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Quality of Life for Type 2 Diabetes Mellitus Patients in Kirkuk City: A Cross-Sectional Study

Kerkük Şehrindeki Tip-2 Diabetes Mellitus Hastalarında Yaşam Kalitesi: Kesitsel Bir Çalışma

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Abstract: Objectives: This study aims to assess the quality of life of diabetics living in Kirkuk and the factors affecting it. Methods: This cross-sectional study was carried out in primary care centers in Kirkuk, Iraq, from September 2021 to March 2022. The participants consisted of 150 participants who fulfilled the criteria for participation in the study. Clinical, and sociodemographic data and WHO Brief Quality of Life Scale format were collected from participants. Descriptive analysis, Kolmogorov-Smirnov, and Chi-square tests were used in the study's statistical analysis. Results: The majority of patients were over 59 years, psychological and social indicators scores were found as 52.7±13.8, the mean independence dimension scores were 41.7±11.8, the physical indicator scores were 38.1±12.1, the environmental indicator scores were 14.8±3.8, and finally the spiritual dimension was found as 8.7±6.2. Age, marital status, and quality of life were statistically significant (p=0.001), between income levels and quality of life were significant as p=0.03, and educational levels and quality of life were statistically significant (p=0.001). In addition, there was a statistical correlation between occupation, residence, family type, and smoking with quality of life. Conclusion: To improve the patient's quality of life, it is important to increase family awareness and provide appropriate family support in collaboration with the family in the care and treatment of the patient.
Keywords: Quality of life, Type-2 diabetes mellitus, Iraq.

Öz: Amaç: Kerkük'te yaşayan tip-2 diabetes mellitus hastalarının yaşam kalitesini ve bunu etkileyen faktörleri değerlendirmektir. Gereç ve Yöntem: Bu kesitsel çalışma, Eylül 2021'den Mart 2022'ye kadar Irak'ın Kerkük kentindeki birinci basamak bakım merkezlerinde gerçekleştirildi. Çalışma örneklemini çalışmaya katılma kriterlerini yerine getiren 150 adet katılımcı oluşturmuştur. Katılımcılardan sosyodemografik ve klinik veriler ile Dünya Sağlık Örgütü Kısa Yaşam Kalitesi Ölçeği toplanmıştır. Çalışmanın istatistiksel analizinde tanımlayıcı analizler, Kolmogorov-Smirnov ve Ki-kare testi kullanıldı. Bulgular: Hastaların çoğunluğu 59 yaş üstündeydi (%38,7), en yüksek mesafe psikolojik ve sosyal göstergeleri ile 52,7±13,8, ortalama bağımlılık boyutu puanı 41,7±11,8, ortalama fiziksel gösterge boyutu 38,1±12,1, ortalama boyut çevresel gösterge 14,8±3,8, en düşük ortalama manevi boyut 8,7±6,2 idi. Yaş ve yaşam kalitesi arasında (p=0,001), medeni hal ile yaşam kalitesi arasında (p=0,001), gelir ile yaşam kalitesi arasında (p=0,039), eğitim düzeyi ile yaşam kalitesi arasında (p= 0,001) istatistiksel olarak anlamlı ilişkiler saptandı. Sonuç: Hastanın yaşam kalitesini artırmak amacıyla aile bilincinin artırılması ve hastanın bakım ve tedavisinde aile ile iş birliği içinde uygun aile desteğinin sağlanması yaşam kalitesinin artırılması sağlayabilir.
Anahtar Kelimeler: Yaşam kalitesi, Tip-2 diabetes mellitus, Irak.

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Introduction

Diabetes mellitus (DM) is a chronic metabolic disorder that causes hyperglycemia. DM results in long-term damage and disorders in certain organs and tissues (American Diabetes Association, 2009). Despite two major forms of DM (Type-1 and type-2), DM can appear to different factors such as genetic problems, toxicity, gestation, and insulin receptor disorders (American Diabetes Association, 1997). Currently, diabetes is mainly classified into Type-1 diabetes mellitus (T1DM), Type-2 diabetes mellitus (T2DM), gestational diabetes, and other less common types such as monogenic diabetes (American Diabetes Association, 2020). Type-2 DM, the most common type in this classification, is a chronic disorder characterized by impaired glucose uptake, altered glucose-induced insulin secretion, and increased hepatic glucose production leading to hyperglycemia (García-Chapa, Leal-Ugarte, Peralta-Leal, Durán-González and Meza-Espinoza, 2017).

Obesity, which has gained great momentum in recent years, together with physical inactivity has been the main factor in the increase in the number of patients with T2DM in the world (Chatterjee, Khunti and Davies, 2017). In 2015, it was estimated that 415 million people had T2DM. Considering that lockdowns during the COVID-19 pandemic have also increased physical inactivity, it will not be surprising to think that the number of T2DM patients will increase excessively in future projections (Chatterjee et al., 2017).

Prevention of T2DM is very crucial to reduce the use of long-term medication to eliminate the complications caused by T2DM and to improve the general well-being of the person. At this point, diet and exercise recommendations are known to be important factors in the prevention of T2DM (Merlotti, Morabito and Pontiroli, 2014).

Quality of life (QoL) can be briefly defined as general satisfaction with life (Moons, Budts and De Geest, 2006). However, QoL is also known as a multidimensional concept (Rubin and Peyrot, 1999). These dimensions include general well-being, future physical health, and functionality, mental health, satisfaction with treatment, and social functionality. T2DM is known to have negative mental and physical effects on QoL. Diabetic complications such as diabetic peripheral neuropathy, body pain, foot ulcers, and even amputations affect QoL (Riandini et al., 2018). In addition to poor quality of life, patients with T2DM have higher health expenditures than healthy people (Qin et al., 2020).

Based on the above, this study aimed to measure the QoL levels of patients with T2DM living in the Kirkuk province of Iraq. There has not been any previous study in which QoL levels of Iraqi patients with T2DM were measured.

Methods

This descriptive cross-sectional study was conducted between September 9th, 2021, and March 30th, 2022, at Tisein Health Center, Hajjaj Health Center, Al-Wasiti Health Center, Rezkari Health Center, and Altaakhi Health Center. The ethical approval required for the current study was obtained from the Health Department of Kirkuk province, Republic of Iraq (2021021, 10/17/2021). 244 patients were invited to participate, and 150 patients agreed to participate in this study.

The questions asked to the participants were given in a form in 4 parts. Part 1 consisted of a 10-question form to learn socio-demographic information (age, gender, marital status, education status, occupation, economic status, residence, type of family, smoking, body mass index), while the second part included 6 questions about medical history. In Part 3, 4 questions were asked about COVID-19 disease history and finally, in Part 4, questions from the Arabic version of the World Health Organization Quality of Life Instrument (WHOQOL-BREF) form were asked. The Arabic version of WHOQOL-BREF has a 26-item scale (Ohaeri and Awadalla, 2009). Response options range from 1 (Very Dissatisfied/Very Bad) to 5 (Very Satisfied/Very Good). The scale consists of four sub-dimensions: a physical indicator consisting of 5 elements (sleep, nutrition, completion of duties, pain, and discomfort) the answers ranged from always=3, sometimes=2, to never=1. The second dimension, the psychological and social aspects, consists of 9 elements (sexual activities, relationship with family and friends, mood, focus, memory and learning, concentration, self, fear, and anxiety). The third dimension of independence consists of 4 elements (daily life activities, movement, medicines, and health care). The fourth dimension consists of 8 sub-elements, and the fifth dimension consists of two components (spiritual beliefs, hope, and the future). The answers range from always=3, sometimes=2, to never=1.

Statistical Analysis

Analysis of the data in the study was obtained in SPSS (26) and to determine whether the objectives of the study were achieved, the normal distribution was tested using Kolmogorov-Smirnov and for comparisons between groups. Descriptive analysis (frequencies, percentages, mean) and chi-square were used to evaluate the data, and the results were considered highly significant. The level of significance to be determined in assessing the data was $p < 0.05$.

Results

Sociodemographic Results

Sociodemographic characteristics of T2DM patients are presented in Table 1 and accordingly, 38.7% of participants in the age group (>59 years) and 34% of participants in the age group (50-59) stand out as two large groups. 29 participants in the (40-49 age), 4 participants in the (30-39 age), and finally 8 participants in the (20-29 age) were in these groups. Most of the participants (70%) are males and married (91.3%). As for the educational level, the largest number of them were middle school graduates, who constituted (39.3%) of the participants, and 14% were intermediate graduates. It was also seen that 6% of the participants had a master's degree and 4.7% had a Master's/Ph.D. degree. On the other hand, 14% of the participants stated that they could not read and write, while 9.3% stated that they could read but could not write.

As for the occupation of the participants, the largest number of them were public servants (34.7%), The other two important segments were retired (22.7%) and housewives (18%), respectively. Afterward, the respondents are listed as unemployed (11.3%), self-employed (8.7%), and others (4.7%). 58% of the participants described their financial situation as "enough to some extent", while 32.7% described it as "enough". 14 participants indicated that their financial situation was insufficient. Almost all the participants lived in cities, while only 7 participants stated that they lived in villages. 64% of the participants stated that they live as an extended family and 36% as a single family. In addition, three out of every four participants were smokers. As for body mass index (BMI), all participants were above normal weight.

Table 1: Sociodemographic Characteristics of Participants

Variables		n	%
Age	20-29	8	5.3
	30-39	4	2.7
	40-49	29	19.3
	50-59	51	34
	>59	58	38.7
Gender	Female	45	30
	Male	105	70
Marital status	Single	13	8.7
	Married	137	91.3
Level of education	Illiteracy	21	14
	Read and does not write	14	9.3
	Elementary graduate	19	12.7
	Intermediate graduate	21	14
	Middle school graduate	59	39.3
	College or Bachelor graduate and Ph.D.	16	10.7
Occupation	Public servant	52	34.7
	Unemployed	17	11.3
	Retired	34	22.7
	Housewife	27	18
	Self-employed	13	8.7
	Other	7	4.7
	Enough	49	32.7
Economic status	Enough to some extent	87	58
	Not enough	14	9.3
	Town	143	95.3
Residence	Village	7	4.7
Type of family	Single-family	54	36
	Extended family	96	64
Smoking	Yes	113	75.3
	No	37	24.7
BMI	BMI < 25.00	none	none
	BMI 25.00-27.49	57	38.1
	BMI 27.50-29.99	88	54.7
	BMI 30.00-39.99	5	3.3
Total		**150**	**100**

Medical History of Patients

The number of participants who stated that they were diagnosed with diabetes between 4-6 years was 36.7%, while the number of participants diagnosed for more than 10 years was 35. The percentage of participants diagnosed between 7-9 years and 1-3 years were 22% and 18%, respectively. The participants were asked whether they had other chronic diseases and symptoms besides this disease and 43.3% of the participants stated that they had secondary diseases. Hypertension was the most emphasized disease. When the treatment methods used by individuals with the disease were learned, it was seen that more than half of the participants (56%) used anti-diabetic drugs (oral pills). In comparison, a smaller proportion (21.3%) used insulin injections in addition to oral pills. Nutritional control was considered as a treatment

modality by 12% of the participants, whereas 16 patients were treated with insulin alone (Table 2).

Table 2: Patients' T2DM History and Medication

	Variables	n	%
The duration of diabetes	1-3 years	27	18
	4-6 years	55	36.7
	7-9 years	33	22
	>10	35	23.3
Other diseases	Yes	65	43.3
	No	85	56.7
If the answer is yes; mention the disease	Blood pressure and kidney disease	5	3.3
	Leg amputation	2	1.3
	Permanent sensitivity	7	4.7
	Apoplexy	4	2.7
	Hypertension	43	28.7
	Kidney disease	4	2.7
Type of treatment for diabetes	Diet only	18	12
	Oral anti-diabetic drugs (pills)	84	56
	Oral anti-diabetic drugs (pills) + insulin	32	21.3
	Insulin only	16	10.7

Infected Patients with COVID-19

It was determined that most of the participants (56.7%) were not infected with COVID-19 and (64.7%) had received COVID-19 vaccination.7 participants were infected after receiving the vaccine.

Most of the participants that received the vaccine were from the type of Pfizer (USA), where they constituted (58.7%). The rest took AstraZeneca (British), where they constituted (4.5%) of the participants (Table 3).

Table 3: Infection Status with COVID-19 for Participants

	Variables	n	%
COVID-19 infection	Yes	65	43.3
	No	85	56.7
COVID 19-vaccine	Yes	97	64.7
	No	53	35.3
The type of vaccine taken	Pfizer (USA)	88	58.6
	AstraZeneca (British)	9	4.5
	Chinese Sinopharm	0	0

Quality of Life Questionnaire

Table 4 shows the distribution of the participant's scores on "quality of life for type 2 diabetes patients who attend primary health care centers in the city of Kirkuk" and its sub-dimensions. The QoL showed that most of the participants was the sub-dimension in quality of life psychological and social indicators 52.7±13.8 is the highest and then the "Independence" sub-dimension alined as 41.7±11.8, then Physical indicator as 38.1±12.1, followed by

Environmental indicator as 14.8±3.8 and the lowest score was for the Spiritual indicator sub-dimension as 8.7±6.2.

Table 4: Distribution of the Scores of the Research Group on "Quality of Life for Type 2 Diabetes Patients Who Attend Primary Health Care Centers in Kirkuk City" and Its Sub-dimensions (n = 150)

Multidimensional Scale of QOL	Min.	Max.	Mean (SD)
Physical indicator	19	57	38.1±12.1
Psychological and social indicators	27	69	52.7±13.8
Independence	22	60	41.7±11.8
Environmental indicator	6	18	14.8±3.8
Spiritual indicator	4	31	8.7±6.2

The distribution of QoL scores according to some sociodemographic characteristics of T2DM patients was shown. Age parameters were examined and the mean QoL score was 54.6±10.9 for the age group >59 years, 32.6±8.8 for the age group 50-59, 41±5.3 for the age group 30-39 years, 30±9.2 for the age group 40-49 years and younger, 27±5.4 for the age group 20-29 years, respectively and for different age groups the difference, there was statistical significance (p=0.001). When gender was examined, the mean QoL score was found to be 41.7±12.9 for females and 39.5±10.6 for males, and the difference between the mean scores was not statistically significant (p=0.341). The mean QoL score was 36.3±11.2 in married participants and 31±8.7 in single participants, and the difference between the mean scores was statistically significant (p=0.001). The mean QoL score for patients was 54.33±7.8 for "higher than expenditures" and the difference between the mean score was statistically significant (p=0.032). When patients' educational level in QoL was examined, the highest mean score was 51.3±7.31 for college graduates or undergraduates, the difference between mean scores was statistically significant (p=0.001).

The mean QoL score varied according to occupational categories. The mean score was 48±6.5 for the self-employed, 43.1±9.3 for the civil servant, 39.7±6.4 for the housewife, 38±10.3 for the retired, 30.1±9.1 for the unemployed, and the lowest average score was 15.3±3.31 for the other, respectively and the difference between the mean score was statistically significant (p=0.001). When the economic situation was analyzed in terms of QoL, the mean score for "enough to some extent" was 35.4±10.2, the mean score for "not enough" was 28±5.12, and the lowest mean score was 27±6.5 for "enough", respectively. The difference between mean scores was not statistically significant (p=0.454). Additionally, when examining residences in terms of QoL, mean QoL scores were 53±7.6 for village residents and 34.3±5.8 for residents. The difference between mean scores was not village scores and the mean score was statistically significant (p=0.009).

Table 5: The Distribution of QoL for Diabetic Patients and the Degrees of Sub-dimensions According to Some Characteristics

Variables		QoL Total Score X ± SD	X^2	df	p-value
Age	20-29 years	27± 5.4	0.00	84	**.001***
	30-39 years	41± 5.3			
	40-49 years	30± 9.2			
	50-59 years	32.6± 8.8			
	>59 years	54.6± 10.9			
Gender	Female	41.7± 12.9	0.87	21	0.341
	Male	39.5± 10.6			
Marital status	Single	31.0± 8.7	0.00	21	**0.001***
	Married	36.3± 11.2			
Income	Lower than expenditures	48.17± 3.57	2.93	1	**0.032***
	Equal expenditures	51.95± 8.91			
	Higher than expenditures	54.33± 7.80			
Level of education	Illiteracy	43.1± 9.3	0.00	126	**0.001***
	Read and do not write	30.1± 9.1			
	Elementary graduate	38.0± 10.3			
	Intermediate graduate	39.7± 6.4			
	Middle school graduate	48.0± 6.50			
	College or Bachelor graduate and Ph.D.	51.3± 7.31			
Occupation	Public servant	43.1± 9.3	0.00	105	**0.001***
	Unemployed	30.1± 9.1			
	Retired	38± 10.3			
	Housewife	39.7± 6.4			
	Self-employed	48.0± 6.50			
	Other	15.3± 3.31			
Economic status	Enough	27± 6.5	0.00	42	0.454
	Enough to some extent	35.4± 10.2			
	Not enough	28± 5.12			
Residence	Town	53± 7.6	0.00	21	**0.001***
	Village	34.3± 5.8			
Type of family	Single-family	38± 5.12	0.00	21	**0.001***
	Extended family	58.1± 12.1			
Smoking	Yes	55.3± 14	0.04	19	**0.001***
	No	34.7± 13.5			

When the family type variable was analyzed, the mean score was 58.1±12.1 and the mean score for the extended family was 38±5.12 and the difference between the mean single-family scores and mean scores was statistically significant (p=0.001). Finally, when examining the smoking variable in the QoL of the participants, the mean score was 55.3±14 for smokers and 4.7±13.5 for non-smokers, and the difference between the mean scores was statistically significant (p=0.001) (Table 5).

Discussion

It is a known fact that chronic diseases affecting certain or all parts of the body harm all socioeconomic classes. Individuals with chronic diseases have low skills in disease management because of low self-efficacy. As a result, the control of chronic diseases becomes

difficult, and the quality of life decreases accordingly (Chan, 2021). T2DM is also one of the major chronic diseases affecting humanity globally. It is known that there are many studies examining the relationship between T2DM and quality of life and systematic analysis of these studies (Jing et al., 2018). In line with these data, the present study aimed to evaluate the quality-of-life levels in Iraqi T2DM patients.

Inspiring this study, there are many studies in other countries describing the relationship between T2DM and QoL (Barua, Faruque, Chowdhury, Banik and Ali, 2021; Jing et al., 2018; Zurita-Cruz, Manuel-Apolinar, Arellano-Flores, Gutierrez-Gonzalez, Najera-Ahumada and Cisneros-González, 2018). The data of the present study are compared with other studies examining the relationship between sociodemographic data and QoL in patients with T2DM and according to the relationship between the gender parameter and QoL, it was observed that women had higher values. However, there was no statistically significant difference. Other studies have supported that woman participants with T2DM have a higher QoL (Zurita-Cruz et al., 2018). However, there are other studies in which male participants had a higher QoL (Abedini, Bijari, Miri, Emampour and Abbasi, 2020). The relationship between participants' marital status and quality of life was taken as a basis, and married participants had significantly higher QoL. Although the reason(s) for this result is difficult to interpret by these authors, there are many studies supporting it (Al Hayek, Robert, Al Saeed, Alzaid and Al Sabaan, 2014; Alsuwayt, Almesned, Alhajri, Alomari, Alhadlaq and Alotaibi, 2021; Wubben and Porterfield, 2005). Similar to Al Hayek et al. (2014), Alsuwayt et al. (2021), and Wubben and Porterfield, (2005), QoL was found to be higher in higher-income participants in this study (Al Hayek et al., 2014; Alsuwayt et al., 2021; Wubben and Porterfield, 2005).

In the relationship between the educational status of the participants and QoL, it was observed that bachelor’s graduates had a statistically significant higher QoL. In support of the results of this study, other studies have shown that the quality of life increases in direct proportion to the level of education increases (Baghianimoghadam, Afkhami, Ardekani and Baghianimoghadam, 2009; Mokhtari, Gheshlagh and Kurdi, 2019). Family type, which is another parameter, has an important place in this study. While the single-family type occupies an important place in Western society, the extended family type constitutes a large part of Eastern society. In line with this statement, most of the participants in this study lived in extended families. In this study, participants living in the extended family had statistically significantly higher QoL values than those in a single family. Thommasen, Berkowitz, Thommasen and Michalos, (2005), found that T2DM patients who live in a small and isolated

group have lower QoL scores than those who live in a family than others. Finally, this study found that the smoking parameter is a variable that makes a difference in the QOL felt by patients as the scores were higher for smokers. Against this study, smoker participants with T2DM had lower QoL scores than non-smokers in the study, of Kiadaliri, Najafi and Mirmalek-Sani, (2013).

Conclusion

The parameters affecting the QoL dimensions of T2DM patients were identified as age, gender, marital status, income, level of education, occupation, type of family, and smoking. The results of the study showed that the QoL provided to T2DM patients from psychological and social indicators, followed by independence, physical indicators, environmental indicators, and finally spiritual indicators.

In line with the results obtained from the research, the following recommendations can be made to improve quality of life. Family awareness can be increased, and appropriate family support should be provided in cooperation with the family in the care and treatment of the patient to increase the quality of life for the patient. Conducting weekly or monthly special programs for T2DM patients increases the QoL provided through these programs.

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