Orginal Article

Open Access

Iranian Journal of Diabetes and Obesity (IJDO)

Assessing Medication Adherence and Quality of Life among Type 2 Diabetic Outpatients in Al-Hilla, Iraq 2023

Alice Khachian[1], Tahereh Alsadat Khoubbin Khoshnazar[2*], Shima Haghani[3], Duaa Sabah Najem[4], Kosar zeighami[5], Elham Akhlaghi[6]

[1]Professor, Nursing and Midwifery Care Research Centre, School of Nursing and Midwifery, Iran University of Medical Sciences, Tehran, Iran.
[2]Assistant Professor, Nursing and Midwifery Care Research Centre, School of Nursing and Midwifery, Iran University of Medical Sciences, Tehran, Iran.
[3]MSc in Biostatistics, Nursing Care Research Center, Iran University of Medical Sciences, Tehran, Iran.
[4]MSc, School of Nursing and Midwifery, Iran University of Medical Sciences, Tehran, Iran.
[5]MS in Rehabilitation Nursing, School of Nursing and Midwifery, Iran University of Medical Sciences, Tehran, Iran
[6]Assistant Professor, Nursing and Midwifery Care Research Centre, School of Nursing and Midwifery, Iran University of Medical Sciences, Tehran, Iran.

Abstract

Objective: The rising occurrence of type 2 diabetes mellitus in Iraq, impacted by changes in lifestyle and strain on the healthcare system, is worsened by the significant issue of inadequate treatment adherence. As a result, this scenario leads to inadequate glycemic control and an increased risk of severe disease complications. The objective of this research was to assess medication adherence and quality of life (QOL) in indivduals with type 2 diabetes at the Al-Hilla Diabetic Center in 2023.

Materials and Methods: A cross-sectional study was carried out at diabetic centers and outpatient clinics in Marjan Hospital and Imam Al-Sadiq Hospital in Al-Hilla City, Babylon Province, Iraq. A total of 355 patients with T2DM who were attending diabetic centers and hospitals in Al-Hilla, Babylon were included in the study using a convenience sampling method. Regression linear tests were utilized to explore the factors that may influence adherence.

Results: The data analysis showed that the QOL was relatively good (47.32± 22.13) and medication adherence was 4.64± 1.42. This study indicated that age significantly influences the QOL of patients with T2DM ($P\leq 0.001$). Additionally, medication adherence was found to be significantly associated with age, work, educational level, income, and living condition ($P\leq 0.001$), while there was no statistical significance observed with marital status and gender ($P\geq 0.001$).

Conclusion: Diabetes Nurse Specialists need to consider factors that impact QOL and develop strategies to enhance both QOL and medication adherence.

Keywords: Diabetes mellitus, Insulin resistance, Quality of life, Medication adherence

QR Code:

Citation: Khachian A, Khoubbin Khoshnazar T A, Haghani S, Najem D S, zeighami K, Akhlaghi E. Assessing Medication Adherence and Quality of Life among Type 2 Diabetic Outpatients in Al-Hilla, Iraq 2023. IJDO 2026; 18 (1) :9-17

URL: http://ijdo.ssu.ac.ir/article-1-1013-en.html

10.18502/ijdo.v18i1.21057

Article info:

Received: 25 July 2025

Accepted: 20 September 2025

Published in February 2026

Corresponding Author:

Tahereh Alsadat Khoubbin Khoshnazar, Assistant Professor, Nursing and Midwifery Care Research Centre, School of Nursing and Midwifery, Iran University of Medical Sciences, Tehran, Iran.

Tel: (+98) 09113485201

Email: khoshnazar.t@iums.ac.ir

Orcid ID: 0000-0001-7872-1025

[DOI: 10.18502/ijdo.v18i1.21057]

Introduction

Diabetes mellitus is a diverse group of characterized by elevatedin blood glucose level. The rising prevalence of diabetes necessitates focused screening efforts to identify diabetes and prediabetes in high risk populations (1). The incidence of diabetes mellitus is on the rise, often resulting in substantial metabolic disease and serious complications (2).

Diabetes mellitus poses a significant global health challenge due to its increasing prevalence (3). In 2014, the World Health Organization reported 422 million cases of diabetes worldwide, with and projections indicating that this number could reach around 700 million adults worldwide by 2045 (4).

The global prevalence of diabetes among individuals aged 20 to 79 in 2021 is estimated to be 5.10% (equivalent to 536.6 million people) (1).Over the past decade, diabetes has emerged as an epidemic in Iraq, with significant increase from 724.8/100,000 in 2003 to 745.5/100,000 in 2023. Approximately 1.4 million Iraqis people are living with diabetes, and the reported prevalence of type 2 diabetes in Iraq ranges from 8.5% to 13.9% (2). The limited number of epidemiological studies and randomized controlled trials in Iraq hinders a comprehensive assessment of diabetes prevalence in the country. Diabetes impacts various complications, including a high risk of cardiovascular diseases, heart and brain strokes, falls, blindness, infections, and multiple wounds (3). Therefore, it is crucial to employ all available methods to manage blood sugar levels effectively. Among these methods, medication adherence is plays a critical role in stabilizing blood glucose levels.

Medication adherence for glycemic control in patients with T2DM considered a significant a public health concern, as it reduces the risk of diabetes complications (1). Studies suggest that following prescribed therapies could avert no fewer than 100,000 preventable deaths and $100 billion in avoidable healthcare costs annually (2). Despite the proven benefits of prescribed medications for managing T2DM symptoms, non-adherence rates to these therapies vary widely, ranging from 36% to 93%, within and between countries (3). Improving diabetes management requires a targeted approach to evaluating and enhancing patient adherence to prescribed treatments to improve clinical outcomes. Nurses play a crucial role in addressing treatment gaps in managing risk factors for diabetes. Their unique position role in diabetic care allows them to effectively meet the complex needs of this patient population (4).

Diabetes like other chronic diseases can have short and long-term consequences that affect quality of life (QOL) (5). QOL refers to an individual’s perception of their physical, emotional, and social well-being (6). Lower QOL has been associated with more severe disease (7). This highlights the literature accentuates the importance of assessing QOL in chronic patients, particularly those with diabetes. Effective blood glucose control through medication adherence is essential for preventing the serious and costly complications of diabetes. Diabetes as a chronic condition significantly impacts patients' QOL in various aspects.

While the relationship between medication adherence and QOL has been extensively studied in different global settings, there is a notable lack of evident specifically for the population in Al-Hilla, Iraq. The absence of local data hinders the development of targeted educational and supportive interventions. This means healthcare providers, including nurses who play a key role in patient care, must implement these important initiatives without context-specific evidence, potentially reducing their effectiveness.

Therefore, due to the lack of structured studies in this area, it is crucial and urgent to conducting research that examines both treatment adherence and QOL in the type 2

[DOI: 10.18502/ijdo.v18i1.21057]

diabetic population in Iraq. This study can offer valuable insights for policymakers and healthcare providers particularly nurses to develop tailored programs to enhance health outcomes and the QOL for these patients. With this in mind the study aims to explore the medication adherence and quality of life among outpatients with type 2 diabetes at the Al-Hilla Diabetes Centre in Babylon, Iraq in 2023.

Material and methods

A cross-sectional study was in the Diabetic centers and outpatient diabetic clinics at Marjan Hospital and Imam Al-Sadiq Hospital in Al-Hilla, Babylon, Iraq to evaluate medication adherence and QOL among patients with Type 2 Diabetes. Patients with T2DM who were receiving treatment at these facilities in Al-Hilla, Babylon were included in the study using a convenience sampling method. Inclusion criteria were: 18 years of age or older; diagnosed with T2DM for more than 6 months by a physician and referred to the research settings; able to read, speak, and understand Arabic; having healthy vision and hearing; not diagnosed with cognitive impairment by a physician diagnosis. A total of 355 patients were enrolled in the study.

The sample size was calculated using a single population proportion formula to estimate a high adherence level as follows: n= (z(1-α/2)^2pq)/d^2= 355, where the adherence level was considered 0.36, according to Alrahbeni et al. (1).

Participants were given a detailed folder with study information, relevant questionnaires, and a consent form upon enrollment. A researcher provided in-person explanations of the study's objectives and procedures. The survey package included a sociodemographic checklist, the Morisky Medication Adherence Scale (MAQ), and the WHO Quality of Life (WHOQOL) instrument, which took approximately 10-15 minutes to complete.

A 2013 study was conducted to evaluate the reliability and validity of the Arabic version of the Medication Adherence Questionnaire (MAQ) among individuals with type 2 diabetes at a referral center in Tripoli, Libya. A total of 103 patients completed the questionnaire as part of a convenience sample. Reliability was assessed using Cronbach's alpha, average inter-item correlation and Spearman-Brown coefficient. Known-group validity was examined by comparing the MAQ scores among patients categorized by glycemic control. The Arabic MAQ demonstrated acceptable split-half reliability (r= 0.65) and adequate internal consistency (α= 0.70). A significant association between medication adherence and glycemic control was discovered, with a moderate effect size (c= 0.34), supporting known-group validity. The Arabic version of the MAQ exhibited strong psychometric properties, making it a valuable tool for diabetes research and management in Arab countries (1).

A total of 355 patients provided consent and participated in the survey. All collected data were analyzed using IBM SPSS Statistics, Version 21. Descriptive statistics were used to analyze patients' socio-demographic characteristics, level of treatment adherence, and combination of knowledge and attitude. Among sociodemographic data, health and level of adherence, continuous variables were presented as means and standard deviations, and categorical variables by frequencies and percentages. Regression linear tests were used to understand the potential factors of adherence.

Bivariate analysis will be employed to examine associations between medication adherence levels and various sociodemographic characteristics, health-related data, adherence knowledge, and attitudes/beliefs. Variables demonstrating significant associations with adherence levels in these initial analyses will subsequently be entered into a logistic regression model. The regression analysis will report odds ratios with corresponding confidence intervals for predictive variables, using a predetermined level of statistical significance (2).

[DOI: 10.18502/ijdo.v18i1.21057]

Ethical considerations

Following ethical approval from Iran University of Medical Sciences and the Iraq Ministry of Health (IR.IUMS.REC 1402.298), data were gathered through a paper-based, self-reported data collection approach.

Results

Demographic characteristics show that the data were mostly over 50 years old (33%), mostly female (54.6%) and married (57.2%) (Table 1). The raw data obtained from the medication adherence questionnaire are shown in Table 2. The analyzed data from (QOL) questionnaire and its domains are presented in Tables 3 and 4, respectively. The results from Table 3 indicate that (QOL) is rated at a moderate to good level. Table 5 shows the results of the one-way analysis of variance and the results of the T-test for independent samples.

From it, we conclude that there are statistically significant differences in the QOL levels of patients with age, where the F-value (3.150) came with a probability value (0.015) less than (0.05). This study reported that there is no statistically significant difference in QOL levels of patients with demographic characteristics such as marital status, work, educational level, income, gender, and region.

Discussion

Our results extracted from the Demographic checklist are consistent with a study conducted by Nonogaki et al. (2019) on the distribution of demographic data in terms of age, gender, occupation, education level, and income (1).

To address this issue, healthcare providers should prioritize patient education and counseling on the importance of medication adherence.

Additionally, implementing reminder systems, such as text message alerts or pill organizers, can help patients stay on track with their medication regimen.

Table 1. Demographic characteristics of patients

Demographic characteristics		Frequency	%
Age (years)	<35	38	10.7
	36-40	66	18.6
	41-45	80	22.5
	46-50	54	15.2
	>50	117	33.0
	Total	355	100
Gender	Male	161	45.4
	Female	194	54.6
	Total	355	100.0
Marital status	Single	40	11.3
	married	203	57.2
	lost spouse	112	31.5
	Total	355	100.0
Work	Unemployed	154	43.4
	Employed	126	35.5
	Retired	75	21.1
	Total	355	100.0
Region	Rural	150	42.3
	Urban	205	57.7
	Total	355	100.0
Educational level	Illiterate	54	15.2
	primary school	62	17.5
	secondary school	85	23.9
	Diploma & more	154	43.4
	Total	355	100.0
Income	Enough	217	61.1
	adequate	85	23.9
	Not enough	53	14.9
	Total	355	100.0

[DOI: 10.18502/ijdo.v18i1.21057]

Regular follow-up appointments and monitoring of adherence levels can also be beneficial in improving patient outcomes. By taking these proactive measures, healthcare

Table 2. Data obtained from medical adherence questionnaire

Information	Yes		No	
	Frequency	%	Frequency	%
Q1	227	63.9	128	36.1
Q2	126	35.5	229	64.5
Q3	157	44.2	198	55.8
Q4	191	53.8	164	46.2
Q5	266	74.9	89	25.1
Q6	111	31.3	244	68.7
Q7	137	38.6	218	61.4

	Never/rarely		Once in a while		Sometime		Usually		All the time	
Q8	f	%	f	%	f	%	f	%	f	%
	19	5.4	73	20.6	98	27.6	124	34.9	41	11.5

Table3. Analyzed data obtained from QQL

Item	Not at all		Little		Moderate		Very much		Extreme		Mean (SD)
	f	%	f	%	f	%	f	%	f	%	
Q1	46	13.0	95	26.8	111	31.3	71	20.0	32	9.0	2.85 (1.15)
Q2	57	16.1	82	23.1	99	27.9	62	17.5	55	15.5	2.93 (1.29)
Q3	23	6.5	48	13.5	88	24.8	107	30.1	89	25.1	3.52 (1.15)
Q4	18	5.1	56	15.8	163	45.9	73	20.6	45	12.7	3.20 (1.01)
Q5	46	13.0	88	24.8	99	27.9	75	21.1	47	13.2	2.96 (1.22)
Q6	30	8.5	82	23.1	109	30.7	79	22.3	55	15.5	3.13 (1.18)
Q7	22	6.2	99	27.9	142	40.0	75	21.1	17	4.8	2.90 (0.96)
Q8	23	6.5	105	29.6	156	43.9	62	17.5	9	2.5	2.80 (0.89)
Q9	17	4.8	54	15.2	199	56.1	69	19.4	16	4.5	3.03 (0.84)
Q10	37	10.4	137	38.6	126	35.5	44	12.4	11	3.1	2.95 (0.94)
Q11	2	0.6	118	33.2	172	48.5	52	14.6	11	3.1	2.86 (0.73)
Q12	10	2.8	55	15.5	128	36.1	123	34.6	39	11.0	3.35 (0.96)
Q13	23	6.5	48	13.5	88	24.8	107	30.1	89	25.1	3.52 (1.15)
Q14	8	2.3	48	13.5	144	40.6	140	39.4	15	4.2	3.35 (0.67)
Q15	17	4.8	54	15.2	199	56.1	69	19.4	16	4.5	3.03 (0.84)
	Very dissatisfied		Dissatisfied		Neither satisfied nor dissatisfied		Satisfied		Very satisfied		
	f	%	f	%	f	%	f	%	f	%	
Q1	17	4.8	54	15.2	199	56.1	69	19.4	16	4.5	3.38 (0.61)
Q2	37	10.4	137	38.6	126	35.5	44	12.4	11	3.1	3.29 (0.83)
Q3	11	3.1	41	11.5	126	35.5	125	35.2	52	14.6	3.29 (0.96)
Q4	28	7.9	68	19.2	109	30.7	134	37.7	16	4.5	3.41 (0.87)
Q4	0	0	62	17.5	123	34.6	152	42.8	18	5.1	3.38 (0.81)
Q5	0	0	23	6.5	176	49.6	154	43.4	2	0.6	3.35 (0.81)
Q6	8	2.3	48	13.5	144	40.6	140	39.4	15	4.2	3.35 (0.67)
Q7	16	4.5	53	14.9	123	34.6	137	38.6	26	7.3	3.11 (1.02)
Q8	11	3.1	41	11.5	126	35.5	125	35.2	52	14.6	3.35 (0.82)
Q9	33	9.3	54	15.2	96	27.0	127	35.8	45	12.7	3.63 (0.70)
	Always		Very often		Quite often		Seldom		Never		
	f	%	f	%	f	%	f	%	f	%	
Q10	13	3.7	82	23.1	142	40.0	91	25.6	27	7.6	3.62 (0.66)

Table 4. Distribution of patients according to their QOL domains

QOL elements	N	Minimum	Maximum	Mean	S.D
Physical. (100)	355	28.57	89.29	56.09	11.00
Psychological. (100)	355	25.00	87.50	52.52	10.76
Social relationships. (100)	355	33.33	91.67	60.86	10.41
Environment. (100)	355	28.13	81.25	56.32	10.34
Total. (100)	355	0.00	100.0	47.32	22.13

[DOI: 10.18502/ijdo.v18i1.21057]

providers can help enhance medication adherence among patients with type 2 diabetes and ultimately improve their overall health and well-being (1). Nonogaki et al. (2019) concluded that 50.7% of patients with T2DM were at a moderate or low level of medication adherence, while 49.3% of them were at a high level (2). However, these findings contrast with those reported by Lee et al. (2017), whose study identified significantly higher medication adherence rates. In their research, the highest adherence was observed among patients prescribed DPP-4 inhibitors (sitagliptin, 67.7%), followed by those on sulfonylureas (gliclazide, 56.5%; glipizide, 53.5%; tolbutamide, 53.1%), alpha-glucosidase inhibitors (acarbose, 50.1%), and biguanides (45.2%) (3).

This study reported that the physical domain of QOL was 56.09± 11.00, the psychological domain was 52.52± 10.76, social relationships were reported as 60.86± 10.41, and the environment domain was 56.32± 10.34. The QOL of patients with diabetes mellitus in this study was fairly good; approximately 1 out of 7 patients rated poor for overall QOL, while more than 6 out of 10 and 1 out of 5 rated fair and good, respectively. For health satisfaction, approximately 3 out of 10 patients rated poor compared to 1 out of 10 and 3 out of 5 patients who rated good and fair, respectively. For the physical domain (domain 1), 3 out of 20 patients rated poor.

For the psychological domain (domain 2), 1 out of 5 patients rated poor. For social relationships (domain 3), only 1 out of 15 patients rated poor, and all patients rated fair for the environment (domain 4). The present findings align with research conducted by Ababio et al. (2017), who surveyed 198 patients in Ghana and 203 in Nigeria, with female-to-male ratios of 3:1 and 2:1, respectively. Their study reported relatively low QOL scores in both populations (56.19± 8.23 in Ghana and 64.34± 7.34 in Nigeria). Significant correlates of QOL included medication adherence (P= 0.02) and employment status (P= 0.02) in the Ghanaian cohort, while employment status (P= 0.02) and diabetes empowerment (P= 0.03) emerged as significant predictors in the Nigerian sample (1).

The results demonstrate statistically significant associations between medication adherence and several sociodemographic variables, including age, occupation, educational level, income, and region ($P\leq$ 0.001). In contrast, no significant relationships were observed between medication adherence and marital status or gender ($P\geq$ 0.05). This means that patients' medication adherence is affected by age, work, education, income, and region but not by marital status and gender. These results are consistent with a study conducted by Nonogaki et al. (2019), which concluded that 49.3% of participants had a high level of diabetes medication adherence. High diabetes medication adherence was associated with a better family economic condition.

The proportion of people with a high level of diabetes medication adherence was significantly higher among female participants (53.7%, P= 0.004), those who were not married (61.4%, P= 0.001), and those with higher monthly family income (> 50 USD, $P<$ 0.001) (2)

Also, Huber and Reich (2016) reported that good medication adherence was determined by patients' sociodemographic characteristics (older age groups, male sex) and health status (high numbers of comorbid conditions, intensified diabetes drug therapy). However, the results of this study provide evidence that the dispensing channel does not have an impact on adherence in Swiss patients with diabetes. Certainly, medication adherence needs to be improved in both supply settings. (3). Lee et al. (2017) reported that oral medication adherence among patients with type 2 diabetes mellitus is affected by age and marital status, with p-values of 0.01 and 0.02, respectively (4). The results of this study disagree with Aloudah et al. (2018), who reported that medication adherence was affected only by $P\leq$ 0.001 but not affected by

[DOI: 10.18502/ijdo.v18i1.21057]

gender, marital status, education, and income ($P \geq 0.001$) (5).

Discussing the association between patients' QOL levels and their demographic characteristics, this study indicates that there are statistically significant differences in QOL with age ($P \leq 0.001$). However, there is no statistical significance between QOL levels and demographic characteristics such as marital status, work, educational level, income, gender, and region ($P \geq 0.001$).

These findings contrast with the study by Seyedoshohadaee et al., where health literacy was statistically significant with three aspects of general health, anxiety, and sleep disorders ($P= 0.0029$, -0/154), social functioning ($P= 0.013$, r: -0.176), and depression ($P= 0.002$, r: -0.218) (6).

Our results are also in line with Papazafiropoulou (2015), indicating that Diabetes mellitus type 2 had a negative impact on the QOL in 37.3% of the study participants, while 32.9% believed that their life would have been better (7).

The results of the present study showed that T2DM per se has a negative impact on patients' QOL, most notably affecting their working life, health status, family and sexual life, future perspectives, and dietary habits. Age and marital status were the only determinants of QOL.

Recommendation

Findings of this study suggest that patients with type 2 diabetes have desirable medication adherence and quality of life. Based on the results of this research, two fundamental strategies are proposed for enhancing diabetes management: developing structured educational programs tailored to patients' demographic characteristics (age, education level, and comorbidities) to improve medication adherence and quality of life, and building the capacity of healthcare providers, including nurses and care providers, to deliver personalized education and regularly monitor medication adherence. These evidence-based recommendations provide a practical framework for health policymakers and clinical specialists to address the specific needs of the type 2 diabetes patient population through targeted interventions.

Limitations

As with all research involving self-report questionnaires, there might be a false impression or reports of medication adherence and QOL. Another limitation is the use of a convenience sampling method in this study, which imposes limitations on the generalizability of the findings.

Conclusions

QOL in diabetes mellitus is affected by age, and medication adherence is influenced by age, educational level, income, and living conditions. Diabetes nurse specialists, community-based nurses, and managers should enhance their understanding of the factors that impact quality of life and medication adherence, and develop strategies to improve both.

Acknowledgments

This article is the result of a research project approved by the Research Department of the International Campus of the University of Medical Sciences in Iran in 2023. The researcher would like to express their gratitude to the officials and staff of the following hospitals: Diabetes Centre in Marjan Hospital and Sadiq Hospital in Babylon Province. Many thanks to the staff of Iran University of Medical Sciences, Dr. Alice Khachian.

Funding

This research did not receive any grant from funding agencies in the public, commercial, or non-profit sectors.

Conflict of Interest

The authors declare that they have no competing interests.

[DOI: 10.18502/ijdo.v18i1.21057]

Authors' contributions

Conceptualization and Supervision: A.KH and TA.KH.

Investigation and writing original draft: TA.KH and E.A.

Data collection: SH.H, D.SN and K.Z.

All authors read and approved the final manuscript.

[DOI: 10.18502/ijdo.v18i1.21057]

References

1. Ababio GK, Bosomprah S, Olumide A, Aperkor N, Aimakhu C, Oteng-Yeboah A, et al. Predictors of quality of life in patients with diabetes mellitus in two tertiary health institutions in Ghana and Nigeria. Nigerian Postgraduate Medical Journal. 2017;24(1):48-55.
2. Nonogaki A, Heang H, Yi S, van Pelt M, Yamashina H, Taniguchi C, et al. Factors associated with medication adherence among people with diabetes mellitus in poor urban areas of Cambodia: A cross-sectional study. PLoS One. 2019;14(11):e0225000.
3. Huber CA, Reich O. Medication adherence in patients with diabetes mellitus: does physician drug dispensing enhance quality of care? Evidence from a large health claims database in Switzerland. Patient preference and adherence. 2016:1803-9.
4. Lee CS, Tan JHM, Sankari U, Koh YLE, Tan NC. Assessing oral medication adherence among patients with type 2 diabetes mellitus treated with polytherapy in a developed Asian community: a cross-sectional study. BMJ open. 2017;7(9):e016317.
5. Aloudah NM, Scott NW, Aljadhey HS, Araujo-Soares V, Alrubeaan KA, Watson MC. Medication adherence among patients with Type 2 diabetes: A mixed methods study. PloS one. 2018;13(12):e0207583.
6. Seyedoshohadaee M, Ehsani M, Haghani S, SHojaiee Motlagh S. Knowledge, attitude and performance of people with diabetes in relation to covid-19 disease. Iranian Nursing Journal. 2022;139(5):504-9.
7. Papazafiropoulou AK, Bakomitrou F, Trikallinou A, Ganotopoulou A, Verras C, Christofilidis G, et al. Diabetes-dependent quality of life (ADDQOL) and affecting factors in patients with diabetes mellitus type 2 in Greece. BMC research notes. 2015;8(1):786.

[DOI: 10.18502/ijdo.v18i1.21057]