

Early Predictors of Quality of Life among Patients with Type 2 Diabetes Mellitus in Southern Jordan

SAGE Open Nursing

Volume 11: 1–9

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DOI: 10.1177/23779608251323813

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Abstract

Background: Type 2 Diabetes Mellitus is highly prevalent worldwide and especially in Jordan, presenting a significant challenge in mitigating its associated complications, thereby emphasizing the need for effective management strategies.

Aim: The aim of the study was to investigate early predictors of quality of life (QOL) among patients with Type 2 Diabetes Mellitus in Southern Jordan, focusing on examining the relationships and associations between diabetes self-efficacy, glycemic control, and diabetes self-care with QOL.

Methodology: The study adopted a cross-sectional approach conducted within Southern Jordan, employing a convenience sampling method. Participants were chosen based on their availability and willingness to take part. The study encompassed a sample size of 204 patients diagnosed with type 2 diabetes. The study utilized the Diabetes Self-Management Questionnaire and the Diabetes Management Self-Efficacy Scale to assess diabetic patients' self-care levels and self-efficacy, respectively. Data collection spanned from 1 February to 15 May 2023.

Results: Patients demonstrated suboptimal self-care and low self-efficacy. Significant positive correlations were found between QOL dimensions, self-management, and self-efficacy. Predictors for Type 2 Diabetes Mellitus (T2DM) patients' QOL were identified. For physical health, factors such as gender, comorbidities, age, occupation, location, self-care behaviors, and self-efficacy influenced QOL. Similar predictors were found for psychological, social, and environmental health dimensions, including gender, comorbidities, HbA1c levels, city of residence, marital status, and income, as well as self-care behaviors and self-efficacy.

Conclusions: The study findings underscore the importance of targeted interventions to improve the QOL for individuals with T2DM in Southern Jordan.

Keywords

Diabetes, Jordan, hospitals, quality of life, self-efficacy

Received: February 6, 2024; revised: January 24, 2025; accepted: February 9, 2025

Introduction

Type 2 Diabetes Mellitus (T2DM) is one of the most common diseases in the world. It's the seventh major cause of death worldwide (Al-Sahouri et al., 2019; Amer et al., 2018; Aminuddin et al., 2021; Awad et al., 2020). The prevalence of diabetes among Jordanians is 11.8% (Hurst et al., 2020). Numerous modifiable risk factors contribute to the development of diabetes mellitus, including smoking, an unhealthy diet, obesity, as well as stress and anxiety (Al-Sahouri et al., 2019; Awad et al., 2020). These risk factors and the resulting complications put Jordan in front of health and economic challenges, with the annual expenditure of treating diabetes

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patients nearing half a million Jordanians. (Qutaishat, 2018). Appropriate knowledge of diabetes management contributes to preventing, reducing, and delaying the occurrence of complications, consequently improving the quality of life (QOL) for patients with T2DM (Hurst et al., 2020). There are many variables that may be used to assess the QOL of a diabetic patient, including self-efficacy, self-care, and glycemic control. Self-efficacy is defined as “a cognitive process that occurs through the influence of individuals on the environment and social factors and the acquisition of new behaviors that affect their ability to improve the future” (Farley, 2020). Fathi A. Amer et al. (2018) demonstrated that self-efficacy plays a significant role in enhancing self-management practices across various chronic health conditions. Similarly, Smith et al. (2023) conducted a study focusing on diabetes management and found compelling evidence supporting the pivotal role of self-efficacy. Their findings indicated that as self-efficacy improved over time, individuals experienced better management outcomes in diabetes care, evidenced by lower HbA1c levels, and an overall enhancement in QOL. As for the self-care factor, according to the World Health Organization is defined as “the ability of individuals, families, and communities to promote health, prevent disease, maintain health, and cope with illness and disability, with or without the support of a healthcare provider”. Additionally, self-monitoring of blood glucose, dietary management, regular physical activity, foot care, and medication are essential components for enhancing glycemic control (Hartweg & Metcalfe, 2022). Adopting a healthy lifestyle enables T2DM patients to adapt and live with the disease (Qutaishat, 2018), (Al-Qahtani, 2020). Given that T2DM is a chronic condition, patient self-efficacy and self-care practices play a vital role in managing the disease. Evaluating a patient’s self-efficacy, self-care and monitoring of blood glucose can be a useful diagnostic technique for determining whether or not they are willing to undertake behavioral adjustments to manage diabetes. Therefore, this study is intended to investigate the association between self-efficacy, self-care practices, and glycemic control among T2DM patients, with the aim of identifying effective predictors to improve disease management and outcomes.

Research Problem

The existing body of research on T2DM extensively covers various facets of the condition. However, there remains a notable gap regarding investigations into self-care behaviors, self-efficacy, and glycemic control, and their correlation with the QOL among T2DM patients in Jordan, particularly in the southern region. This gap highlights the need to explore the levels of QOL and the associated factors among T2DM patients in southern Jordan. Understanding these factors is crucial for informing policymakers in crafting health policies aimed at enhancing the QOL and promoting health awareness among T2DM patients in the region

Significance of the Study

The study’s significance lies in establishing a comprehensive database to aid researchers and policymakers in improving the QOL for T2DM patients in southern Jordan. Moreover, the study seeks to offer practical solutions to address the unique challenges faced by T2DM patients, with a focus on preventing and delaying disease-related complications. By identifying early predictors of QOL, the study empowers healthcare providers to intervene proactively, thereby potentially mitigating the impact of the disease on patients’ well-being.

Methodology

Study Design

This cross-sectional study was conducted in Southern Jordan during 2023, spanning from January to May. The study aimed to investigate early predictors of QOL among patients diagnosed with T2DM in the region.

Sample and Sampling

The sample comprised 204 patients diagnosed with type 2 diabetes. Its size was determined using the G*power 3.1 program, aiming for a two-tailed statistical power of 0.95 and a significant alpha of 0.05. Although the planned sample size was 170, it was increased by 20% to account for non-respondents, resulting in a total of 206 individuals. A convenience sampling technique was employed, with random re-selection, across three hospitals in the southern governorates of Jordan. All participants were recruited according to predefined inclusion and exclusion criteria. Inclusion criteria encompassed patients aged 18 years and above, diagnosed with T2DM, and willing to participate voluntarily. Exclusion criteria comprised patients diagnosed with Type 1 Diabetes Mellitus or other types of diabetes, those with severe cognitive impairment, individuals with acute medical conditions, and those unwilling or unable to provide informed consent.

Study Instrument

The study instrument comprised five sections designed for data collection. The first section involved a demographic data sheet aimed at gathering information about participants, including gender, age, education, marital status, occupation, place of residence, and health status. The second section focused on assessing QOL using the WHOQOL Survey. This self-report questionnaire, known as WHOQOL-BREF, evaluates four domains of QOL: physical health, psychological well-being, social relationships, and environmental factors. With 26 questions in total, the questionnaire employs a five-point Likert scale for responses. Notably, the first two questions pertain to General QOL and General Health and

do not contribute to the domain scores. The reliability and validity of scores were confirmed by the psychometric characteristics of the questionnaire, with a Cronbach's alpha coefficient exceeding 0.72 for all four domains (Van Esch et al., 2011). Assessment of self-efficacy in diabetes management was conducted using the Diabetes Management Self-Efficacy Scale for type 2 diabetes (DMSES), a 20-item questionnaire. To evaluate diabetes self-management, the Diabetes Self-Management Questionnaire (DSMQ) was employed. The DSMQ-R, a 16-item questionnaire divided into subscales of glucose management, dietary control, physical activity, and healthcare utilization, was designed by Schmitt. Notably, the questionnaire includes nine negatively framed items and seven positively framed items. Finally, cumulative diabetes (HbA1c) tests were utilized to assess participants' blood sugar levels and response to therapy. The normal range for HbA1c levels is typically between [4] to [6.2%]. However, for the purpose of this analysis, recent values were utilized. The research tool and its components were piloted following a rigorous process. First, all measurement scales utilized in the study underwent translation into Arabic and experienced meticulous review by field experts to verify their validity. Furthermore, reliability was evaluated using Cronbach's alpha test. The results of this assessment yielded the following Cronbach's alpha coefficients for the WHOQOL-BREF, DMSES, and DSMQ-R scales: 0.78, 0.81, and 0.86 respectively.

Data Collection

The study was approved by the Institutional Review Board (IRB) of three hospitals. Informed consent was obtained from all participants before their inclusion in the study, and confidentiality of their personal information was strictly maintained throughout the research process. Then, the purpose of the study was explained to the directors of hospitals as well as the study participants. Printed and electronic copies of the questionnaire were prepared and distributed to patients in each department, and provided half an hour for completion. Data collection ran from 1 February to 15 May 2023. All questionnaires were collected and prepared for introduction to the statistical analysis SPSS software ver. 28.

Ethical Considerations

Prior to commencement, this study received ethical approval from both the Institutional Council of University and the Ethics Committee of the Ministry of Health. Correspondence was issued to the directors of the participating hospitals, outlining the procedures for data collection. Patients were assured of their voluntary participation and informed of their right to withdraw from the study at any point, as stipulated.

Data Analysis

The categorical data were expressed in frequency and percentages while the scale data expressed in Mean and standard deviation the Pearson correlation was used to explore correlation between self-efficacy, self-care behaviors, glycaemic control with QOL, and the multiple-linear regression test was used to predict QOL dimensions. SPSS Statistics version 28 software was used to analyze data. This version, released by IBM, likely includes various statistical procedures and tools for data analysis, such as descriptive statistics, inferential statistics (e.g., t-tests, ANOVA, regression analysis), data visualization, and more. Additionally, setting the p-value at 0.05 indicates the significance level chosen for hypothesis testing, with results below this threshold considered statistically significant.

Results

A total of 204 diabetic patients, predominantly males, residing in Al-Karak city, and with a mean age of 60.0 years, were enrolled in the study. The majority were married, unemployed, and had a low level of education. Many also had cardiovascular diseases, and most exhibited poor disease control, as indicated by a mean HbA1c of 8.8. See Table 1.

Quality of Life Level among Jordanian Patients with T2DM

Table 2 demonstrated that Social health has the highest mean score of 55.11, indicating that patients perceive their social well-being more positively compared to other domains. The Moderate Mean Scores was for environmental health follows closely with a mean score of 56.48, indicating moderate perceptions of the environmental factors influencing QOL. The psychological health has the lowest mean score of 49.60, suggesting that patients may have comparatively lower perceptions of their psychological well-being. Additionally, the total QOL score has a moderate mean of 52.39, reflecting an overall moderate perception of QOL among Type 2 Diabetic Patients.

Self-Care Behaviors Level among Jordanian Patients with T2DM

The assessment of diabetic patient self-care levels utilized the DSMQ, which encompasses four key dimensions: glucose management, dietary control, physical activity, and healthcare utilization. The total score of the scale was computed based on responses across these dimensions. Subsequently, individual dimension scores were converted to a scale of 10 in accordance with the tool's guidelines. A score below 6.0 indicates suboptimal self-care, as detailed in Table 3.

Table 1. The Socio-Demographic Profile of Type 2 Diabetic Patients.

Variables	Categories	Frequencies	Percentages
Gender	Males	98	48.0
	Females	106	52.0
Residence (City)	Al-Karak	103	50.5
	Ma'an	62	30.4
	Al-Tafla	39	19.1
Occupation	Public	53	26.0
	Private	33	16.2
	Unemployed	118	57.8
Marital status	Married	139	68.1
	Single	18	8.8
	Divorced	10	4.9
	Widowed	37	18.1
Educational level	Secondary	123	60.2
	Diploma	34	16.7
	Bachelor	40	19.6
	Higher studies	7	3.5
Social support source	Spouse	40	19.6
	Family	146	71.6
	Friends	8	3.9
	None	10	4.9
Health education sessions attendance	Yes	45	22.1
	No	159	77.9
Chronic diseases	Cardiovascular	113	55.4
	Kidney	11	5.4
	Respiratory	37	18.1
	Orthopedics	13	6.4
HbA1c	8.86±2.0		
Targeted HbA1c	≤6.5	25	12.3
	>6.6	179	87.7
Age	60.13 ± 8.2		
Monthly income /JOD	497.5 ± 105.5		

Table 2. Perceived Quality of Life Across Domains: Among Patients with T2DM.

WHOQOL-brief	Number of items	Mean	Std. Deviation
Physical health	7	50.63	18.03
Psychological health	6	49.60	13.52
Social health	3	56.48	17.54
Environmental health	8	55.11	20.68
Total quality of life score	26	52.39	14.16

Transformed scale = (raw score-lowest possible score)/possible raw score*100. T2DM=Type 2 Diabetes Miletus.

Self-Efficacy Level among Jordanian Patients with T2DM

The DMSES used to assess their self-efficacy, the higher score indicating higher self-efficacy. The results indicated that the patients' self-efficacy was found to be (5.73 ± 1.56) reflecting they had low self-efficacy level.

Table 3. Self-Management Levels: Among T2DM Patients.

Diabetes self-management level	Number of items	Mean	Std. Deviation
Glucose management	5	5.81	1.99
Dietary control	4	4.89	1.64
Physical activity	3	4.82	1.93
Healthcare use	3	5.29	1.64
Total diabetes self-management score	16	5.26	1.18

Transformed scale = (summed dimension's items score) /max possible summed items *10. T2DM=Type 2 Diabetes Miletus.

Correlation Between the Quality of Life and Self-Efficacy, Self-Care Behaviors, and Glycemic Control in Patients with Type 2 Diabetes Mellitus

A Pearson product-moment correlation analysis revealed significant positive correlations ($p < .05$) between all dimensions of QOL and the total scale score with domains of diabetes self-management and the self-efficacy scale (Table 4).

Predictive Factors for T2DM Jordanian Patients' Quality of Life

To examine the significant predictors for T2DM patients' QOL, a backward multiple-linear regression analysis was used, the best significant predictors with p-values below 0.05 are found in the final model, and the demographic information for T2DM patients was added to the regression model. Five backward multiple-linear regressions were then generated.

Predictors for Quality of Life (Physical Health Dimension)

Table 5 demonstrated that the final model of backward multiple-linear regression yielded a significant ANOVA results $F(12,191)=7.732p<.001$ with 12 variables have left over in the final model and explained $\text{adj } R^2 = 26.7\%$ of physical health QOL variation, the female patients demonstrated a lower physical health score than male patients by ($B = -5.792$, $p = .010$). Renal, cardiovascular, respiratory, and divorced patients had lower physical health QOL scores than other patients ($B = -11.556$, -2.70 , $6-7.832$, and -13.616 ; $p0.05$). The physical health score would probably decline by ($B = -0.327$, $p = .003$ and $B = -2.614$, $p = .005$) unit and unit correspondingly as the patients' age and HbA1c increased by 1 year and one unit, respectively. On other side, those who live in Ma'an city over Al-Karak city, those who have public and private occupation over those not working were found to have higher physical health score ($B = 5.196$, $p = .033$, $B = 7.928$, $p = .015$ and $B = 9.763$

Table 4. Correlation Between the Quality of Life and Self-Efficacy, Self-Care Behaviors, and Glycemic Control in Patients with Type 2 Diabetes Mellitus.

WHOQOL-brief	Test value	Glucose management	Dietary control	Physical activity	Healthcare use	Total diabetes self-management score	Self-efficacy	Glycemic control HbA1c
Physical health	r	.174	.202	.237	.182	.229	.346	-.258
	p	.013	<.001	<.001	.007	<.001	<.001	<.001
Psychological health	r	.250	.190	.238	.202	.307	.282	-.201
	p	<.001	.007	<.001	.002	<.001	<.001	<.001
Social health	r	.298	.264	.192	.226	.374	.335	-.125
	p	<.001	<.001	<.006	.001	<.001	<.001	.046
Environmental health	r	.306	.241	.233	.212	.357	.416	-.200
	p	<.001	<.001	<.001	<.001	<.001	<.001	<.001
Total quality of life score	r	.300	.207	.263	.189	.360	.407	-.222
	p	<.001	.003	<.001	.005	<.001	<.001	<.001

Table 5. Predictors for Quality of Life (Physical Health Dimension).

Final model	Coefficients			
	B	Beta	t-value	p-value
Gender (females)	-5.792	-.168	2.601	.010
Chronic diseases (renal)	-11.556	-.160	2.378	.019
Chronic diseases (cardiovascular)	-2.706	-.243	2.994	.003
Chronic diseases (respiratory)	-7.832	-.171	2.434	.016
Marital status (divorced vs. married)	-13.616	-.162	2.500	.013
Age in years	-0.327	-.270	3.009	.003
HbA1c level	-2.614	-.240	2.874	.005
Place of living (Ma'an city vs. Al-Karak)	5.196	.141	2.145	.033
Occupation (public vs. not working)	7.928	.205	2.461	.015
Occupation (private vs. not working)	9.763	.216	2.694	.008
Self-care behaviors score	2.819	.253	3.731	.001
Self-efficacy score	2.903	.261	3.867	.001

$F(12,191) = 7.732, p < .001$. $R^2 = 23.5\%$, $adj R^2 = 26.7\%$.

$p = .008$), respectively. Further, the patients' physical health score would likely to increase by ($B = 2.819$, $B = 2.903$, $p < .001$) unit for every additional one score of patient's self-care behaviors and self-efficacy.

Predictors for Quality of Life (Psychological Health Dimension)

In the analysis ($F(7,196) = 10.095$, $p < .001$), female diabetic patients exhibited a significantly lower quality of psychological health compared to male patients ($B = -4.122$, $p = .017$). Additionally, individuals with comorbidities such as renal and cardiovascular diseases, as well as those with high HbA1c levels, reported lower psychological health scores compared to

Table 6. Predictors for Quality of Life (Psychological Health Dimension).

Final model	Coefficients			
	B	Beta	t-value	p-value
Gender (females)	-4.122	-.158	2.416	.017
Chronic diseases (renal)	-10.464	-.191	2.867	.005
Chronic diseases (Cardiovascular)	-3.627	-.139	2.050	.042
HbA1c level	-4.377	-.126	2.921	.002
Access information (yes)	3.858	.142	2.128	.035
Self-care behaviors score	3.014	.277	4.184	.001
Self-efficacy score	2.821	.259	3.782	.001

$F(7,196) = 10.095, p < .001$. $R^2 = 26.5\%$, $adj R^2 = 23.5\%$.

those without such conditions ($B = -10.464$, $B = -3.627$, and $B = -4.377$, respectively, $p < .05$). Refer to Table 6 for details.

Predictors for Quality of Life (Social Health Dimension)

In the final model ($F(6,197) = 17.447$, $p < .001$, with $adj R^2 = 32.4\%$ of variance explained), six variables were retained. Patients residing in Al-Tafila city, as opposed to Al-Karak city, demonstrated lower social health scores ($B = -9.566$, $p = .004$). Divorced patients, compared to married individuals, and those with renal and cardiovascular diseases, reported lower social health scores ($B = -17.236$, $B = -13.819$, and $B = -6.481$, respectively, $p < .05$). Furthermore, an increase in social health QOL was expected for patients living in Al-Tafila city ($B = 8.056$, $p = .003$) and those with renal diseases ($B = 6.218$, $p = .001$). Refer to Table 7 for details.

Predictors for Quality of Life (Environmental Health Dimension)

Six predictors significantly impacted patients' environmental health QOL, $F(6,197) = 14.447$, $p < .001$, with an adjusted R^2

Table 7. Predictors for Quality of Life (Social Health Dimension).

Final model	Coefficients			
	B	Beta	t-value	p-value
Place of living (Al-Tafila city vs. Al-Karak)	-9.566	-.178	-2.903	.004
Marital status (divorced vs. married)	-17.236	-.172	-2.785	.006
Chronic diseases (renal)	-13.819	-.160	-2.571	.011
Chronic diseases (cardiovascular)	-6.481	-.158	-2.486	.014
Self-efficacy score	8.056	.188	2.995	.003
Self-care behaviors score	6.218	.363	5.851	.001

$F(6,197) = 17.447, p < .001$. $R^2 = 34.7\%$, $adj R^2 = 32.4\%$.

Table 8. Predictors for Quality of Life (Environmental Health Dimension).

Final model	Coefficients			
	B	Beta	t-value	p-value
Chronic diseases (renal)	-13.379	-.183	2.881	.004
HbA1c level	-2.365	-.162	2.094	.038
Monthly income	1.106	.138	1.988	.047
Self-efficacy score	3.294	.292	3.867	.001
Self-care behaviors score	2.137	.147	2.525	.029
Access information (yes)	5.183	.142	2.109	.036

$F(6,197) = 14.447, p < .001$. $R^2 = 30.6\%$, $adj R^2 = 28.7\%$.

of 28.7%. Analysis in Table 8 reveals that renal diseases and high HbA1c levels correlated with decreased environmental health scores ($B = -13.379$, $p = .004$ and $B = -2.365$, $p = .038$, respectively). Conversely, environmental health QOL is expected to increase by 1.106 units for every additional JOD of monthly income, 3.294 units for each additional score of self-efficacy, 2.137 units for each additional score of self-care, and 5.183 units for individuals accessing information via the internet.

Predictors for Quality of Life (Total Quality of Life Score)

ANOVA model showed that there were nine variables showed their predictive power on total QOL scale score $F(9.194) = 12.443, p < .001$ and they collectively explained $adj R^2 = 34.1\%$ of patients' QOL variance; the results have demonstrated that being a female, divorced and having renal diseases were associated with lowering the total QOL by ($B = -3.952$, $B = -9.303$ and $B = -13.202$ unit, $p < .05$) for all. Additionally, for one additional unit of patients' HbA1c and for additional one year of patient's age, the total QOL would decrease by ($B = -11.190$ and $B = -4.944$ unit, $p < .05$) for all.

On opposite direction, those able to access information through using internet exhibited higher QOL score than who unable ($B = 4.194$, $p = .026$), besides the total QOL score would expect to increase by ($B = 3.206, p = .012$) unit for additional one JOD/month, ($B = 2.053$, $p = .002$ and $B = 1.918$, $p = .026$) for one additional unit of patient's self-efficacy and self-care behaviors score.

Discussion

The findings of the present study indicate that individuals diagnosed with T2DM exhibit diminished self-efficacy scores pertaining to diabetes management. This decline in self-efficacy directly impacts their overall QOL, as evidenced by a negative correlation between self-efficacy levels and QOL. Conversely, a positive relationship exists between self-efficacy and QOL, suggesting that higher levels of self-efficacy are associated with improved QOL among individuals with T2DM. Moreover, interventions spanning more than 6 months demonstrate particularly promising outcomes in enhancing self-efficacy and subsequently elevating the QOL in this patient population (Kong et al., 2019). While certain studies suggest that patients with T2DM experience a diminished QOL, with no significant correlation found between self-efficacy and QOL (Huayanay-Espinoza et al., 2021), others have identified a positive relationship between self-efficacy and QOL among individuals with T2DM (Knowles et al., 2020). Moreover, some researchers have emphasized the importance of educational interventions in enhancing the QOL by modifying self-efficacy behaviors among patients with T2DM. This underscores the existence of a positive correlational relationship between self-efficacy and QOL (Abu-Shennar & Bayraktar, 2022).

The current study demonstrates a positive correlation between self-care and the QOL in patients with T2DM. We observed low self-care practices among participants, resulting in a lower QOL. Specifically, in the Arab region, particularly in Saudi Arabia, there exists a positive relationship between self-care and QOL. This indicates that higher levels of self-care behaviors contribute to an improved QOL among T2DM patients (Alshayban & Joseph, 2020). Emphasizing the significance of health literacy, educating patients on lifestyle modifications, and enhancing self-care empowerment are crucial. It has been noted that when patients engage in low self-care activities, their QOL tends to be moderate in certain studies (Gholizadeh et al., 2022). There is a pivotal role for self-care practices that bolster the QOL. Technologies such as smartphones and text messages serve as effective tools in empowering patients and elevating self-care levels, consequently enhancing overall QOL (Aminuddin et al., 2021).

According to the current study findings, increased HbA1C levels among individuals diagnosed with T2DM significantly worsen their QOL by exacerbating complications such as diabetic foot, neuropathy, retinopathy, and nephropathy.

Rossi et al. (2019) have identified a clear negative link between HbA1C levels and QOL. Additionally, hypoglycemia resulting from fluctuating blood glucose levels poses a substantial threat to QOL. Therefore, it is crucial for patients to effectively manage their blood glucose levels (Wu et al., 2021; Svedbo Engström et al., 2019). These three factors collectively impact the overall QOL. Enhanced self-efficacy and adherence to self-care practices are associated with better QOL outcomes. Consequently, elevated HbA1C levels can lead to the development of long-term complications such as diabetic foot, retinopathy, nephropathy, neuropathy, among others. The present research specifically investigated these three factors and their influence on the QOL of individuals with type 2 diabetes. Although recent studies exploring these interconnected variables were scarce, the current study findings offer valuable insights that complement existing literature, thus holding significant implications for clinical practice and future research endeavors.

Physical Predictor

Despite limited research on the correlation between physical factors and the QOL among T2DM patients, existing studies suggest that various factors significantly impact patients' well-being. Factors such as age, disease duration, blood glucose levels, and medication availability are crucial in managing the QOL for T2DM patients (Gebremedhin et al., 2019). Additionally, indicators such as diabetic foot conditions, smoking habits, energy levels, obesity, and mobility are recognized as important determinants of QOL in T2DM patients. These indicators often signal poor QOL and can lead to complications and other health issues (Khunkaew et al., 2019).

A Psychological Predictor

T2DM is a chronic disease and chronic diseases are usually accompanied by complications on the psychological side of patients, it has been found that T2DM patients have high rates of depression, anxiety, and stress, which is reflected in their QOL negatively (Alzahrani et al., 2019). Stress levels and the time of diagnosis of patients with T2DM were considered as psychological predictors that have a role in the occurrence of depression cases, which in turn leads to a weakness in the psychological aspects of patients and a decrease in their QOL (Martino et al., 2019). The role of psychological distress such as alexithymia is a closely linked to the poor QOL among patients with T2DM (Martino et al., 2019). The association of anxiety with the QOL, as many results of studies have indicated, is considered a negative relationship, the greater the anxiety causes lower the QOL of T2DM patients, the cognitive, psychological and emotional function has a role in improving or reducing the QOL to those patients (Babenko et al., 2019).

Socioenvironmental Predictors

The current study revealed that social factors significantly impact the QOL of patients. For instance, religious beliefs contribute to better adaptation to the disease and medication adherence (Saffari et al., 2019). Additionally, factors such as sex, age, marital status, and diabetes-related complications serve as predictors of QOL for T2DM patients. While these factors moderately enhance QOL according to some studies (Zare et al., 2020), T2DM patients using insulin injections tend to experience better QOL than those using oral agents. This is attributed to their enhanced knowledge about diabetes and improved medication adherence (Gillani et al., 2019).

Implications

The current study has several implications. Firstly, it could establish a foundation for future research in southern Jordan concerning T2DM patients. The study highlights various health issues linked with diabetes, such as amputations, neurological complications, and cardiovascular diseases, providing insight into the condition of T2DM patients in Southern Jordan. Additionally, the study suggests conducting qualitative research in the future to allow participants to express their experiences with the disease and its complications, providing a deeper understanding of their lifestyle and habits. Furthermore, the results could aid medical authorities in organizing educational and training programs, rehabilitating patients, and integrating them into society with a better understanding of the disease. Finally, the study might prompt health policymakers to develop new policies for the care of T2DM patients.

Limitations

Several challenges were encountered. Firstly, community awareness about research and its significance in clinical decision-making posed a major obstacle. Many patients declined participation due to concerns about intrusion into their health and economic circumstances. Secondly, while diabetes has been extensively researched, particularly in the Middle East and specifically in Jordan, our study found limited exploration of certain factors. Lastly, sample collection at one Hospital, despite its modern facilities, often lacked suitable participants for our study's objectives.

Conclusion and Recommendation

The current study revealed that individuals with T2DM in southern Jordan face inadequate care, low self-efficacy, and struggle with controlling HbA1c levels, leading to a decline in their QOL and increased risk of complications. Various factors contribute to this situation, including societal culture, customs, misconceptions about the disease, educational levels, and economic factors. Recognizing the prevalence of T2DM

in southern regions and assessing the health status of patients is crucial. The study suggests future interventions should focus on education to correct misconceptions, raise awareness, improve health literacy, provide ongoing patient monitoring, enhance social support, and implement group therapy to foster a sense of competition among patients.

Acknowledgments

The researcher would like to thank the participants for their input in the current study.

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Statements and Declarations

Ethical Consideration

The Institutional Review Board (IRB) of the Isra University- Jordan approved the study (2022/2023/2); dated 15 February 2023.

Author Contributions/CRedit

FSH and MOAH were involved in literature review. FSH and MOAH designed the study. FSH was involved in data collection. FSH and AA were involved in data analysis. FSH and MOAH were involved in discussion. AA supervised the study. FSH and AA written the manuscript. FSH and AA were involved in critical revisions for important intellectual content.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Data Availability

Data are available on request due to privacy/ethical restrictions.

Supplemental Material

Supplemental material for this article is available online.

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