Fani

3rd Mokhtar Jamil

[1] Undergraduate Nursing Study Program, Faculty of Nursing, Institute of Technology, Science, & Health, Dr. Soepraoen Hospital, Kesdam V Brawijaya Malang, Indonesia

*email: *rifatul@itsk-soepraoen.ac.id*

Keywords:
Diabetes Mellitus Type 2
Medication adherence
Quality of life
Stress level

Abstract

Type 2 diabetes mellitus (T2DM) is a chronic disease that may affect physical, psychological, and social well-being, thereby influencing patients' quality of life. This study aimed to analyze the relationship between medication adherence and stress levels with quality of life among patients with T2DM in primary healthcare. A quantitative analytical observational study with a cross-sectional approach was conducted among 83 patients with T2DM selected using purposive sampling. Medication adherence was measured using the Morisky Medication Adherence Scale (MMAS-8), stress levels using the Perceived Stress Scale (PSS-10), and quality of life using the Diabetes Quality of Life–Brief Clinical Inventory (DQoL-BCI). Data were analyzed using Chi-square tests with a significance level of $p \leq 0.05$. Most respondents demonstrated high medication adherence (47.0%), low stress levels (47.0%), and high quality of life (48.2%). There was a significant relationship between medication adherence and quality of life ($p = 0.005$). Respondents with higher medication adherence tended to report better quality of life. Stress level was also significantly associated with quality of life ($p = 0.032$), where higher stress levels were associated with poorer quality of life. Medication adherence and stress levels were significantly associated with quality of life among patients with T2DM. These findings highlight the importance of integrating adherence support and psychosocial management into diabetes care in primary healthcare settings.

Received: December 2025
Accepted: February 2026
Published: May 2026

© year The Authors. Published by Published Jurusan Keperawatan, Politeknik Kesehatan Kemenkes Jakarta III. This is Open Access article under the CC-BY-SA License (http://creativecommons.org/licenses/by-sa/4.0/). DOI: https://doi.org/10.32668/jkep.v11i1.2351

INTRODUCTION

Type 2 diabetes mellitus (T2DM) is a chronic disease with far-reaching consequences, not only for health but also for social and economic dimensions, as well as for the sustainability of the healthcare system.

Conceptually, diabetes mellitus is understood as a metabolic disorder characterized by persistent hyperglycemia due to abnormalities in insulin secretion, insulin action, or a combination of both. This disease is progressive and long-term, potentially triggering microvascular and macrovascular complications that impact the physical, psychological, and social functioning of sufferers (1).

Globally the reports that the number of people with diabetes has nearly quadrupled in the past three decades, with more than 90% of cases classified as type 2 diabetes mellitus. This trend places diabetes as one of the fastest-growing non-communicable diseases and poses a serious challenge to global health systems in their efforts to reduce long-term complications and maintain patients' quality of life (2).

At the national level, diabetes mellitus has become an increasingly complex public health issue. The International Diabetes Federation lists Indonesia as one of the countries with the highest number of diabetes sufferers in the world, with a significant proportion of undiagnosed cases remaining (3).

In recent years, the management of type 2 diabetes mellitus has increasingly shifted from a solely biomedical orientation toward a more patient-centered and behavior-based approach. One of the current trend issues in diabetes care is the persistent problem of medication non-adherence, despite the wider availability of antidiabetic therapy and primary healthcare services. The increasing complexity of long-term medication regimens, fear of side effects, treatment fatigue, and low self-management capacity remain important barriers that may compromise treatment outcomes. At the same time, psychological distress and perceived stress have become increasingly recognized as major concerns among patients with chronic metabolic diseases, including T2DM, because they may interfere with self-care behavior, glycemic control, and overall well-being (5).

In the post-pandemic and chronic care era, stress-related problems among patients with diabetes have gained greater attention due to their potential influence on treatment engagement, motivation, and health-related quality of life. Therefore, current diabetes management is no longer limited to blood glucose control alone, but also includes behavioral adherence and psychosocial adaptation as essential components of successful care. This trend highlights the need for empirical studies that examine medication adherence and stress simultaneously in relation to patient quality of life, particularly in the context of primary healthcare services.

T2DM management requires an integrated, long-term approach through pharmacological and non-pharmacological therapies to achieve optimal glycemic control. In this context, medication adherence is a key determinant of therapy success because it plays a crucial role in preventing complications, slowing disease progression, and maintaining the patient's quality of life. Conversely, non-adherence to medication regimens can lead to suboptimal glycemic control, an increased risk of complications, and an increased clinical and economic burden, both on the individual and the healthcaresystem(4).

In addition to adherence to therapy, psychological factors, particularly stress, also play a significant role in the course of diabetes mellitus. Chronic stress can disrupt hormonal balance, increase blood glucose levels, and decrease patient motivation to consistently adhere to treatment. These impacts not only worsen glycemic control but also hinder individuals' adaptation to their chronic disease (5). Therefore, optimal medication adherence, coupled with effective stress management, is crucial for improving the quality of life of diabetes mellitus patients. Quality of life is considered an important indicator of successful chronic disease management because it reflects an individual's comprehensive perception of their health, encompassing physical, psychological, social, and environmental aspects(6).

Several empirical studies published between 2020 and 2025 have demonstrated a significant association between medication adherence, psychological factors, and quality of life in patients with type 2 diabetes mellitus (T2DM). (7) reported that better medication adherence was positively associated with health-related quality of life, particularly in the physical and mental domains. Similar results were found by (8) in India, indicating that patients with low adherence tended to have a poorer quality of life. A study (9) in China expanded the psychosocial perspective by demonstrating that disease stigma simultaneously impacts medication adherence and quality of life. Furthermore (10) emphasized that disease acceptance is a crucial determinant of adherence behavior, while (11) revealed, using a structural equation modeling approach, that medication adherence is influenced by individual factors and the healthcare system, which indirectly impact quality of life.

Other studies have also confirmed the contribution of psychological factors in determining the quality of life of T2DM patients. Studies (12) and (13) report that high

stress levels are associated with decreased quality of life and worsened disease management. Findings (14) indicate that longer disease duration, suboptimal glycemic control, and low psychological well-being are associated with a more significant decline in quality of life. Furthermore (15) found that patients who adhere to therapy have a better quality of life compared to non-adherent patients, while (16) confirmed that stress contributes to decreased quality of life through its impact on physical health, emotional well-being, and the ability to carry out daily activities.

However, most previous studies have examined medication adherence, psychological stress, and quality of life separately or only partially. Limited studies have simultaneously analyzed both behavioral and psychosocial determinants of quality of life in a single analytical model, especially among patients receiving routine care in Indonesian primary healthcare settings. In addition, contextual differences in patient characteristics, family support, access to treatment, and healthcare delivery systems may produce different findings across populations. Therefore, a context-specific study is needed to provide more relevant evidence for strengthening comprehensive diabetes care at the primary healthcare level. Based on this research gap, this study focuses on three main variables: medication adherence, stress levels, and quality of life in patients with type 2 diabetes mellitus. Medication adherence is defined as the degree to which a patient's behavior in taking antidiabetic medications conforms to the prescribed regimen. Stress levels refer to an individual's psychological response to the demands of a chronic disease and its management process, while quality of life is understood as an individual's perception of their physical, psychological, social, and environmental health. The interrelationships between these variables are explained through the Health Belief Model framework, which emphasizes that health behaviors, including medication adherence, are influenced by individual perceptions of disease threat, benefits, and barriers to therapy, and psychological factors, which in turn impact health outcomes and quality of life. This framework serves as a conceptual foundation for empirically examining the relationship between medication adherence, stress levels, and quality of life in patients with type 2 diabetes mellitus.

METHOD

This study employed a quantitative observational-analytical design with a cross-sectional approach. The cross-sectional approach was chosen based on the research objective, which was to examine the relationship between medication adherence and stress levels with quality of life in patients with type 2 diabetes mellitus. This design allows for simultaneous analysis of the relationships between variables without any specific treatment or intervention from the researcher, thus representing the empirical conditions of respondents over a single time period. The survey method was used because data collection was conducted directly from respondents using a structured questionnaire as the research instrument.

Population and Sample

The study population included all adult (18–59 years old) and elderly (>60 years old) type 2 diabetes mellitus patients actively undergoing treatment at a community health center (Puskesmas) serving as a primary healthcare facility. Based on service data from January to May 2025, the population meeting these criteria was 472. Purposive sampling was selected because this study required respondents with specific clinical and treatment-related characteristics that were directly relevant to the research objectives, namely patients diagnosed with type 2 diabetes mellitus, currently receiving antidiabetic therapy, and able to provide information regarding medication adherence, perceived stress, and quality of life. This technique was considered appropriate to ensure that the selected respondents met the analytical needs of the study and were able to

represent the targeted phenomenon within the primary healthcare context.

To minimize selection and information bias, several control measures were applied during the data collection process. First, respondent recruitment was conducted using clearly defined inclusion and exclusion criteria. Second, the same structured questionnaire and standardized data collection procedures were applied to all participants. Third, the researcher provided uniform explanations before questionnaire completion to reduce differences in interpretation. Fourth, respondents were recruited during routine service visits to reduce overrepresentation of specific patient subgroups. These procedures were intended to improve data consistency and reduce the potential for systematic bias in sample selection and response recording.

Purposive sampling was selected because this study specifically targeted respondents who met particular clinical and treatment-related characteristics relevant to the research objectives. This approach enabled the researcher to recruit participants diagnosed with type 2 diabetes mellitus who were actively receiving therapy and capable of completing the research instruments. Although Slovin's formula was used to estimate the minimum required sample size, respondent selection remained based on predefined inclusion criteria to ensure data relevance and adequacy for the analytical objectives of the study.

The sample size was determined using the Slovin formula with a 10% margin of error. The calculation yielded a sample size of 82.51, which was then rounded up to 83 respondents. This number was deemed sufficiently representative of the population characteristics and sufficient to meet the needs of the planned statistical analysis.

Data Collection Techniques and Instruments

Data collection was conducted using primary data obtained through respondents completing a structured questionnaire. The research instrument was structured according to the variables studied and divided into three main components.

Medication adherence was measured using the 8-item Morisky Medication Adherence Scale (MMAS-8). This instrument evaluates the patient's level of adherence to antidiabetic medications, including aspects such as forgetting to take medication, discontinuing medication without consulting a healthcare professional, and consistency in following the therapy regimen. The total score ranges from 0 to 8 and is further classified into high, moderate, and low adherence categories. Medication adherence categories were determined based on MMAS-8 scoring guidelines, namely high adherence (score = 8), moderate adherence (score 6 to <8), and low adherence (score <6).

Stress levels were measured using the 10-item Perceived Stress Scale (PSS-10). Stress level categorization for the PSS-10 instrument consisted of low stress (0–13), moderate stress (14–26), and high stress (27–40).This instrument assesses an individual's perception of stress experienced in daily life, including feelings of unpredictability, loss of control, and excessive pressure. The scale used is a five-point Likert scale with a total score ranging from 0 to 40, which is then categorized into mild, moderate, and severe stress levels. Patient quality of life was measured using the Diabetes Quality of Life – Brief Clinical Inventory (DQoL-BCI), which consists of 15 questions. This instrument assesses the quality of life of diabetes patients based on three main domains: life satisfaction, disease impact, and health concerns. The total score ranges from 15 to 75 and is classified as low, moderate, or high quality of life.

Instrument Validity and Reliability Test

The instrument used in this study is a standard measurement tool that has undergone adaptation and prior testing in the Indonesian population. Validity was assessed through construct validity and item-total correlation. The MMAS-8, the Indonesian version of the PSS-10, and the DQoL-BCI have been reported to have

item correlation values that meet validity criteria with an acceptable level of statistical significance.

Reliability testing was conducted using Cronbach's Alpha to assess the internal consistency of the instruments. In previous validation studies, the Indonesian versions of MMAS-8, PSS-10, and DQoL-BCI demonstrated acceptable reliability values above the recommended threshold of 0.70. In the present study, all instruments were administered in their standardized form to maintain consistency in measurement procedures across respondents. The results showed that the MMAS-8 had a Cronbach's alpha value of 0.76, the PSS-10 had a Cronbach's alpha value of 0.82, and the DQoL-BCI had a Cronbach's alpha value of 0.88. Since all coefficients were within the acceptable reliability range, the instruments were considered sufficiently reliable for use in this study.

Data Processing and Analysis Techniques

The data obtained were first edited to ensure the completeness and consistency of respondents' responses. Next, coding was performed by assigning a numerical code to each variable category. The data were then scored according to the guidelines for each instrument and presented in a distribution tabulation. Quality of life categories were determined based on the total DQoL-BCI score distribution, where higher scores indicated better perceived quality of life.

The data analysis process was carried out in two stages. Univariate analysis was used to describe the characteristics of the respondents and the distribution of each research variable in the form of frequencies and percentages. This analysis was also used to determine the average age of the respondents and the duration of type 2 diabetes mellitus. Next, bivariate analysis was conducted to examine the relationship between the independent variables, namely medication adherence and stress levels, and the dependent variable, quality of life. The Chi-square test was considered appropriate because all research variables were categorized into ordinal or nominal groups, allowing the analysis of associations between independent and dependent categorical variables. The statistical test used was the Chi-Square test, with a significance level set at a p-value ≤ 0.05. A p-value ≤ 0.05 indicates a statistically significant relationship, while a p-value > 0.05 indicates no significant relationship. All data analyses were conducted using computer statistical software.

Research Ethics

This research was conducted in accordance with the principles of research ethics. Each respondent was given a clear explanation of the objectives, procedures, and benefits of the study before the data collection process was carried out. Respondent participation was voluntary and was proven by signing an informed consent form. This study has obtained ethical approval from the Health Research Ethics Committee of ITSK Dr. Soepraoen, Kesdam V/Brawijaya Malang, with ethics letter number KEPK-EC / 407 / XII / 2025. The entire research process was carried out in accordance with the principles of health research ethics and the principle of fairness for all participants.

RESULTS AND DISCUSSION

Table 1. Respondent characteristics

Characteristics	Frequency (n)	Percentage (%)
Age		
Adult (18–59 years)	48	32.2%
Elderly (>60 years)	35	23.5%
Total	83	100.0%
Gender		
Male	23	15.4%
Female	60	80.3%
Total	83	100.0%
Last Education		
No School	3	2.0%
Elementary School	29	19.5%
Junior High School	16	10.7%
Senior High School	25	16.8%
Bachelor's Degree	10	6.7%
Total	83	100.0%
Marital Status		
Single	2	1.3%
Married	58	38.9%
Widow/Widower	23	15.4%
Total	83	100.0%
Occupation		
Unemployed	19	12.8%
Housewife	34	22.8%
Civil Servant	2	1.3%

Private Employee	7	4.7%
Entrepreneur	18	12.1%
Odd Jobs	3	2.0%
Total	83	100.0%
Duration of DM		
<5 years	28	38.9%
5–10 years	20	13.4%
>10 years	5	3.4%
Total	83	100.0%
Type of Therapy		
Oral Medication	70	47.0%
Insulin	4	2.7%
Combination	1	0.7%
Herbal Medicine	3	2.0%
Total	83	100.0%
Living With		
Alone	8	5.4%
Spouse	53	35.6%
Children	21	14.1%
Other Family	1	0.7%
Total	83	100.0%
Source of Medical Costs		
Personal	2	1.3%
BPJS	76	51.0%
Other Insurance	5	3.4%
Total	83	100.0%

Based on Table 1, the majority of respondents were in the adult age group (18–59 years), with 48 respondents (32.2%), while the elderly (>60 years) numbered 35 people (23.5%). Respondents were predominantly female, namely 60 people (80.3%), while males were 23 people (15.4%). Most respondents had low to secondary education levels, with the most education being elementary school (19.5%) and high school (16.8%). In terms of marital status, the majority of respondents were married (38.9%). Based on occupation, the largest group was housewives (22.8%) and unemployed respondents (12.8%). The duration of diabetes mellitus was most often less than five years (38.9%). The dominant type of therapy used was oral medication (47.0%). Most respondents lived with their partners (35.6%) and used BPJS as a source of treatment financing (51.0%).

Table 2 Frequency Distribution of Medication Adherence Stress Levels, and Quality of Life in Type 2 Diabetes Mellitus Patients

Variable	Category	Frequency (n)	Percentage (%)
Medication Adherence	High Adherence	39	26.2
	Moderate Adherence	21	14.1
	Low Adherence	23	15.4
Stress Level	Low Stress	39	26.2
	Moderate Stress	34	22.8
	High Stress	10	6.7
Quality of Life	High Quality of Life	40	26.8
	Moderate Quality of Life	38	25.5
	Low Quality of Life	5	3.4
Total		83	100.0

Based on Table 2, the majority of type 2 diabetes mellitus patients had high medication adherence, representing 39 respondents (26.2%). However, there were still 21 respondents with moderate adherence (14.1%) and 23 respondents with low adherence (15.4%), indicating variation in medication adherence behavior.

Regarding stress levels, the majority of respondents (39 respondents) were in the low stress category, followed by 34 respondents (22.8%), and 10 respondents (6.7%) with high stress. These results indicate that most patients are able to manage stress well, although there are still groups with stress levels that require attention.

Regarding quality of life, the majority of respondents (40 respondents) were in the high quality of life category, followed by 38 respondents (25.5%), and only a small number (5 respondents) had a low quality of life (3.4%). In general, these findings indicate that the majority of patients have good medication adherence, relatively low stress levels, and a fairly good quality of life.

Table 3 Relationship between of Medication Adherence and Stress Levels with Quality of Life Using the Chi-Square Statistical Test

Variable	High Quality of Life N(%)	Moderate Quality of Life N(%)	Low Quality of Life N(%)	p-value
Medication Adherence				
High	22 (26.5)	17 (20.5)	0 (0.0)	0.005
Moderate	10 (12.0)	11 (13.3)	0 (0.0)	
Low	8 (9.6)	10 (12.0)	5 (6.0)	
Stress Level				
Low	25 (30.1)	11 (13.3)	3 (3.6)	0.032
Moderate	13 (15.7)	20 (24.1)	1 (1.2)	
High	2 (2.4)	7 (8.4)	1 (1.2)	

Based on table 3, shows a significant relationship between medication adherence and quality of life in patients with type 2 diabetes mellitus at the Mulyorejo Community Health Center in Malang. The chi-square test yielded a p-value of 0.005 ($p \leq 0.05$), indicating that medication adherence significantly correlates with patient quality of life. Respondents with high medication adherence tended to have a better quality of life, as indicated by a higher proportion in the high quality of life category compared to respondents with moderate and low adherence. Conversely, respondents with low adherence were more likely to be in the low quality of life category.

For the stress level variable, the chi-square test also showed a significant relationship with quality of life, with a p-value of 0.032 ($p \leq 0.05$). These findings indicate statistical associations between variables and should not be interpreted as causal relationships due to the cross-sectional nature of the study design. Respondents with low stress levels predominantly had a high quality of life, while increasing stress levels were followed by an increase in the proportion of respondents with moderate to low quality of life. Respondents with high stress tended to have a poorer quality of life compared to the low and moderate stress groups.

The results of this study indicate a significant association between medication adherence and stress levels with the quality of life of type 2 diabetes mellitus patients in primary healthcare facilities. Patients who demonstrated better adherence to therapy generally reported a higher quality of life, encompassing physical, psychological, and social aspects. Conversely, increased stress levels correlated with a decreased quality of life. These findings confirm that quality of life in type 2 diabetes mellitus patients is shaped through a dynamic interaction between medication adherence behavior and accompanying psychological conditions, thus ensuring that disease management efforts cannot be separated from the patient's behavioral and psychosocial dimensions.

The relationship between medication adherence and quality of life can be understood through the perspective of health behavior theory, particularly the Health Belief Model and self-regulation theory. This framework emphasizes that an individual's perception of disease severity, the benefits of therapy, and their ability to control their health condition will influence adherence behavior and well-being. Optimal adherence plays a crucial role in maintaining stable blood glucose levels, thereby preventing or delaying the onset of chronic complications such as nephropathy, neuropathy, and cardiovascular disease (4).

These results align with the findings of (17), who reported a positive relationship between medication adherence and quality of life in diabetes patients in primary healthcare settings. Similar findings were also reported by (18), who showed that patients with high adherence had a better quality of life than those with poor adherence, both physically and psychologically. Furthermore, (11), using a structural equation modeling approach, confirmed that medication adherence is a key pathway linking psychosocial factors to quality of life in patients with type 2 diabetes mellitus. The role of social support and hope, as noted by (19), also strengthens adherence behavior and indirectly contributes to improving patients' quality of life.

The characteristics of the respondents in this study, who were predominantly adults and elderly, as well as women, provide important context for interpreting the

results. Increasing age is generally associated with decreased physical function, increased comorbidities, and increasingly complex therapy regimens, which can impact adherence and perceived quality of life. Furthermore, women often assume dual roles within the family and community, potentially increasing psychological burden and stress levels (20).

In addition to adherence, this study also shows that stress levels are significantly associated with quality of life in patients with type 2 diabetes mellitus. The higher the stress level, the lower the perceived quality of life. Theoretically, psychological stress can affect the neuroendocrine system through activation of the hypothalamic-pituitary-adrenal axis, contributing to increased blood glucose levels and decreased self-care ability (5).

These findings are consistent with the report by (21), which stated that anxiety and psychological distress negatively impact the quality of life of diabetes patients, particularly in the emotional and social dimensions. A study by (Thirunavukkarasu et al., 2025), also found a relationship between mental health conditions and quality of life in diabetes patients in the post-pandemic period. In this study, most respondents were in the low to moderate stress category, likely influenced by family support, relatively adequate socioeconomic stability, and easy access to primary health care. This finding aligns with a review by (Świątoniowska-Lonc et al., 2021), which emphasized that emotional support and effective coping mechanisms act as protective factors in maintaining quality of life while increasing therapy adherence.

The findings of this study also support the findings of Yorke et al. (16) and Vafopoulou et al., (6), which confirmed that stress and psychological distress are major determinants of quality of life in patients with chronic diseases, including diabetes mellitus. Unmanaged stress can trigger emotional exhaustion, sleep disturbances, decreased motivation for therapy, and decreased medication adherence, creating a negative cycle between psychological conditions and clinical outcomes.

From a practical perspective, the results of this study confirm that the management of type 2 diabetes mellitus cannot focus solely on pharmacological aspects. Ongoing education about the importance of medication adherence needs to be combined with psychosocial interventions that help patients manage stress effectively. Behavioral and psychological interventions, such as counseling, stress management, and mindfulness practices, have been shown to have significant potential in improving patient adherence and quality of life (7). Furthermore, service innovations such as telemonitoring have also shown potential in reducing diabetes distress and improving patients' quality of life (24).

In the context of nursing practice, particularly in primary healthcare, nurses play a strategic role as educators, counselors, and facilitators. A holistic nursing approach that integrates increased adherence to therapy with stress management can be an effective strategy for improving the quality of life of patients with type 2 diabetes mellitus. Thus, this study provides a theoretical contribution by strengthening the biopsychosocial framework for diabetes management, while also providing practical contributions to the development of community-based interventions that comprehensively address patient well-being.

However, this study has several limitations that require consideration. In addition, the cross-sectional design only allows the identification of associations between variables at a single point in time and does not permit conclusions regarding causal relationships between medication adherence, stress levels, and quality of life. Some respondents had limited reading and writing skills, requiring the researcher to provide assistance during the questionnaire completion. This situation could potentially lead to perceptual bias or influence from the researcher on respondents' responses. Furthermore, the use of a Likert-scale instrument may make it difficult for respondents with lower educational

levels to understand some statements, which could ultimately affect the accuracy and consistency of the data. The findings of this study have clear clinical implications for diabetes management in primary healthcare settings. First, medication adherence assessment should be integrated into routine nursing and outpatient evaluation for patients with type 2 diabetes mellitus, particularly during follow-up visits. Patients identified with low or moderate adherence may benefit from individualized medication education, reminder strategies, and family-based support interventions. Second, stress screening should be incorporated as part of holistic diabetes care, as psychological distress may negatively affect both treatment adherence and quality of life. Simple psychosocial screening tools can help healthcare providers identify patients who require early counseling or supportive interventions.

For nursing practice, these results emphasize the importance of the nurse's role not only as a care provider, but also as an educator, motivator, and psychosocial supporter. Nurses in primary care can contribute by providing continuous self-management education, reinforcing medication-taking behavior, involving family members in treatment support, and facilitating stress management strategies such as relaxation education, coping enhancement, and referral when needed. Thus, improving quality of life in patients with type 2 diabetes mellitus requires an integrated clinical approach that combines pharmacological management, adherence support, and psychosocial care. These limitations should be considered in interpreting the study results and serve as a basis for further research.

CONCLUSION

This study identified significant associations between medication adherence, stress levels, and quality of life among patients with type 2 diabetes mellitus. Higher medication adherence was associated with better quality of life, whereas higher stress levels were associated with poorer quality of life. These findings support the importance of behavioral and psychosocial aspects in diabetes management. However, due to the cross-sectional design, the findings should be interpreted as associative rather than causal relationships. Further longitudinal studies are recommended to better understand the direction and dynamics of these relationships.

ACKNOWLEDGMENT

The author expresses his deepest appreciation to all parties who have played a role and provided support in the implementation of this research. Thanks are extended to the healthcare institution where the research was conducted for granting permission, providing facilities, and collaborating throughout the data collection process. The same appreciation is extended to the respondents who volunteered their time and cooperatively participated, ensuring that this research proceeded as planned. Furthermore, the author would like to thank the supervising lecturers and academics who provided guidance, advice, and constructive scientific reviews from the planning stage through the completion of this article. Appreciation is also extended to the educational institutions and related parties who provided administrative and technical support, as well as to family and colleagues for their moral support throughout the research process. All of these contributions played a vital role in supporting the smooth implementation and quality of this research.

REFERENCE

1. Care D, Suppl SS. Introduction and Methodology : Standards of Care in Diabetes — 2024. 2024;47(December 2023):1–4.
2. World Health Organization (WHO). Diabetes [Internet]. 2023. Available from: https://www.who.int/healthtopics/diabetes#tab=tab_1
3. IDF. Diabetes Atlas 11th Edition. Diabetes Atlas 11th Edition. 2025. 1–399 p.
4. Rodríguez-Aguilar Y, López-Guzmán O,

Padilla-Raygoza N, Hernández-Jaime E, Sánchez-Castillo Y, Amador-Espinosa M, et al. Analysis of the Effect of Therapeutic Adherence on Quality of Life in Patients with Type 2 Diabetes: A Cross-Sectional Study. Int J Trop Dis Heal. 2025;46:76–90.

5. Yang H, Wu F, Gui M, Cheng Y, Zhang L. The role of medication adherence in the association between depressive symptoms and quality of life in older adults with type 2 diabetes mellitus. BMC Geriatr. 2023 Mar;23(1):196.
6. Vafopoulou E, Christodoulou N, Papathanasiou I V. Treatment Adherence and Quality of Life Among Elderly Patients With Diabetes Mellitus Registered in the Community. Cureus. 2024 Apr;16(4):e58986.
7. Chantzaras A, Yfantopoulos J. Association between medication adherence and health-related quality of life of patients with diabetes. Hormones (Athens). 2022 Dec;21(4):691–705.
8. Mishra R, Sharma SK, Verma R, Kangra P, Dahiya P, Kumari P, et al. Medication adherence and quality of life among type-2 diabetes mellitus patients in India. World J Diabetes. 2021 Oct;12(10):1740–9.
9. Li X, Wu L, Yun J, Sun Q. The status of stigma in patients with type 2 diabetes mellitus and its association with medication adherence and quality of life in China: A cross-sectional study. Medicine (Baltimore) [Internet]. 2023;102(26). Available from: https://journals.lww.com/md-journal/fulltext/2023/06300/the_status_of_stigma_in_patients_with_type_2.16.aspx
10. Turen S. The Relationship with Acceptance of Illness and Medication Adherence in Type 2 Diabetes Mellitus Patients. 2021;14(3):1824–32.
11. Huang J, Ding S, Xiong S, Liu Z. Medication Adherence and Associated Factors in Patients With Type 2 Diabetes : A Structural Equation Model. 2021;9(November):1–11.
12. Mahajan A, Muley A. Assessment of lifestyle factors , stress levels , and quality of life among people with Type 2 Diabetes Mellitus. Discov Public Heal [Internet]. 2024; Available from: https://doi.org/10.1186/s12982-024-00173-2
13. Abualhamael S, Baig M, Alghamdi W, Gazzaz Z, Al-Hayani M, Bazi A. Quality of life, stress, anxiety and depression and associated factors among people with type 2 diabetes mellitus in Western region Saudi Arabia. Front Psychiatry [Internet]. 2024;14. Available from: https://consensus.app/papers/quality-of-life-stress-anxiety-and-depression-and-al-hayani-baig/1b1a302a1d8e540fb59fa51d9ec3661d/
14. Lo Monaco M, Profeta A, Corrao S. Telenursing as an Effective Ally for Improving Patient Outcomes in Diabetes? An Umbrella Review. Nurs open. 2025 Jul;12(7):e70265.
15. Elayyan B, Abuhalima D, Al-Jabi SW, Zyoud SH. Association of medication adherence and glycemic control with pain severity among patients with diabetes mellitus: a cross-sectional study from Palestine. BMC Endocr Disord. 2025 Jul;25(1):180.
16. Yorke E, Boima V, Ganu V, Tetteh J, Twumasi L, Ekem-Ferguson G, et al. The mediating role of quality of life on depression and medication adherence among patients with type 2 diabetes mellitus: A cross-sectional study. Heal Sci reports. 2023 Sep;6(9):e1539.
17. Khayyat SM, Mohamed MMA, Saeed SM, Raghda K, Alhazmi SH. Association between medication adherence and quality of life of patients with diabetes and hypertension attending primary care clinics : a cross-sectional survey. Qual Life Res [Internet]. 2018;0(0):0. Availablefrom:http://dx.doi.org/10.1007/s11136-018-2060-8
18. Majeed A, Rehman M, Hussain I, Imran I,

Saleem MU, Saeed H, et al. The Impact of Treatment Adherence on Quality of Life Among Type 2 Diabetes Mellitus Patients - Findings from a Cross-Sectional Study. Patient Prefer Adherence. 2021;15:475–81.

19. Pazokian M, Beigmoradi S, Movafegh F, Akbarzadeh S. Correlation between Social Support and Hope with Medication Adherence in Type II Diabetic Patients. 2020;11:130–5.
20. Susanti W, Handoko G, Isnawati IA. Hubungan Dukungan Keluarga, Kepatuhan Minum Obat dan Tingkat Stres dengan Kualitas Hidup Pada Pasien Diabetes Mellitus Tipe II di RSUD Soedarsono. J Ilmu Kesehat [Internet]. 2023;2(10):266–76. Available from: https://journal.mandiracendikia.com/index.php/JIK-MC/article/view/614/490
21. Martino G, Catalano A, Bellone F, Russo GT, Vicario CM, Lasco A, et al. As Time Goes by : Anxiety Negatively Affects the Perceived Quality of Life in Patients With Type 2 Diabetes of Long Duration. 2019;10(July):1–8.
22. Thirunavukkarasu, A., Alharbi, M. S., Salahuddin, M., Al-Hazmi, A. H., ALruwaili, B. F., Alsaidan, A. A., ... & Alrashoudi LI. Evaluation of oral health-related quality of life and its association with mental health status of patients with type 2 diabetes mellitus in the post-COVID-19 pandemic era : A study from Central Saudi Arabia. 2025;(March).
23. Świątoniowska-Lonc, N., Tański, W., Polański, J., Jankowska-Polańska, B., & Mazur G. Psychosocial Determinants of Treatment Adherence in Patients with Type 2 Diabetes – A Psychosocial Determinants of Treatment Adherence in Patients with Type 2 Diabetes – A Review. 2021;7007.
24. Sanan, Y. C. U., & Nitsae V. THE EFFECT OF TELEMONITORING ON DIABETES DISTRESS IN PATIENTS WITH TYPE II DIABETES MELLITUS IN RI-RDTL BORDER. 2025;10(1):8–12.