



T.C

**ÇANKIRI KARATEKİN UNIVERSITY
INSTITUTE OF HEALTH SCIENCES
DEPARTMENT OF NURSING**

**FACTORS AFFECTING THE QUALITY OF LIFE OF
PATIENTS WITH DIABETES MELLITUS: A
DESCRIPTIVE CROSS-SECTIONAL STUDY**

Master's Thesis

Harith AHMED MOHAMMED MOHAMMED

Çankırı 2022

**FACTORS AFFECTING THE QUALITY OF LIFE OF PATIENTS
WITH DIABETES MELLITUS: A DESCRIPTIVE CROSS-
SECTIONAL STUDY**

BY

Harith AHMED MOHAMMED MOHAMMED

**Institute of Health Sciences
Department of Nursing**

Internal Medicine Nursing Master's Program with Thesis

The Degree of Master of Science

ADVISOR

Asst. Prof. Dr. Müjgan ONARICI

Çankırı 2022

ACCEPTANCE AND APPROVAL

Harith AHMED MOHAMMED MOHAMMED (student number: 208210207), the graduate student of CAKU's Institute of Health Sciences, has successfully presented his thesis entitled "Factors Affecting The Quality of Life of Patients with Diabetes Mellitus: A Descriptive Cross-Sectional Study" before the jury whose signatures are below, after fulfilling all of the requirements set out by the relevant regulations for the degree of Master of Science:

Thesis Exam Date / 10 /10 /2022

Advisor : Asst. Prof. Dr. Mjgan ONARICI

Members of Examination Committee:

Chairman : Asst. Prof. Dr. Songl ALAR
Department of Nursing
Bolu Abant İzzet Baysal University

Member : Asst. Prof. Dr. Mjgan ONARICI
Department of Nursing
ankırı Karatekin University

Member : Asst. Prof. Dr. Aslı TOK ZEN
Department of Nursing
ankırı Karatekin University

Approved for the Graduate School of Health Sciences

Prof. Dr. zcan zkan
Director of Graduate School

ETHICS STATEMENT

The thesis entitled “Factors Affecting The Quality of Life of Patients with Diabetes Mellitus: A Descriptive Cross-Sectional Study” was written by myself and in accordance with the scientific and academic rules and ethical conduct. The idea/hypothesis of my thesis solely belongs to my advisor and me. The research pertaining to the thesis was conducted by myself and therefore, all of the used sentences and interpretations within the work belongs to me.

I declare that the aforementioned issues are correct.

Signature

Date :10 /10 / 2022

Student

**Harith AHMED MOHAMMED
MOHAMMED**

PREFACE AND ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to Asst. Prof. Dr. Mùjgan ONARICI and thank her for her kind patience and gratitude and her hard work in guiding me. I benefited from her knowledge and experience while preparing this modest work. I would also like to thank all the professors who expressed their scientific opinions in the questionnaire and research. I also extend my sincere thanks to everyone who helped me, near or far. The same goes to my family for their undying support and confidence in me.

The study entitled “Factors Affecting The Quality of Life of Patients with Diabetes Mellitus: A Descriptive Cross-Sectional Study” was funded by the Harith AHMED MOHAMMED MOHAMMED, to earn M.Sc. in Internal Medicine Nursing

Harith AHMED MOHAMMED

MOHAMMED

Çankırı -2022

LIST OF CONTENTS

ACCEPTANCE AND APPROVAL	i
ETHICS STATEMENT	ii
PREFACE AND ACKNOWLEDGEMENTS	iii
LIST OF CONTENTS	iv
ABBREVIATIONS AND SYMBOLS	vii
LIST OF TABLE	ix
ABSTRACT	x
ÖZET	xii
1. INTRODUCTION	1
1.1. Statement of Problem	5
1.2. Objectives of The Study	6
1.3. Limitations of The Study	6
1.4. Assumptions of The Study	6
2. LITERATURE REVIEW	7
2.1. Definition of Diabetes Mellitus	7
2.2. Epidemiology	7
2.3. Pathophysiology	8
2.4. Types of Diabetes Mellitus	9
2.4.1. The type one	9
2.4.2. The type two	10
2.4.3. Gestational diabetes	10
2.4.4. Other types	11
2.5. Symptoms and Signs of Diabetes Mellitus	11
2.6. Causes and Risk Factors of Diabetes Mellitus	12
2.7. Complications	13
2.7.1. Introduction	13
2.7.2. Diabetic neuropathy	13

2.7.3. Diabetic Foot disease	14
2.7.4. Diabetic Retinopathy.....	14
2.7.5. Cardiovascular diseases	14
2.7.6. Diabetic nephropathy	15
2.8. Diagnoses of Diabetes Mellitus	15
2.9. Assessment of Diabetes Mellitus	17
2.10. Treatment and Management of Diabetes	17
2.11. Insulin.....	19
2.11.1. Short-Acting insulin.....	19
2.11.2. Rapid-Acting insulin	19
2.11.3. Intermediate-Acting insulin	19
2.11.4. Long-Acting insulin	19
2.12. Identification of Diabetes Mellitus.....	20
2.13. Nursing Care in Diabetes Mellitus.....	20
2.14. Factors Affecting Patients' Adherence to Diabetes Mellitus	22
2.14.1. Socio-economic status.....	22
2.14.2. Education level	22
2.14.3. Ethnicity and gender.....	22
2.14.4. Self-efficacy	23
2.15. Quality of Life.....	23
2.15.1. Assessment of the quality of life	24
3. MATERIALS AND METHOD.....	26
3.1. Aim of The Study.....	26
3.2. Design of The Study	26
3.3. Setting of The Study	26
3.4. Sample of The Study.....	26
3.4.1. Inclusion criteria.....	26
3.4.2. Exclusion criteria	26
3.5. Data Collection Tools	27
3.5.1. Part I: Socio-demographic data	27
3.5.2. Part II: Clinical data	27
3.5.3. Part III: Quality of life questionnaire	27
3.6. Data Collection.....	28
3.7. Data Analysis	28

3.8. The Ethical Considerations	29
4. RESULTS	30
5. DISCUSSION	38
6. CONCLUSION AND RECOMMENDATIONS:.....	46
APPENDIX 1: The Questionnaire of The Study (in the language of English and Arabic).....	60
APPENDIX 2: Approval of using the questionnaire (By E-mail).....	74
APPENDIX 3: Search permissions.....	75
APPENDIX 4: Ethical Approval of CAKU	78
CURRICULUM VITAE	79



ABBREVIATIONS AND SYMBOLS

Abbreviation

Words

DM	Diabetes Mellitus
T1DM	Type one diabetes mellitus
T2DM	Type two diabetes mellitus
ADA	American Diabetes Association
ANOVA	One-way analysis of variance
BMI	Body Mass Index
IDF	International Diabetes Federation
HRQoL	Health-related quality of life
QOL	Quality of life
HbA1c	Hemoglobin A1c
WHO	World Health Organization
IADPSG	International Association of Diabetes and Pregnancy Study Groups
MODY	Maturity onset diabetes of the young
HDL	High-density lipoprotein
UK	United Kingdom
ASCVD	Atherosclerotic Cardiovascular Disease
ESRD	End-stage renal disease
DPN	Diabetic peripheral neuropathy
PNS	Peripheral nervous system
GLP-1	Glucagon-like peptide-1
SGLT-2	Sodium-glucose linked transporter 2
GFR	Glomerular filtration rate
CDA	Canadian Diabetes Association
IDDM	Insulin Dependent Diabetes Mellitus
GDM	Gestational Diabetes Mellitus
U.S	United States

DCCT	Diabetes Control and Complications Trial
DKA	Diabetic Ketoacidosis
ACE	Angiotensin-converting enzyme
ARBs	Angiotensin receptor blockers
CVD	Cardiovascular disease
IFG	Impaired fasting glycaemia
NPH	Neutral Protamine Hagedorn
GAD	Glutamic acid decarboxylase
IGT	Impaired Glucose Tolerance
OGTT	Oral Glucose Tolerance Test
NIDDM	Non- Insulin -Dependent Diabetes Mellitus



LIST OF TABLE

	<u>Page</u>
Table 4.1: Statistical distribution of the participants according to their demographic data.....	30
Table 4.2: Statistical distribution of the participants according to their clinical data.....	32
Table 4.3: Statistical distribution of Quality of Life Domains.....	34
Table 4.4: Correlation between Demographic data and Quality of life scores according to demographic categories.....	35
Table 4.5: Correlation between Clinical data and Quality of life scores according to Clinical categories.....	37

FACTORS AFFECTING THE QUALITY OF LIFE OF PATIENTS WITH DIABETES MELLITUS: A DESCRIPTIVE CROSS-SECTIONAL STUDY

ABSTRACT

MOHAMMED, Harith AHMED MOHAMMED. Factors Affecting The Quality of Life of Patients with Diabetes Mellitus: A Descriptive Cross-Sectional Study, (Master of Science), Çankırı., 2022.

Background: Diabetes mellitus is now one of the most difficult public health issues of the 21st century. It is a metabolic disease that causes high levels of glucose (hyperglycemia) in the blood and stems from problems in insulin production, insulin action, or both. Diabetic patients have a lower quality of life in both rural and urban areas. **Objective:** The aim of the study is to assess the factors affecting the quality of life of diabetics **Method:** This is a descriptive cross-sectional study. 200 adults with diabetes, including 110 females and 90 males, were randomly selected from patients receiving treatment in Sharqat General Hospital in Salah al-Din Governorate. The participants answered a three-part questionnaire including demographic characteristics, medical characteristics, and quality of life domains prepared based on the World Health Organization Quality of Life Questionnaire. Five-point scales were used to classify items. Data collection took place between January 1th, 2022 and February 5th, 2022 through the use of an interview. The data was analyzed by applying descriptive statistical analysis that included number, percentage, mean, standard deviation, p-value and anova. **Results:** When it comes to age groups, the participants were mostly from the age group of 57 years and older (40,5%). The results showed that diabetes was more prevalent in females than in males (55%). The sample comprised almost all married patients (97,5%). As for the education level, a great majority of the participants were primary school graduates (43,5%). About 44% of the samples were housewives. The results also showed that monthly income of the participants was barely sufficient, which was

approximately 54% or more than half. In terms of residence place, most of the patients were living in rural areas (61%). The number of family members in the house ranged between 6-10 members (49%). The number of children was mostly 1-2 (46%). The results showed that number of the patients with diabetes of the second type was higher than number of the patients with diabetes of the first type (61%), and the percentage of diabetes diagnosed for a year or more was 90%. While patients who used oral hypoglycemic drugs was 59,5%, those who used insulin was 29,5%. In terms of the presence of chronic diseases, some patients had mostly heart diseases and hypertension, which accounted for 55% of the diseases and more than half of the patients with diabetes had genetic diseases (53%). About 47% of the participants gave the answer "no," that is, there was no genetic disease. When it comes to smoking, the majority of the participants (83,5%) were non-smokers, while 16,5% of them were smokers. All the participants did not consume alcohol (100%). The rate of patients who had a device for measuring blood glucose was 40,5%. The rates of patients who measured their blood glucose daily, weekly, and monthly were 21,5%, 42,5%, and 36%. The results showed that the body mass index of 25-29,9 had the highest percentage (50%). Upon examination, it was determined that the quality of life was at a high level in social relations, ($72,86 \pm 14,08$), while the lowest mean of score was seen in physical domain ($4,95 \pm 12,67$). quality of life had a strong correlation with some socio-demographic characteristics (gender, educational level, occupation, monthly income, residence, number of children, type of medication, and presence of chronic diseases). Middle-aged and elderly people were more likely to be obese, the information obtained about the disease was acceptable, but the safety precautions against the disease were poor. At the level of $P < 0,05$ there was a significant difference between gender, educational level, occupation, monthly income, residence place, and number of children ($P = 0,003, 0,019, 0,009, <0,0001, <0,0001, \text{ and } 0,031$). There were a significant difference between type of drug, do you have chronic diseases, If yes, who with $P = 0,012, 0,025, \text{ and } 0,009$. **Conclusions:** This study supported the effect of diabetes on the quality of life of patients in our country. It was also observed that the information obtained about the disease was acceptable, but the safety precautions against the disease were weak.

Keywords: Diabetes mellitus, Patients, Quality of li

DIABETES MELLİTUSU OLAN HASTALARIN YAŞAM KALİTESİNİ ETKİLEYEN FAKTÖRLER: TANIMLAYICI KESİTSEL BİR ÇALIŞMA

ÖZET

MOHAMMED, Harith AHMED MOHAMMED. Diabetes Mellitusu olan hastaların yaşam kalitesini etkileyen faktörler: Tanımlayıcı kesitsel bir çalışma, (Yüksek Lisans Tezi), Çankırı, 2022.

Giriş: Diyabet 21. yüzyılın en kritik halk sağlığı sorunlarından birisidir. Kanda yüksek glikoz seviyelerine (hiperglisemi) neden olan metabolik bir hastalıktır. Bu hastalık, insülin üretimi, insülin etkisi veya her ikisiyle ilgili sorunlardan kaynaklanabilir. Diyabetli hastalar hem kırsal hem de kentsel alanlarda daha düşük yaşam kalitesine sahiptir. **Amaç:** Çalışma diyabet hastalarının yaşam kalitesini etkileyen faktörleri değerlendirmeyi amaçlamaktadır. **Yöntem:** Çalışmada tanımlayıcı kesitsel bir tasarım kullanılmıştır. Çalışmanın örneklemini Salah al-Din Vilayeti Sharqat Genel Hastanesi hastaları arasından rastgele seçilen 110'u kadın ve 90'ı erkek olmak üzere toplam 200 yetişkin diyabetli birey oluşturmuştur. Katılımcılar üç bölümden oluşan bir anketi yanıtlamışlardır. Bu bölümler, demografik özellikler, tıbbi özellikler ve Dünya Sağlık Örgütü Yaşam Kalitesi Ölçeği'nden faydalanılarak hazırlanan yaşam kalitesi alanlarını içermektedir. Ölçek maddelerini değerlendirmek için beşli Likert tipi ölçek kullanılmıştır. Veriler, 1 Ocak 2022 - 5 Şubat 2022 tarihleri arasında görüşme yoluyla toplanmış ve sayı, yüzde, ortalama, standart sapma, p-değerini ve anovayı içeren tanımlayıcı istatistiksel analiz uygulanarak analiz edilmiştir. **Bulgular:** Yaş gruplarına bakıldığında ise katılımcıların çoğunluğu 57 yaş ve üzeri (40,5%) yaş grubundandır. Sonuçlar, diyabetin kadınlarda erkeklere göre daha yaygın olduğunu gösterdi (55%). Örneklem, evli hastaların neredeyse tamamını (97,5%) oluşturmuştur. Eğitim düzeyine bakıldığında ise katılımcıların büyük çoğunluğu (43,5%) ilkokul

mezunudur. Örneklemelerin yaklaşık 44% ev hanımıdır. Sonuçlar ayrıca, katılımcıların aylık gelirlerinin zar zor yeterli olduğunu, yani yaklaşık 54%. veya yarısından fazla olduğunu gösterdi. İkamet yeri açısından hastaların çoğu kırsalda yaşıyordu (61%). Evdeki aile bireylerinin sayısı 6-10 kişi (49%) arasında değişmektedir. Çocuk sayısı çoğunlukla 1-2 (46%). Sonuçlar, ikinci tip diyabetli hasta sayısının birinci tip diyabetli hasta sayısından (61%) daha fazla olduğunu ve bir yıl ve daha uzun süredir diyabet tanısı konanların yüzdesinin 90% olduğunu gösterdi. Oral hipoglisemik ilaç kullananların oranı 59,5% iken, insülin kullananların oranı 29,5%. Kronik hastalık varlığı açısından bazı hastalarda daha çok kalp hastalıkları ve hipertansiyon olup, bu hastalıkların 55% oluştururken, diyabetli hastaların yarısından fazlasının genetik hastalıkları (53%) vardı. Katılımcıların yaklaşık 47%"hayır" cevabını vermiştir, yani genetik bir hastalık yoktur. Sigara konusunda ise katılımcıların büyük çoğunluğu (83,5%) sigara içmezken, 16,5% sigara içiyordu. Katılımcıların tamamı alkol (100%) kullanmamıştır. Kan şekeri ölçüm cihazı olan hasta oranı 40,5%. Kan şekerini günlük, haftalık ve aylık olarak ölçen hastaların oranları 21,5%, 42,5% ve 36%. Sonuçlar, 25-29,9 arasındaki vücut kitle indeksinin en yüksek yüzdeye (50%) sahip olduğunu gösterdi. Yapılan incelemede yaşam kalitesinin sosyal ilişkilerde yüksek düzeyde ($72,86 \pm 14,08$), en düşük puan ortalamasının ise fiziksel alanda ($4,95 \pm 12,67$) olduğu belirlendi. Yaşam kalitesinin bazı sosyo-demografik özelliklerle (cinsiyet, eğitim düzeyi, meslek, aylık gelir, ikametgah, çocuk sayısı, ilaç türü ve kronik hastalık varlığı) güçlü bir ilişkisi vardı. Orta yaşlı ve yaşlıların obez olma olasılığı daha yüksekti, hastalıkla ilgili elde edilen bilgiler kabul edilebilirdi ancak hastalığa karşı güvenlik önlemleri zayıftı. $P < 0,05$ düzeyinde cinsiyet, eğitim düzeyi, meslek, aylık gelir, ikamet yeri ve çocuk sayısı arasında anlamlı bir fark vardı ($P = 0,003, 0,019, 0,009, <0,0001, <0,0001$ ve $0,031$). İlaç türü, kronik hastalığınız var mı, Evet ise kimin $P = 0,012, 0,025$ ve $0,009$ olduğu arasında anlamlı fark vardı. **Sonuç:** Bu çalışma diyabet hastalığının ülkemizdeki hastaların yaşam kalitesi üzerindeki etkisini desteklemiştir. Ayrıca hastalıkla ilgili elde edilen bilgilerin kabul edilebilir düzeyde olduğu, ancak hastalığa karşı güvenlik önlemlerinin zayıf olduğu tespit edilmiştir.

Anahtar Kelimeler: Diabetes mellitus, Hastalar, Yaşam Kalitesi.

1. INTRODUCTION

Diabetes mellitus (DM) is a public health problem in all parts of the Arabian Gulf, especially in the Republic of Iraq, and a significant rise has been seen in the number of people with diabetes in the past few years. This condition has already affected more than 25% of the adult population - a concerning fact. What's more, that figure is expected to rise even further by 2030). Over the past few years, the number of people with diabetes has increased almost ten times in Iraq. When people suffer from diabetes and cannot manage it well, this can cause many problems in the blood vessels (Robert and Al Dawish, 2020).

Chronic high blood glucose is a symptom of diabetes. According to the International Diabetes Federation. This symptom could develop because the body isn't producing enough insulin, or the body isn't able to use insulin properly. The diagnosis of diabetes was established in people aged between 20 and 79 in 2015. Chronic hyperglycemia and other metabolic problems in diabetics may increase the risk of developing physical and mental health issues in the long run (cardiovascular diseases, blood diseases, neuropathy, diabetic foot, stroke, etc.). Glycemic control and dietary and lifestyle changes that lead to a twofold increase in blood glucose levels have an effect on many social aspects and daily life, as well (Zheng, Ley and Hu, 2018).

Many people with diabetes around the world would be at risk if they do not treat it. Millions or even a billion people may outnumber patients who need preventive interventions for diabetes care, such as how to use medications correctly (Ogurtsova et al., 2017).

Diabetes is a complex disease. The number of diabetic patients is rapidly increasing worldwide (Boada and Martinez-Moreno, 2013). About a third of diabetes deaths are caused by cardiovascular diseases. More than half of diabetics are expected to die from these diseases, and coronary artery disease is the most likely cause. For people with diabetes, foot ulcers and infections are thought to be the main

reasons for people get sick, are hospitalized, or have their feet amputated. Therefore, about 20% of diabetics have to go to hospital (Zhang, 2014).

Socio-economic status may affect how easily people get health care, how well the care is, and how much social support they receive. It can also affect how well they know about diabetes, how well they communicate with healthcare providers, which types of treatments you choose, and how well they follow doctor's advice about medications, exercise and food. Thus, low socio-economic status can be associated with a number of risks (Grintsova, Maier and Mielck, 2014).

Practice nurses play an important role in the early management of type 1 and type 2 diabetes in primary care, where they help patients understand the disease and how to manage it on their own. As a first step, practice nurses conduct assessments, establish goals, and provide patients with self-management information during more in-person consultations. These discussions lead to lifestyle changes, behavioral changes, and risk reductions (Megahed, 2018).

Diabetes-related problems can be solved if they are diagnosed early and treated properly. The main goal of diabetes management is to prevent the occurrence of macro- and micro-vascular complications by keeping blood glucose levels under control (Herath, Weerasinghe, Dias and Weeraratna, 2017). Numerous studies show that people who are well-informed and careful about their diabetes self-care have better and more long-term control of their blood glucose levels (Powers et al., 2015).

In addition to the negative health effects it causes, having type II can make it hard for a person to do the things they want to do and that are important to them. People with diabetes very much struggle in this area. (Marinho et al., 2016).

Moreover, such complications as blindness and neuropathy, can negatively impact one's household tasks, and their abilities to drive and move around their community. Type 2 diabetes can also make it more difficult for a person to do normal things because they're preoccupied with checking their blood glucose levels, taking care of their feet, and managing medication (Estes, 2017).

Type 2 diabetes is a long-term condition. Patients with type 2 diabetes mellitus are responsible for their care. Healthcare institutions and preventative care practices intend people with type 2 diabetes to be able to manage their own health better (American Diabetes Association (ADA), 2018).

Many factors are to blame for the poor quality of life (QoL) diabetics have. They are also more likely to be overweight, older, less active as well as have high blood pressure, heart disease, and high cholesterol (Myers et al., 2013).

Diabetes has become the leading cause of death in both the developed and developing countries. It is one of the most important health, social and economic problems in the today's world and is getting worse (Madmoli et al., 2019). It is important to educate people about diabetes as a leading cause of death worldwide (Godman et al., 2015). As people live longer, it becomes clear that they need more measures of health than just life expectancy and cause of death, especially when it comes to how long they live (Timar et al., 2016).

QoL can be used to summarize an individual's life in every way - hence making it different from other aspects of QoL. As such, physical, emotional, mental, and social performance are also taken into account when talking about health-related quality of life (HRQoL). At a particular time or period of time, it is important to know how a patient's QoL changes (Timar et al., 2016).

Health-related quality of life (HRQL) is a concept or method that refers to measurement of one's health and has become more important for healthy people, such as workers in recent years. There is no single definition of HRQL since it has been used in many different ways. HRQL stands for how health status affects the factors that make people's life better (Silva, Souza, Borges and Fischer, 2010).

It is common for chronic diseases such as diabetes to recur, which can have a significant impact on ability to work and live. It is important to find out evidence indicating that treatment makes people feel better when there is no cure for a long-term disease. Thus, survival is no longer seen as the only goal. Rather, the goal is to enhance, restore or maintain QoL. Persons suffering from long-term illnesses should be cared for to improve their ability to function, reduce their symptoms, control pain, reduce their disability, and live longer through secondary prevention (Porojan, 2016).

The goal of the Diabetes Control Program is to enhance the quality of life for diabetics. Likewise, the main goal of health promotion is to enhance the QoL. To do this, you can use health programs that have a greater impact on morbidity than mortality (Megahed, 2018).

Unlike other long-term illnesses, a person with type 2 DM mostly manages his/her disease. Poor glycemic control caused by insufficient self-administration can

lead one to suffer from complications such as retinopathy, kidney disease, and polyneuropathy and to have an impaired QoL (Hara et al., 2014).

Diabetes care is mostly related to managing this disease. Diabetics should monitor their blood glucose levels, consume proper foods, exercise, and take oral hypoglycemic agents or insulin to keep their disease under control. The main goal of its treatment is to avoid short- and long-term problems while maintaining a good QoL. Quality of life is an important health outcome in its own right and the goal of all health interventions. It is worse for diabetics when compared to people without long-term illnesses. The goal of chronic care is not to get rid of the disease, but rather to improve the patient's functional status, ease their most distressing symptoms, help them live longer through secondary prevention, and improve their QoL (S. Shrivastava, P. Shrivastava and Ramasamy, 2013).

When people are diagnosed with diabetes, they should pay attention to QoL because poor QoL means that they don't care enough about their health, thus resulting in poor blood glucose control, more complications, and worsening of diabetes in the short and long term. It was found that adults with type 2 diabetes who rated their QoL had a lower risk than their counterparts with and without type 1 diabetes (D'Souza, Venkatesaperumal, Ruppert, Karkad and Jacob, 2016).

Quality of life is a major focus of evaluation research, and enhancement of QoL is perhaps the most important goal of all healthcare policies (Altahan and Fadhil, 2016).

"Quality of life" is a term coined by the World Health Organization (WHO) to express how an individual feels about their current situation in life, their place in society, and their own personal values. It helps them achieve their goals and objectives (Cho and Kim, 2021).

Numerous factors affect people's QoL such as their blood glucose levels, glycated hemoglobin, their complications, and their age at diagnosis (Smith et al., 2018).

The level of disease management is not the only thing that can affect QoL. There are also many psychological and social factors that are associated with a long-term management of the disease for a long time. As a result, type 1 DM-associated emotional reactions, such as anger or depression, have been found to have an impact

on QoL, as other factors like self-efficacy and the degree to which you can effectively manage health (Cho and Kim, 2021).

It has also been argued that acceptance of disease influences prognosis of the disease and how well it is managed and treated (Iwanowicz-Palus, Zarajczyk, Pięta and Bień, 2019).

Person's quality of life is influenced by their perceptions of and acceptance of their disease or lifestyle patterns, as well as the degree to which they can exert control over these factors. When a person accepts the difficulties of managing the disease and changes their lifestyles, their QoL gets enhanced (Levy, Burns, Deschênes and Schmitz, 2017).

Because of these complex management strategies, a change in QoL can be expected as a result of how well people manage their health and lives. People with type 1 diabetes need to manage their diet, exercise, relationships with friends and family, and more. Insulin injections aren't the only factor that affects the quality of type 1 diabetes care. Therefore, it is necessary to conduct studies on type 1. While the DM's relationship with QoL and what the person wants must be taken into account as well as other factors. For example, there is no research on the reasons why patients are able to accept their disease. Diabetic patients must adhere to a strict treatment plan, but previous studies have shown that their overall QoL is no worse than that of their healthy peers. In a study on QoL, it was found that a person's ability to cope with the disease was more important than the disease itself. Therefore, it is critical to offer assistance to those affected by the disease to help them cope with it as much as possible. A thorough understanding of Type 1 DM is critical because it can begin at a very young age(Cho and Kim, 2021).

When diabetics make changes, in their lifestyle, this can affect their entire family and their daily emotions and QoL. This includes their food choices, as well as blood glucose measurements for both type 1 and type 2 (Keklik, Bayat and Başdaş, 2020).

1.1. Statement of Problem:

Assessment of Factors Affecting The QoL of Patients with Diabetes Mellitus in Salah Al-Din / Alsharqat / City.

1.2. Objectives of The Study:

The study aims to assess the factors affecting the quality of life of patients with diabetes mellitus.

1.3. Limitations of The Study:

1. The main limitation of the study is that the results of the study cannot be generalized since it had a small sample where the participants were randomly included.
2. The number of the participants was 200. Of all the participants, two were excluded since they did not agree to fill out the form, one of whom for psychological reasons and the other for physical reasons. Any surgery was a factor at that time.
3. Place limits: Al-Sharqat general Hospital, Salah al-Din Governorate, Iraq.

1.4. Assumptions of The Study:

The fundamental assumptions of the models are; our essential hypothetical assumption is that a persistent and active practice of body activities, healthy eat and behavior are definitely It contributes to building a healthy lifestyle, harmful health habits lead to an increase in body mass index (BMI), also as I assumed that participants will understand the questions and be honest in their responses to the interviews, I assumed the interview evidence was reliable and valid, the inclusion criteria in the sample are appropriate, and thus they ensure that all participants have experienced the same phenomenon or similar study.

2. LITERATURE REVIEW

2.1. Definition of Diabetes Mellitus:

Diabetes is a group of metabolic illnesses that induce high blood glucose levels due to insulin synthesis, insulin action, or both. Long-term elevated levels of blood glucose causes many body parts to get damaged such as eyes, kidneys, nerves, and heart and blood vessels. Many of these symptoms are caused by the immune system attacking pancreatic B cells, resulting in insulin deficiency, as well as abnormalities that make it difficult for insulin to fulfill its functions. In some cases, diabetes causes problems with how carbohydrates, fats and proteins are broken down. It can also cause developmental problems and make people more susceptible to certain infections. Uncontrolled diabetes can result in life-threatening short-term complications, including hyperglycemia with ketoacidosis and non-ketogenic hyperosmolar syndrome (ADA, 2014).

2.2. Epidemiology:

In 2014, approximately 422 million adults worldwide had diabetes. In 1980, only 108 million people had diabetes (Roglic, 2016). That is a big and dangerous change, much higher than 30 years ago. It has increased from 4.7% to 8.5% in adults. There has been a significant rise in diabetes in low- and middle-income countries over the past decade, but not to the same extent as in high-income countries. The number of people who died of diabetes in 2012 was 1.5 million. This is about the same number as in 2011. Another 2.2 million people died from elevated level of blood sugar. This made them more susceptible to heart disease and other diseases (Roglic, 2016).

In countries that don't speak Arabic, the prevalence rate of DM is 15.8% in Mexico, 10.0% in Russia, 9.5% in the United States, and 9.0% in China. There were

8.6 % of people in Canada, 8.3 % in India, 7.8 % in Italy, 5.5 % in Germany, 5.5 % in France, and 5.3 % in the UK (Whiting, Guariguata, Weila and Shaw, 2011).

In Arabic-speaking countries, the prevalence of DM is 14.6% in Kuwait, 7.8% in Lebanon, 15.4% in Qatar, 16.8% in Saudi, 15.4% in Bahrain, 18.7% in United Arab Emirates, 11.4% in Egypt, 9% in Libya, 10.10% in Jordan, 13.4% in Oman, 10.9 in Syria, 9.8% in Yemen, 4.2% in Sudan, 8.3% in Morocco, 9.3% in Tunisia, 8.6% in Palestine, 8.5% in Algeria, 5.3% in Mauritania, 3.4% in Somalia and, 10.2% in Iraq (Takian and Kazempour-Ardebili, 2016). The numbers of cases of diabetes receiving treatment in the hospitals and outpatient clinics affiliated with the Directorate of Public Health in the city of Shirqat between 2018 and 2021 were 4773 and 10.692, respectively, yielding 15.465 in total during the past four years (Salah al-Din Health Directorate., 2022).

2.3. Pathophysiology:

Diabetes has a complex etiology and a wide range of symptoms. It often depends on the physical conditions that are existing during assessment or diagnosis time of patients when the person was assessment or diagnosed. There are four main types of diabetes: type 1, type 2, gestational diabetes, and other types. Each of these types has its own set of problems that are associated with other health problems (ADA, 2018a).

Hyperglycemia can make the pancreatic beta cells less effective and make it more difficult for the pancreas to secrete insulin. Hyperglycemia occurs mostly when the blood sugar level is higher than 180 mg/dL. Patients experience osmotic diuresis because their nephrons become full of glucose transporters at elevated levels of blood glucose. Symptoms of frequent urination and polydipsia are likely to occur if blood glucose levels increase by 250 mg/dL. Insulin resistance is caused by an increase in pro-inflammatory fatty acids and cytokines, which makes it difficult for glucose to move through the body and makes fats break down more quickly (Unger and Orci, 2010).

Chronic high blood sugar also results in low blood sugar in proteins and fats that are not caused by enzymes. A glycated hemoglobin test measures amount of HbA1c. If people consume a lot of sugar then this causes damage to small blood vessels in the retina, kidneys, and other parts of the body (Unger and Orci, 2010).

If muscle cells are normal, they may contain as many as 20,000 insulin receptors in each one in order for glucose to reach the cell. An insulin-resistant muscle may have as few as 5,000 insulin receptors, but it still needs insulin. Blood glucose remains high, but muscle glucose remains low due to diabetes (German et al., 2011).

The cells in the body can't use glucose but still need energy. Therefore, they begin to break down protein and fat so they can be used as fuel for the cells. When too much fat is broken down, the resultant acid builds up in the bloodstream and spills into the urine, which is called as ketonuria. Those who do not receive treatment for diabetes suffer from acidity and dehydration because they lose a lot of water and build up ketone bodies in their blood (German et al., 2011).

In muscle tissue, fat, and the liver, insulin does not work properly. There is some evidence that both type 2 and type 1 diabetes are associated with a person's genes (Farmer et al., 2012).

During the first few months of pregnancy, both fasting and postprandial blood glucose levels are typically lower than usual. Gestational diabetes refers to a type of diabetes that starts in the third trimester of pregnancy for women who have high blood glucose levels. GDM is responsible for more than 90% of all occurrences of diabetes and related complications during pregnancy and is more common in some ethnic or racial groups than in others (Yuen and Wong, 2015).

2.4. Types of Diabetes Mellitus:

2.4.1. The type one:

Type 1 diabetes is characterized by destruction of pancreatic beta cells by the immune system, usually resulting in absolute insulin deficiency. It is also called as juvenile and insulin-dependent diabetes that accounts for only 5% to 10% of diabetics. Cell antibodies, insulin antibodies, and autoantibodies are all signs that the immune system destroys beta cells in this type of diabetes. Some people lose beta cells quickly, while others lose them slowly (mostly adults). For children and teens, the first sign of ketoacidosis occurs when they are sick and urinate a lot. Other autoimmune diseases such as thyroiditis and Addison's disease may develop in people suffering from this condition as well as vitiligo, autoimmune liver disease, myasthenia gravis, and pernicious anemia (ADA, 2013).

People with this type of diabetes may become infected more often, and lose their eyesight due to dehydration. When children get sick, they develop more severe symptoms than adults (Aguiree et al., 2013).

2.4.2. The type two:

Type 2 diabetes, also called as adult-onset diabetes, mostly ranges from insulin resistance with relative insulin deficiency to insulin secretory defect. This type of diabetes affects 90% to 95% of people with diabetes. If people do not have insulin resistance, then they suffer from non-insulin dependent diabetes. If they have first-degree relatives with diabetes, they possibly suffer from this disease, as well. In the early stage, they are not completely insulin deficient (ADA, 2013).

People who are not obese may have more belly fat than they should. Rarely, type 2 diabetes can cause ketoacidosis on its own. High blood sugar takes a long time to build up, therefore, this type often progresses unnoticed in the early stages (ADA, 2013).

Women are more likely to be diagnosed with type 2 diabetes than males. Obesity plays a greater role in the incidence in females than males and more than 19% of the population is obese (Schrieke et al., 2018).

2.4.3. Gestational diabetes:

It is one of the least common types of diabetes, and appears during pregnancy only in women who do not have the history of diabetes. Its prevalence is also higher in women who are overweight, have a family history of diabetes, are older mothers, or have been exposed to toxic chemicals. It is required to treat gestational diabetes to lower the mother's blood glucose levels and reduce the risks or problems for the fetus (Kharroubi and Darwish, 2015).

Women with children may suffer from type 2 diabetes at a higher rate (ADA, 2013).

The International Association of Diabetes and Pregnancy Study Groups (IADPSG) is an international group that studies diabetes and pregnancy together. It consists of representatives from a number of obstetric and diabetes groups and encourages women at risk of developing diabetes to get screened before becoming pregnant. This is because GDM, which affects between 1 and 14% of all

pregnancies, depending on who is studied and the tests they applied to them. Every year, more than 200.000 people in the U.S. are diagnosed with GDM (ADA, 2014).

2.4.4. Other types:

Secondary diabetes may be caused by another long-term condition that affects the insulin-producing cells in the pancreas, such as chronic pancreatitis or adenomas. In the event of an infection, surgeons may have to remove the patients' pancreas from their body.. Cancerous tumors and some endocrine diseases are associated with high production of growth hormone and hyperthyroidism, which can occur when a person is poisoned or takes certain medications, such as thyroid hormone and cortisone (Abd-Rabbo, 2017).

Most people have one or two genes that don't function properly in pancreatic cells. If monogenic diabetes begins before the age of six months, it is called as neonatal diabetes. If it starts before the age of 25 years, it is called as maturity-onset diabetes of the young (MODY) (Schwitzgebel, 2014).

2.5. Symptoms and Signs of Diabetes Mellitus:

Some of the most common signs and symptoms of diabetes are

1. Unexplained weight loss
2. Extreme fatigue
3. Irritability
4. A lot of infections, especially in
 - a. one part of the genital tract
 - b. Skin
 - c. The space inside the mouth
 - d. Poor healing of a wound
 - e. Urinal
5. Dry mouth
6. Touching toes hurts and burns
7. Itching
8. Hypoglycemia in case of a stimulus.
9. Less vision
10. impotence or erectile dysfunction

11. Polyphagia (excessive hunger)
12. Polyuria (excessive urination)
13. Polydipsia (excessive thirst) (Ramachandran, 2014).

2.6. Causes and Risk Factors of Diabetes Mellitus:

Most people, especially in rural areas, do not know much about diabetes which has detrimental effects on their health. As the evidence shows, simple risk and cause scores can be used to identify many causes and risks of the disease (ADA, 2014).

Some researchers have stated that genetics and other factors that make the pancreas less healthy play a role in more than 90% of diabetes cases. This is type 1 diabetes because beta cells die from an attack by the immune system. People suffering from this type of diabetes need to use insulin to survive and avoid ketoacidosis, which can be fatal for them (German, Masharani, Gardner and Shoback, 2011).

When it comes to type 2 diabetes, the immune system doesn't destroy beta cells, which convert glucose into sugar (ADA, 2010).

The common causes and risk factors of diabetes include:

- 1. Weight:** People who are overweight or obese, or whose waist size is more than 90 cm for men and more than 80 cm for women, are more likely to develop diabetes than people with a healthy waist size.
- 2. Physical inactivity:** the less active a person is, the higher the likelihood of developing diabetes.
- 3. Family history:** If a family member has diabetes, the chances of developing diabetes go up.
- 4. Race:** African Americans, Asians, Hispanics, Americans, Native Americans, and Pacific Islanders are more likely to get diabetes. Diabetes is also more common among these groups.
- 5. Age:** The risk of developing diabetes increases with age. As people get older, they tend to work out less and lose their muscle mass.
- 6. Gestational diabetes:** If a woman gets diabetes during her pregnancy, the chances of developing diabetes for the rest of her life increase. Additionally, having a baby makes women more likely to get type 2 diabetes.

- 7. Polycystic ovary syndrome:** It is a condition in which the ovaries don't function well. People who have irregular menstrual cycles and are overweight are more likely to get type 2 diabetes.
- 8. Hypertension:** Hypertensive patients who have a blood pressure of 140/90 mmHg and higher are more likely to get diabetes.
- 9. Abnormal levels of cholesterol and triglycerides:** Diabetes is more likely in people with low levels of high-density lipoprotein (HDL), or good cholesterol.
- 10. Environmental factors:** These factors psychologically and socially affect diabetes, regardless of how old they are (Matheka, 2017).

2.7. Complications:

2.7.1. Introduction:

Diabetics who are not well managed can have complications in two main categories: microvascular diseases, including neuropathy, retinopathy, nephropathy (renal damage) and macrovascular diseases, including coronary artery disease, peripheral vascular disease, hypertension, and stroke (Pisimisis, 2014).

2.7.2. Diabetic neuropathy:

Diabetes can cause a lot of damage to the nervous system. Sufferers often experience diabetic neuropathy as a side effect. In fact, the World Health Organization reports that up to 50% of people with diabetes are affected by the disease in some ways. Neuropathy can cause loss of sensation and limb damage and may lead men to be unable to have sex (Pisimisis, 2014).

Peripheral nervous system (PNS) can have different clinical types, pathophysiological pathways, onset, and progression (Oyenihi, Ayeleso, Mukwevho and Masola, 2015).

It is not known how glycaemia and diabetic peripheral neuropathy (DPN) are associated with one another (Shillo et al., 2019).

Recent studies have showed that reactive oxygen species and mitochondrial dysfunction may cause neuronal death. Mechanistic and pathological findings do not discriminate painless DPN (Lee et al., 2019).

2.7.3. Diabetic Foot disease:

Diabetic foot ulcers usually occur on the soles of the feet of diabetics because they have peripheral neuropathy, peripheral arterial disease, necrosis, or inflammation in all layers of the skin (Delgado, 2018).

Endothelial cell inflammation and smooth cell defects are caused by elevated levels of blood glucose in peripheral arteries. Endothelial dysfunction is the most serious condition causing microcirculation due to changes in endothelial cell differentiation, basement membrane thickening, decreased production of nitric oxide, increased blood viscosity, microvascular strength, and decreased blood volume (Atlas, 2015).

Diabetes can cause ulcers and infections resulting in lower limb amputations that are not caused by an accident. Diabetes makes diabetics eight times more likely to lose a limb than non-diabetics (Pisimisis, 2014).

2.7.4. Diabetic Retinopathy:

Diabetic retinopathy is a major cause of blindness and visual impairment. In the UK, many people have gone blind. A study reveals that retinopathy develops in nearly all the patients with type 1 and 77% of those with type 2 diabetes 20 years after the onset. Retinopathy affects 12% of people with type 1 diabetes who are over 30 years old (Pisimisis, 2014).

This disease pushes into a "proliferative" phase, macular edema is activated, and fluid builds up in the retina through angiogenesis. Death occurs in more serious situations, considering the deterioration of the fibrovascular membrane that may lead to retinal detachment after a short time (Liu, Li, Ma, and Tong, 2020).

2.7.5. Cardiovascular diseases:

Cardiovascular diseases are so prevalent, thus resulting in the leading cause of mortality and disability. Heart disease is more common among those with type 2 diabetes than healthy ones. Diabetics die from heart disease at a rate of 50 to 80% worldwide, according to a study by the International Diabetes Federation (IDF). There are many deaths among diabetics. Up to five times more diabetics between the ages of 30 and 59 from die heart disease than people without diabetes. In the United States, women with diabetes constitute 75% to 80% of all deaths. Excessive blood

pressure, high cholesterol, and being overweight are all causes of heart disease. Here, smoking isn't the only vice. People with diabetes have a four-to-five-fold increased risk of cardiovascular diseases compared to the general population (Pisimisis, 2014).

2.7.6. Diabetic nephropathy:

Renal arteries can be damaged by elevated level of blood glucose and high blood pressure in people with diabetes. The American Diabetes Association states that 20-40% of diabetics will develop nephropathy at some point (Pisimisis, 2014).

Nephropathy is a long-term side effect of both types of diabetes, T1DM and T2DM that is caused by increased albuminuria (proteinuria) or decreased renal glomerular filtration rate (GFR) (Alicic, Rooney and Tuttle, 2017).

Type 1 diabetes (T1D): 30% and 40% of people with type 2 diabetes have proteinuria, which means excessive urine (T2D). Another important cause, end-stage kidney disease (ESKD) accounts for about 40% of all new kidney replacement therapies in the world (Ritz, Zeng and Rychlík, 2011).

2.8. Diagnoses of Diabetes Mellitus:

Only standardized, quality-assured laboratory methods can be used to measure venous plasma glucose levels and HbA1c during diagnosis of diabetes. In order to achieve this, two following methods are employed: Either a tube of blood is frozen and thrown away, or accurate additives are used to prevent the fats from breaking down within 30 minutes of blood collection (citrate plus fluoride; fluoride by itself is not enough) (Kerner and Brückel, 2014).

The WHO has published current diabetes diagnostic criteria. These standards are consistent with the consensus statement of the American Diabetes Association (ADA) and Canadian Diabetes Association (CDA) (Alam, Asghar, Azmi, and Malik, 2014).

1. A fasting plasma glucose of 126 mg/dL (7.0 mmol/L) in 2 or more tests
2. The plasma glucose level in subjects with a 2-hour glucose load (75 grams) is 200 mg/dL (11.1 mg/L) (oral glucose tolerance test, OGTT)
3. Blood glucose level is 200 mg/dL (11.1 mmol/L) at random (ADA, 2010a).

A1c (HbA1c) has recently been used by the ADA as a diagnostic test for diabetes mellitus and a marker for control of hyperglycemia (ADA, 2010a).

48 mmol/ml (6.5%) has been approved and standardized for the diabetes control and complications trial (DCCT) and is believed to be a good marker for diabetes if the blood glucose level is 48 mmol/ml. A study reported that When the HbA1c level is high, microvascular problems, such as retinopathy, rise rapidly in the range of 49-53 mmol/ml (6.6-7.0 percent) (Mannarino, Tonelli and Allan, 2013).

Prediabetes is defined by the ADA in the following manner:

A. Impaired fasting glycaemia (IFG) is defined as a plasma glucose level between 100 and 125 mg/dL (5.6-6.9 mmol/L) after an overnight fast (American Diabetes Mellitus). These values are different from the WHO's standards ($110 < 126$ mg/dL ($6.1 < 7.0$ mmol/L)).

B. When one takes 75 grams of oral glucose after an overnight fast, their blood glucose levels should be between 140 and 199 mg/dL within two hours. This means that they are at high risk of developing diabetes or prediabetes (ADA, 2010a).

People with impaired fasting glycaemia (IFG) and impaired glucose tolerance (IGT) may be more likely to develop heart disease, but this is not a certain result. The plasma glucose concentration at 1 hour during the OGTT is a powerful predictor of future risk for type 2 diabetes at 155 mg/dL (9.2 mmol/L). Obesity depends on waist circumference and is specific to a person's ethnicity.

1. High triglyceride levels: 150 mg/dL (1.7 mmol/L) or hyperlipidemia treatment
2. It is also essential to maintain a healthy level of HDL cholesterol. While males should have less than 40 mg/dL (1.03 mmol/L), females should have less than 50 mg/dL (1.29).
3. Systolic blood pressure and diastolic blood pressure: 130 mm Hg and 85 mm Hg, respectively or treatments should be discovered for high blood pressure.
4. IFG or type 2 DM already diagnosed (Alam et al., 2014).

People who have IGT show signs of retinopathy, microalbuminuria, and especially neuropathy, which should change our risk stratification and treatment method for people with IGT (Alam et al., 2014).

2.9. Assessment of Diabetes Mellitus:

The physicians look at the patients' family history of diabetes, ethnicity, and age to identify any risk factor. Autoimmune status and insulin resistance are two important factors in the patients' medical history while determining the possibility of getting diabetes. To do so, patients are examined and their assessment results are assessed. It was often not a problem at first. When a person has hyperglycemia, they may have a weak skin swelling because they cannot get enough water and their breath may smell fruity due to ketoacidosis. All these considerations can be found out through an evaluation and a physical examination (Choi and Chung, 2016).

Fatigue, wheezing nausea, and vomiting are all signs of diabetic ketoacidosis (DKA), and clinicians and nurses should be aware of them, too. Bleeding or secretions may show up on the macula after examination of the fundus of the eye in a diabetic person (Carrillo-Larco, Barengo, Ibitres-Flores and Bernabe-Ortiz., 2019).

T1DM and T2DM may look the same, but can be distinguished clinically and physically. This is called as acanthosis nigricans. The dark blotches on the neck, armpits, or inguinal creases of the skin are to blame for it. Patients with high blood glucose are prone to suffer symptoms such as hazy vision, recurrent yeast infections, and tingling or pain in the hands or feet. During each visit, the nurses should ask if there are any changes in the skin of the patient's foot (Hussain and Chaudhry, 2019)

2.10. Treatment and Management of Diabetes:

Despite the fact that there is currently no remedy for diabetes, there are many effective good ways to manage it. Before any treatment begins, a comprehensive examination should be done to find out what type of diabetes the person has, look for any complications, and look at any treatments the person has already undergone. Diabetes control can be achieved through a controlled diet, exercise, diabetes education or medication. There are two main types of medication: oral hypoglycemic drugs and insulin. People with type 1 diabetes, which often results from lack of insulin, require daily insulin injection for treatment. While diet and exercise may be sufficient for some of people with type 2 diabetes, some may need oral medications or insulin, especially during onset of the disease (Pisimisis, 2014).

The pancreas may become more sensitive to or produce insulin. Other treatments may carry out this as well. Medications such as metformin, sulfonylureas,

meglitinides, alpha-glucosidase inhibitors, and thiazolidinediones are some of the specific drug groups. They function by blocking the enzymes that break down sugar. Metformin is the first drug doctors prescribe for people with diabetes. This drug works well before and after eating because it lowers blood glucose levels in both directions (Wing et al., 2011).

Liraglutide and semaglutide, both Glucagon-like peptide-1 (GLP-1) agonists, are associated with improved cardiovascular outcomes. Empagliflozin and canagliflozin, both sodium-glucose linked transporter 2 (SGLT-2) inhibitors, have been shown to improve cardiovascular outcomes, as well as renal protection and prevention of heart failure. Since diabetes can lead to problems with small blood vessels. Regular diabetic retinal exams should be performed by qualified medical professionals to detect signs of diabetic retinopathy. Neurological examinations can help identify patients with neuropathy who are at risk of amputation. It may be necessary to administer low doses of tricyclic antidepressants, duloxetine, anticonvulsants, and topical capsaicin and pain medications may be necessary. In individuals with diabetes who have elevated levels of microalbumin in their urine the efficiency of the kidneys can be determined based on their estimated glomerular filtration rate and the amount of urine they produce. Angiotensin converting enzyme (ACE) inhibitors and angiotensin receptor blockers (ARBs) are the most effective drugs for reversing the progression of microalbuminuria to macroalbuminuria in people with type 1 and type 2 diabetes, respectively. The US Food and Drug Administration has approved pregabalin and duloxetine for diabetic patients with peripheral neuropathy. Tricyclic antidepressants and anticonvulsant drugs are also used to treat diabetic neuropathic pain but they have not always been effective (De Boer et al., 2017).

As part of the drug treatment of hypertension and diabetes, ACE inhibitors, angiotensin receptor blockers, diuretics, beta-blockers, and calcium channel blockers are prescribed. The American Diabetes Association advises diabetics to monitor their cholesterol levels. In the absence of evidence of cardiovascular disease (CVD), a LDL-C level of less than 100 mg/dL is preferred, while a LDL-C level of less than 70 mg/dL is preferred in patients with AMD (ASCVD). If you have diabetes and high cholesterol, statins should be the first line of defense for the patients in low-dose aspirin, according to the American Diabetes Association (Saito et al., 2011).

2.11. Insulin:

Insulin is the hormone secreted by the pancreas to regulate the level of sugar in the blood at a safe level. It must be broken down in the stomach and intestines before it is absorbed, therefore, it cannot be given orally but only by subcutaneous injection. Insulin is used to treat people with type 1 diabetes who do not have enough to meet their needs (Abd-Rabbo, 2017).

Insulin contains 51 amino acids and is required to keep blood glucose at a constant level, grow cells, and use the energy they get (Lewis and Brubaker, 2021).

There are many types of insulin, but the most important ones are:

2.11.1. Short-Acting insulin: Patients need to take regular insulin before they eat to prevent their blood glucose from spiking after their meal. Hexagons form when injected into the SQ space, slowing down their absorption. Ordinary insulin takes 30 to 60 minutes to begin acting; therefore, it should be administered 30 minutes before starting to eat a meal to help decrease the rise in blood glucose after a meal (Silver et al., 2018).

2.11.2. Rapid-Acting insulin: After insulin is injected into the SQ space, fewer hexagons form due to changes in the amino acid structure. More insulin breaks down into the monomers, more insulin enters in the bloodstream, and insulin acts in a shorter period of time. Rapid-acting insulin analogues are just as potent in the body as regular human insulin. It is better to administer patients a rapid-acting insulin about 15 to 20 minutes before they eat than regular insulin 30 minutes beforehand (Silver et al., 2018).

2.11.3. Intermediate-Acting insulin: Insulin injected subcutaneously can continue to work longer if the protamine protein is added, resulting in the development of NPH (Neutral Protamine Hagedorn) insulin. When it comes to intermediate-acting insulin, its onset action is about two hours, the peak effect of NPH is six to 14 hours, and its action duration is 10 to 16 hours. NPH can only be used as a basal insulin at night. Since it is taken first thing in the morning, you can use it as a source of insulin throughout the night and after eating (Silver et al., 2018).

2.11.4. Long-Acting insulin: Long-acting insulin takes care of the need for basal insulin to keep blood sugar levels from rising when patients are not eating. Basal insulin stops gluconeogenesis in the liver which is also used by people with type 1 diabetic ketogenesis, which occurs when the body makes fat (Silver et al., 2018).

2.12. Identification of Diabetes Mellitus:

T1DM is usually diagnosed by reviewing the patient's medical history and blood glucose levels (fasting glucose of > 126 mg/dL, random glucose of > 200 mg/dL, or hemoglobin A1c of > 6.5 percent). T1DM can develop in those who have antibodies to insulin or the enzyme glutamic acid decarboxylase (GAD). For early diagnosis of type 2 diabetes, fasting glucose and HbA1c tests are necessary by monitoring blood glucose levels through OGTT. Type 2 diabetes can develop if fasting blood glucose levels are between 100 and 125 mg/dL or post-OGTT glucose levels are between 140 and 200 mg/dL, indicating pre-diabetes (ADA, 2013a).

Every pregnant woman is screened with a one-hour fasting glucose test between the 24th and 28th gestational weeks to see if she has diabetes (Karagiannis, Bekiari, Manolopoulos, Paletas, and Tsapas, 2011).

Blood lipids of diabetics should be checked. Also some people should have their level of thyroid hormone checked each year since they are more likely to develop hypothyroidism (ADA, 2013a).

2.13. Nursing Care in Diabetes Mellitus:

Diabetes is a complex and multisystem disease that must be managed through a variety of approaches based on specific clinical guidelines. The advices of the World Health Organization, the International Diabetes Federation, and the American Diabetes Association regarding diabetes should be followed (ADA, 2015).

The related guidelines state that diabetes management should lower blood glucose levels, make lifestyle changes, and reduce the risk of diabetes complications (Dunning and Sinclair, 2014).

A good team should include at least a doctor, a teacher, a nutritionist and a nurse. Special units should be established for people at risk of complications from diabetes. Also, the outpatient clinic should have sufficient space and time for patients, a way to track diabetes consultations, and channels for patients to contact specialists (Elhendi, 2015).

The common nursing care and guidelines of diabetes include:

- 1. Medical history:** how the patients are, what they eat, how well they sleep, what medications they've taken, and how well they know how to manage their diabetes.

- 2. Physical examination:** BMI, blood pressure, a full foot examination, a fundoscopy, and neurological examinations.
- 3. Laboratory:** A microalbumin urine test as well as fasting lipid profiles and blood glucose (FBG, RBG, HbA1c)
- 4. Medication plans:** It includes control and treatment of blood glucose and other risk factors, like hypertension and obesity.
- 5. Education:** Teaching patients about what could happen if they don't follow this plan
- 6. Healing wounds:** if diabetics get hurt, their injury don't get heal quickly (Elhendi, 2015).

Fasting and postprandial glucose are among the methods to monitor glycemic management as well as HbA1c (every 3 months). According to WHO guidelines, HbA1c is the only test for this monitoring. This option is a possible alternative because HbA1c is expensive (Elhendi, 2015).

Diabetes is a long-term condition that requires medical and nursing care as well as lifestyle changes. It is crucial for the doctors to examine patients on a regular basis in order to avoid any long-term problems. With the alarming rise in diabetes statistics, nurses are becoming more and more important in helping patients control their illnesses. Frontline nurses can screen diabetic patients early, identify them and correct futile treatment regimens, and assist patients attending family medicine outpatient clinics on setting, reaching therapeutic goals, and looking for complications associated with diabetes (Davies and Buxton, 2015).

WHO states that an effective patient care and education keep diabetics healthy and enhance their quality of life and also diabetes should be treated and its complications should be prevented to reduce morbidity and mortality as well as treatment costs (Megahed, 2018).

Health education and public awareness are important. Healthcare professionals, especially nurses are crucial for the success of diabetes care and diabetes awareness (Unadike, 2010).

2.14. Factors Affecting Patients' Adherence to Diabetes Mellitus:

There are various factors that influence the compliance of diabetic patients with the recommendations of their doctors and health advisers. These factors include the patient's socio-economic status, education level, self-efficacy, gender and ethnicity (Asche, LaFleur and Conner, 2011).

1.14.1. Socio-economic status: Socio-economic status has a negative association with the prevalence of diabetes. For example, low-income families typically do not have many healthy food options, exercise opportunities, and treatment plans (Nur, 2015).

These people cannot join exercise classes or buy diabetes medicines on a regular basis because their families do not have a high level of income and are not educated well due to their socio-economic status (Borgsteede et al., 2011).

Many low-income diabetics mostly among African Americans have negative opinions about their treatment. Trusting the relationship with the primary care provider may help relieve these patients' fears (Nur, 2015).

2.14.2. Education level: Many diabetics may not follow the advice of their doctors and health advisers on how to maintain their blood glucose levels. Patients' education level and medication compliance are the main factors that affect blood glucose levels. The researchers stated that increasing knowledge in people with diabetes can help them better manage their health and be more aware of how to keep their condition under control. Some diabetics may find it difficult to understand the course of the disease in the future. When people have been diagnosed with diabetes for a long term, they have more knowledge about the disease compared to people who have been recently diagnosed (Nur, 2015).

2.14.3. Ethnicity and gender: People with diabetes may not follow the advice of their doctors or health adviser if they happen to be of the opposite gender. According to one study, Caucasian American diabetics have higher rates of adherence than African American diabetics (Osborne and Brown, 2011).

It has been determined that patients' views and attitudes, as well as other factors such as socio-economic position, type of insurance, and accessibility, can provide some explanation for discrepancies between genders. Men and women have different ideas about how willing they are to take steps to promote their health.

However, researchers have found that diabetics who are female and in 30s and 40s are more likely to disobey their doctors (Nur, 2015).

2.14.4. Self-efficacy: A higher sense of self-efficacy may also be associated with blood glucose control, diabetes medicine, and exercise. Self-efficacy is crucial for diabetics when they take charge of their own care (Gao et al., 2013).

People can do things on their own with better blood sugar control. When some diabetics think that blood sugar control will help them stay healthy and reduce health risks, they are able to identify health problems associated with elevated level of blood glucose. Thus, they follow the advice of their doctors and health advisers better by taking diabetes medications, eating healthy food and exercising as prescribed (Nur, 2015).

2.15. Quality of Life:

Quality of life (QoL) is critical for diabetics and their healthcare providers. Many people with diabetes have a poor QoL, which can make them less interested in taking care of themselves or managing their diabetes. When diabetes self-care is discontinued, it leads to poor blood sugar control and an increased risk of other health problems. QoL-related issues are very important because they can have a significant impact on a person's ability to manage their illness and maintain their health and well-being for a long time (Mathew et al., 2014)

There is no consistent definition of QoL. Nevertheless it refers to a field of study rather than a single variable and is commonly used in medicine to describe patients' (Megahed, 2018).

Quality of life was first reported in the field of nephrology in the late 1960s. The standard method for assessing QoL has been in use since 1890 (Salvador-Carulla, Lucas, Ayuso-Mateos and Miret, 2014).

QoL is a term that came into use in the early 20th century as a political term. The World Health Organization decided to prepare WHOQOL-100, an international QoL scale. It was later renamed as WHOQOL-BREF. Individuals view their feelings about life in relation to their culture and value systems, as well as their goals, expectations, standards, and interests. The World Health Organization defines QoL as one's physical and mental health, as well as social relationships and beliefs about

what is important in their circle (Spasić, Veličković-Radovanović, Catić-Đorđević, Stefanović and Cvetković, 2014).

Quality of life is the way people or groups feel that their needs are being met and there are no barriers to happiness and satisfaction. Happiness is a cognitive and emotional state for them (Riaz, Rehman, Hakeem and Shaheen, 2013).

It is a state of well-being including two parts: the ability to perform daily tasks that demonstrate physical, psychological, and social well-being as well as patient satisfaction with levels of performance and disease control (Lavdaniti and Tsitsis, 2015).

HRQoL also measures how people feel about their lives by assessing physical and emotional well-being, independence, social relationships, and important matters in their environment. When people think about how their physical symptoms, health beliefs, and ability to do things every day, this affects their lives as a whole. Physical symptoms include symptoms associated with the disease, as well as how those symptoms affect a person's ability to function and their perceptions of their health. People's perceptions of health have a significant impact on how long they live and how happy they are with their lives. Being a part of HRQoL, functional ability includes activities such as self-care, interpersonal relationships, social support, sleep, cognitive functioning, coping, and emotions (Megahed, 2018).

Physical performance is another part of health-related QoL that indicates how well people are able to do basic things like getting dressed and going to the bathroom. Many people think of social functioning as how well people interact with their family and friends and how well they can do social things. Emotional functioning is often viewed as the negative effects of illnesses such as depression or anxiety (Megahed, 2018).

2.15.1. Assessment of the quality of life:

An assessment on an individual's QoL is an important source of medical information in addition to laboratory or diagnostic testing and is becoming more important in controlled clinical trials. QoL measures are becoming more and more important when it comes to assessing chronic diseases and evaluating medical outcomes. These assessments can be used as a baseline and outcome measure, and

also to see how a change in patients' QoL will affect them (Ahmadi, Shahidi, Nejati, Karami and Masoomi, 2013).

It is required to find out what people think about their health for figuring out how well they are doing and to consider how well patients are able to perform their daily tasks (physical, mental, and social) for that disease or its treatment plan. Diabetics tend to think about their physical and mental state alongside how well their treatment is going (if at all) when asked about their QoL (Megahed, 2018).



3. MATERIALS AND METHOD:

3.1. Aim of The Study: The study aims to assess the factors affecting the quality of life for patients with diabetes mellitus.

3.2. Design of The Study:

The study was conducted based on quantitative descriptive cross sectional design between the first week of January 1th, 2022 to February 5th, 2022, to assess the quality of life of diabetic patients in the Sharqat City, Iraq.

3.3. Setting of The Study:

The study was conducted in a hospital affiliated with Salah Al-Din Health Directorate and located in the northern part of the Al-Sharqat city. The hospital was established in 1971 and offers healthcare to all patients in the governorate.

3.4. Sample of The Study:

The sample of this study consisted of 200 people with diabetes who fulfilled the inclusion criteria, aged 18 years and over, and had no mental retardation, and were diagnosed with diabetes in accordance with purposive sampling.

3.4.1. Inclusion criteria:

1. Being diagnosed with diabetes mellitus
2. Being 18 years old or over.
3. Receiving the treatment for 6 months or more.
4. Being able to verbally communicate

3.4.2. Exclusion criteria:

1. Suffering from mental disorders or having no speech or hearing ability
2. Having serious circumstances that prevent cooperation
3. Knowing no Arabic

3.5. Data Collection Tools:

An assessment tool was adopted and developed by the researcher to measure the impact of quality of life on diabetic patients. It consists of three parts (Appendix-1) (Al-Tukmagi, and Moussa, 2014; Hussain and Chowdhury, 2019; Hussein, Khther and Al-Hadithi, 2011; Khayyat et al.,2019; Kumait, 2014; Mohammed-Ali, & Hamza, 2016; Ohaeri & Awadalla 2009; Kumait, 2014; Thunander et al., 2014; Yousif Almkhtar, Abdul Aziz Mostafa, 2012).

3.5.1. Part I: Socio-demographic data:

This part consists of 9 items, which include age, gender, marital status, education level, occupation, financial status, residence place, number of family members in the house, and number of children (Thunander et al., 2012; Kumait, 2014; Mohammed-Ali, & Hamza, 2016; Hussain and Chowdhury, 2019; Hussein, Khther and Al-Hadithi, 2011; Khayyat et al.,2019; Ohaeri & Awadalla 2009)

3.5.2. Part II: Clinical data:

The second part of the form consists of 10 items, which include Type of diabetes, duration of the diabetes diagnosis, type of drug, presence of chronic diseases, family history of diabetes, smoking, alcohol consumption, presence of a device for measuring blood glucose, frequency of measuring blood sugar, and body mass index ((Thunander et al., 2012; Kumait, 2014; Mohammed-Ali, & Hamza, 2016; Hussain and Chowdhury, 2019; Hussein, Khther and Al-Hadithi, 2011; Khayyat et al.,2019; Ohaeri & Awadalla 2009)

3.5.3. Part III: Quality of life questionnaire:

The scale developed by WHO and whose Arabic validity and reliability study was conducted by Ohaeri and Awadalla (2009) was used. The WHOQOL-BREF is a 26-item questionnaire with four domains: physical health (seven items), psychological health (six items), social health (three items) and environmental health (eight items), as well as QoL and general health questions. Each item on the WHOQOL-BREF is rated from one to five on a response scale that is specified as a five-point ordinal scale. The scores are then linearly translated to a 0-100 scale (Skevington and Tucker, 1999). This scale is developed by WHO, it should certainly be known that the Arabic validity and reliability carried out by Ohaeri and Awadalla in 2009. The internal consistency

values for the full questionnaire and the domains had $\alpha \geq 0.7$ from Cronbach. The reliability coefficient (internal consistency) of the QOL scale and its domains in this study. It confirms that the distribution was as follows: the physical domain (0.73), the psychological domain (0.75), the social domain (0.76), and the environmental domain (0.77), while the overall Cronbach score in this study is 0.82. The Quality of life questionnaire is assessed from the 4 sub-dimensions that were written above in 5 different categories that have been written below; the first category, the assessment of patients' feelings about the disease, has 5 items (Very poor, Poor, Neither poor nor good, Good, Very Good). The second category, the "how exposed are diabetic patients to certain things", has 5 items (Not at all, slightly, moderately, good, extremely). The third category, how well patients can complete specific tasks, includes 5 items (Not at all, slightly, moderately, good, extremely). The fourth category, how satisfied diabetic patients are with various aspects of their lives, has 5 items (Very dissatisfied, Fairly dissatisfied, Neither satisfied nor dissatisfied, Satisfied, Very satisfied). The fifth category, "how many times have you felt or been exposed to certain things", includes 5 items (Never, Infrequently, Sometimes, Frequently, Always) (Ohaeri & Awadalla 2009).

3.6. Data Collection:

The researcher collected data by conducting individually interviews with diabetic patients based on the structured interview method at Al Sharqat General Hospital using the Arabic version of the questionnaire. Data collection took place from January 1th, 2022 to February 5th, 2022. It took approximately 15-20 minutes for each participant to complete the interview.

3.7. Data Analysis:

The data was analyzed in SPSS version 20. The number, percentage, arithmetic, mean and standard deviation as well as one-way anova and t test were used to assess the data. The level of significance was set as $P \leq 0.05$.

3.8. The Ethical Considerations:

Permission was obtained from the authors of the questionnaire Ohaeri and Awadalla (2009) (Appendix-2) to use it in the study. Ethical approval was obtained from the Research Ethics Committee of the Scientific Research Committee in the Salah al-Din Health Department on 1/11/2021. For ethical and moral reasons, and for the purpose of facilitating the research and data collection process, an official administrative arrangement was obtained from the Salah al-Din General Directorate of Health (Appendix-3). Entering the hospital was quick and effortless. It also made the encounter with the patient easier and helped convince them to take part in the interview. All the participants were verbally informed of the study's objectives and given the consent to participate voluntarily in the study. Additionally, each individual was informed that their information would be kept confidential. Their names were not written or recorded to assure their confidentiality. They had the right to refuse to answer a question or withdraw from the study at any moment with no penalties. The interview was conducted in a more relaxed atmosphere due to well-developed communication skills used with the participants. Also ethical approval was obtained from the ethics committee of Cankırı Karatekin University for the title of the thesis on December 28th, 2021 (Appendix-4).

4. RESULTS

The study aims to assess the factors affecting the quality of life for patients with diabetes mellitus. This chapter presents the results of the data analysis in the study:

Table 4.1 shows the socio-demographic characteristics of the sample. When it comes to age groups, the participants were mostly from the age group of 57 years and older (40,5%). The results showed that diabetes was more prevalent in females than in males (55%). The sample comprised almost all married patients (97,5%). As for the education level, a great majority of the participants were primary school graduates (43,5%). About 44% of the samples were housewives. The results also showed that monthly income of the participants was barely sufficient, which was approximately 54% or more than half. In terms of residence place, most of the patients were living in rural areas (61%). The number of family members in the house ranged between 6-10 members (49%). The number of children was mostly 1-2 (46%).

Table 4.1: Statistical distribution of the participants according to their demographic data.

Demographic data		n	%
Age	18 – 25 years	5	2,50
	26 – 33 years	3	1,50
	34 – 40 years	6	3,00
	41 – 48 years	38	19,00
	49 – 56 years	67	33,50
	57 years and older	81	40,50
Gender	Male	90	45,00
	Female	110	55,00
Marital status	Single	5	2,50
	Married	195	97,50
Level of education	Illiterate	11	5,5%
	Literate	66	33,0%
	Primary school	87	43,5%
	Intermediate	14	7,0%
	Secondary school	2	1,0%
	Institute or college	19	9,5%
	Postgraduate	1	0,5%
Occupation	Employed	30	15,00
	Housewife	88	44,00
	Self-employed	16	8,00
	Unemployed	29	14,50
	Retired	37	18,50
Monthly income	Sufficient	30	15,00
	Barely Sufficient	108	54,00
	Insufficient	62	31,00
Residence place	Urban	78	39,00
	Rural	122	61,00
Number of family members in the house	1 - 5	30	15,00
	6 - 10	98	49,00
	11 and More	72	36,00
Number of children	None	19	9,50
	1 - 2	92	46,00
	3 - 4	63	31,50
	5 and More	26	13,00
Total		200	100%

Table 4.2: Statistical distribution of the participants according to their clinical data

Clinical data		n	%
Type of Diabetic	Type 1	78	39,00
	Type 2	122	61,00
Duration of the diabetes diagnosis	6-11 months	20	10,00
	1 year and more	180	90,00
Type of drug	Diet Regimen	22	11,00
	Oral hypoglycemic drug	119	59,50
	Insulin	59	29,50
The presence of chronic diseases	Heart disease and Hypertension	110	55,00
	Joint disease	39	19,50
	Eyes disease	42	21,00
	Kidney diseases	4	2,00
	none	5	2,50
Family history of Diabetes	Yes	106	53,00
	No	94	47,00
Smoking	Yes	33	16,50
	No	167	83,50
Duration of smoking	1 month to 11 months	2	1,00
	1 year to 4 years	3	1,50
	5 and More	28	14,00
Having a self-monitoring device for blood sugar	Yes	81	40,50
	No	119	59,50
If yes, who?	I measure myself	30	15,00
	My spouse	15	7,50
	My relatives	36	18,00
	Others	0	,00
How often do you measure blood sugar?	Daily	43	21,50
	Weekly	85	42,50
	Monthly	72	36,00
Body Mass Index	< 18.5	1	,50
	18.5 - 24.9	50	25,00
	25 - 29.9	100	50,00
	30 - 34.9	38	19,00
	35-40	11	5,50
	> 40	0	,00
Total		200	%100

Table 4.2 shows the medical data. The results showed that number of the patients with diabetes of the second type was higher than number of the patients with diabetes of the first type (61%), and the percentage of diabetes diagnosed for a year or more was 90%. While patients who used oral hypoglycemic drugs was 59,5%, those who used insulin was 29,5%. In terms of the presence of chronic diseases, some patients had mostly heart diseases and hypertension, which accounted for 55% of the diseases and more than half of the patients with diabetes had genetic diseases (53%). About 47% of the participants gave the answer "no," that is, there was no genetic disease.

When it comes to smoking, the majority of the participants (83,5%) were non-smokers, while 16,5% of them were smokers. All the participants did not consume alcohol (100%). The rate of patients who had a device for measuring blood glucose was 40,5%. The rates of patients who measured their blood glucose daily, weekly, and monthly were 21,5%, 42,5%, and 36%. The results showed that the body mass index of 25-29,9 had the highest percentage (50%).

Table 4.3: Statistical distribution of Quality of Life Domains.

Quality of Life Domains		n	%	Mean $\pm$ SD
1- Physical health	Poor	11	5.5	54,95 $\pm$ 12,67
	Moderate	159	79.5	
	Good	30	15.0	
2- Psychological	Poor	12	6.0	57,53 $\pm$ 13,97
	Moderate	128	64.0	
	Good	60	30.0	
3- Social	Poor	4	2.0	72,86 $\pm$ 14,08
	Moderate	30	15.0	
	Good	166	83.0	
4- Environmental	Poor	7	3.5	57,65 $\pm$ 12,44
	Moderate	146	73.0	
	Good	47	23.5	
Overall Quality of Life domains	Poor	5	2.5	60,72 $\pm$ 10,46
	Moderate	139	69.5	
	Good	56	28.0	
Total		200	100%	

Abbreviation: SD=Standard Deviation

Table 4.3 demonstrates the distribution of descriptive statistics for the domains of QoL according to patients' overall quality of life. This table confirms that the highest mean in the social domain (Mean $\pm$ SD=72,86 $\pm$ 14,08), while the lowest mean of score was seen in physical domain (Mean $\pm$ SD=54,95 $\pm$ 12,67).

Table 4.4: Correlation between demographic data and Quality of life scores according to demographic categories.

Demographic data		n	Mean $\pm$ SD	p
Age	18 – 25 years	5	60,11 $\pm$ 3,46	0,969
	26 – 33 years	3	55,52 $\pm$ 1,64	
	34 – 40 years	6	60,23 $\pm$ 2,36	
	41 – 48 years	38	62,45 $\pm$ 1,61	
	49 – 56 years	67	60,24 $\pm$ 1,95	
	57 years and older	81	60,32 $\pm$ 1,81	
Gender	Male	90	61,73 $\pm$ 2,14	0,003
	Female	110	60,14 $\pm$ 1,53	
Marital status	Single	5	60,15 $\pm$ 2,87	0,762
	Married	195	61,25 $\pm$ 3,34	
Level of education	Illiterate	11	60,33 $\pm$ 1,63 ^a	0,019
	Literate	66	58,67 $\pm$ 1,72 ^a	
	Primary school	88	61,76 $\pm$ 1,65 ^a	
	Intermediate	14	59,55 $\pm$ 2,84 ^{ab}	
	Secondary school	2	60,32 $\pm$ 1,78 ^a	
	Institute or college graduate	19	63,78 $\pm$ 2,06 ^c	
	Postgraduate	1	60,44 $\pm$ 0 ^{abc}	
Occupation	Employed	30	63,18 $\pm$ 2,21 ^a	0,009
	Housewife	88	60,03 $\pm$ 1,50 ^{be}	
	Self-employed	16	63,02 $\pm$ 1,83 ^{ac}	
	Unemployed	29	54,83 $\pm$ 1,87 ^{bd}	
	Retired	37	60,27 $\pm$ 2,12 ^{ade}	
Monthly income	Sufficient	30	65,69 $\pm$ 1,93 ^a	<0,0001
	Barely Sufficient	108	60,25 $\pm$ 1,77 ^b	
	Insufficient	62	56,70 $\pm$ 1,65 ^{bc}	
Residence place	Urban	78	64,86 $\pm$ 2,04	<0,0001
	Rural	122	55,93 $\pm$ 1,66	
Number of family members in the house	1 - 5	30	55,61 $\pm$ 2,08	0,072
	6 - 10	98	60,33 $\pm$ 1,84	
	11 and More	72	60,53 $\pm$ 1,75	
Number of children	None	19	56,35 $\pm$ 1,66 ^a	0,031
	1 - 2	92	60,19 $\pm$ 1,86 ^a	
	3 - 4	63	60,48 $\pm$ 1,92 ^a	
	5 and More	26	64,93 $\pm$ 1,65 ^b	
Total		200		

Abbreviations: P =probability value was calculated by using t-test in two groups and using One-way ANOVA in three or more groups; *= Significant if the p-value $\leq 0,05$, **= High Significant if the p-value $\leq 0,01$; abc= there was a significant difference, if the letters were different between groups, and there is no significant difference if the letters were the same.

Table 4.4 shows the correlation between demographic data and quality of life scores according to demographic categories. There was no statistically significant correlation in terms of age, marital status, number of family members in the home (P. = 0,969, 0,762, 0,072 respectively at $P > 0,05$). there was a significant difference only between gender, education level, occupation, monthly income, residence place, and number of children (P = 0,003, 0,019, 0,009, $<0,0001$, $<0,0001$, and 0,031).

Table 4.5: Correlation between clinical data and quality of life scores according to clinical categories.

Clinical data		n	Mean $\pm$ SD	p
Type of Diabetes	Type 1	78	60,24 $\pm$ 1,96	0,756
	Type 2	122	61,33 $\pm$ 1,81	
Duration of the diabetes diagnosis	6-11 month	20	60,51 $\pm$ 1,57	0,593
	1 year and more	180	60,27 $\pm$ 1,90	
Type of drug	Diet Regimen	22	64,35 $\pm$ 2,11 ^a	0,012
	Oral hypoglycemic drug	119	58,08 $\pm$ 1,62 ^b	
	Insulin	59	62,34 $\pm$ 2,11 ^{ab}	
Presence of chronic diseases	Heart disease and Hypertension	110	60,12 $\pm$ 1,64 ^a	0,025
	Joint disease	39	66,09 $\pm$ 1,83 ^b	
	Eyes disease	42	60,09 $\pm$ 2,22 ^a	
	Kidney diseases	4	49,94 $\pm$ 2,58 ^a	
	No disease	5	60,84 $\pm$ 1,62 ^a	
Family history of Diabetes	Yes	106	60,25 $\pm$ 1,97	0,708
	No	94	60,85 $\pm$ 1,74	
Duration of smoking	1 month to 11 months	2	42,74 $\pm$ 3,31	0,530
	1 year to 4 years	3	67,31 $\pm$ 4,10	
	5 and More	28	60,07 $\pm$ 2,42	
Do you have any device for measuring blood glucose?	Yes	81	60,88 $\pm$ 2,00	0,257
	No	119	60,17 $\pm$ 1,76	
If yes, who?	I measure myself	30	64,31 $\pm$ 1,93 ^a	0,009
	My spouse	15	58,97 $\pm$ 2,22 ^b	
	My relatives	36	59,89 $\pm$ 1,91 ^b	
	Others	0	0	
How often do you measure blood glucose?	Daily	43	60,43 $\pm$ 1,86	0,581
	Weekly	85	60,38 $\pm$ 1,82	
	Monthly	72	60,11 $\pm$ 1,93	
Body Mass Index	< 18.5	1	9,93 $\pm$ 0	0,081
	18.5 - 24.9	50	58,73 $\pm$ 1,84	
	25 - 29.9	100	60,53 $\pm$ 1,94	
	30 - 34.9	38	62,65 $\pm$ 1,52	
	35-40	11	58,77 $\pm$ 1,68	
	> 40	0	0	
Total		200		

Abbreviations: P =probability value was calculated by using t-test in two groups and using One-way ANOVA in three or more groups; *= Significant if the p-value $\leq$ 0,05, **= Highly Significant if the p-value $\leq$ 0,01; abc= there is a significant difference, if the letters were different between groups, and there is no significant difference if the letters were the same.

Table 4.5 shows the correlation between clinical data and quality of life scores according to clinical categories. There was no statistically significant correlation in terms of type of diabetes, duration of the diabetes diagnosis, family history of diabetes, duration of smoking, presence of any device used for measuring blood glucose, frequency of measuring blood glucose and body mass Index ($P = 0,756, 0,593, 0,708, 0,511, 0,530, 0,257, 0,581$ and $0,081$, respectively at $P > 0,05$) Only there were a significant difference between type of drug, presence of chronic diseases, If yes, who ($P = 0,012, 0,025$, and $0,009$).



5. DISCUSSION

This chapter discusses about the quality of life of people with diabetes.

Part-I: Discussion of the Socio-Demographic Data of Patients with DM:

The current study aimed to describe the picture of diabetic patients from several aspects. The findings of the study showed that the participants were mostly from the age group of 57 years and older, (40,5%) and this result may indicate that the incidence of diabetes increases with age. This study is compatible with the results of a previous study (Gholami et al., 2013).

The results of the study indicated that the majority of the participants were female (55%). These findings are compatible with other findings from a number of previous studies (Albikawi and Abuadas, 2015; Hailu, Mariam, Belachew and Birhanu, 2012; Hilawe, Yatsuya, Kawaguchi and Aoyama, 2013; Shrivastava and Kumar, 2015). This could be because there were more women than men over 50, some of whom were widowed, overweight or obese and had a low level of education.

The results of the study showed that the majority of people with diabetes were married (97,5%). These results are similar to two other studies (Berhe, Demissie, Kahsay and Gebru, 2012; Shihabudheen, Prasanth, Dilip, Danisha and Zainul, 2010). Marital status did not change as a result of diabetes. The patient and his wife's relationship was the same before and after they were diagnosed with diabetes; this occurred because the patient and his wife's strong social relationship is one of the main features of Iraqi society, which helped the patient and his wife overcome the difficulties they faced in life together.

When examining distribution of education level of the sample, it was determined that the majority of the sample were primary school graduates (43,5%). The current study showed that patients with higher education level had better quality of life scores. This information is also consistent with other studies showing positive effects on improving QoL in patients with diabetes. This is because they have

become more aware of what the disease is and are looking for other ways to better control and treat the disease (Quah, Luo, Ng, How and Tay 2013). People who had a low level of education had no sufficient knowledge about the illness and its effects on their health, so it didn't have a major effect on their QoL.

Regarding occupation variable, the sample distribution showed that the housewives participating in the study had the highest percentage (44%), This result is also compatible with the results of another study (Raithatha, Shankar and Dinesh, 2014) indicating that most of women with advanced age chose to work at home, because they have alterations in their physical status.

The current study revealed that most of the people in the sample had a barely sufficient monthly income (54%) and this result is consistent with the results obtained from a previous study (Puspasar and Farera, 2021) reporting that most of the participants had an adequate monthly income to buy medicines and make a specific diet and meet their daily needs.

When examining residence place, the current study's findings revealed that the majority of the participants (61%) were living in rural areas and this is compatible with a previous study (Gupta, Kapoor and Sood, 2019). It is not compatible with the result of two studies (Hamza, Mahmoud and Elgendy 2016; Muhammad Ali and Hamza, 2016). Rural diabetics suffer from various disturbances, imbalances in diet, difficulty in performing duties, adherence to medication, and recreation. It was also observed that diabetic patients did not receive proper care, advice, or recommendation regarding the course of the disease that could enhance their QoL, due to lack of knowledge about the disease or education level. Letassy, Armor, Britton and Farmer (2003) stated that some people with diabetes feel that it's more difficult to sleep in rural areas as opposed to urban ones. This is due to the change in the environment from urban to rural areas and it may be a part of getting used to their nighttime routine and falling asleep again. It may also be due to concerns about weather during the night (Kumait, 2014).

The distribution of the participants in terms of the number of family members shows that this variable had a significant correlation with social relations domain of QoL only. Older adults Aose family ties in our society. The shorter the period of

illness, the more favorable the QoL. This result confirms the results of the study by Hussain, Khthar and Al-Hadithi (2011).

The present study showed that the number of children was mostly 1-2 children (46%). This leads to happiness among family members to reduce some pressures and various psychological and social problems and to enjoy life with them, and that a good relationship with children increases the morale of the diabetic patient towards the disease, so it increases the quality of life of . The current study is somewhat similar to the study (Khayat et al., 2019).

Part-II: Discussion of the clinical characteristics of the patients with DM:

The results of this study showed that the number of people with T2DM considerably increased (61%) with advanced age, in contrast to T1DM. Adults are more likely to develop type 2. It is expected result that patients with T2DM are in the majority both in this study and in the Kumait (2014) study / can be interpreted as a result.

In terms of the duration of the disease, the present study revealed that the highest rate (90%) belonged to those suffering from the disease for one year or more. The findings are compatible with the study by Rajasekharan et al, 2015 and Satyawali et al., 2016. The participants were diagnosed with the disease mostly for 1 to 10 years.

The results of this study showed that in terms of the method of treatment, the highest rate (59,5%) was detected in those who were taking oral drugs and 29,5% of the participants were taking the drug by injection. Medicines or dosages are administered to the patient at the periods specified. The medicine can be administered gradually and consistently for numerous hours, days, or even weeks. As a result, medication levels in the blood can remain relatively consistent. This finding is compatible with a previous study. (Mohammed-Ali and Hamza, 2016).

Likewise, the current result showed that 55% of the participants suffered from chronic diseases. In this study, more than half of the people who had problems had high blood pressure and heart problems. Both the CDC and the NIDDDSK published data in 2005 that coincidentally happens to support this finding (Mohammed-Ali and Hamza, 2016). This is compatible with the results of the study, which indicated that

people who were smokers were more likely to have lung cancer than those who were not (Mohammed-Ali and Hamza, 2016).

When examining the family history, the results of the study indicated that 0-47% of the fathers and the mothers who participated in the study had a positive family history. This is based on the results of other studies (Svartholm and Nylander, 2010).

The study revealed that most patients (83,5%) were not smokers and a few (16,5%) were smoking 30-60 cigarettes a day, which was bad for diabetics. In their study, Raithatha, Shankar and Dinesh (2014) determined that 70,9% of the participants were non-smokers. It has been proven that smoking tobacco can cause an increase in blood glucose and insulin resistance. When compared to non-smokers, heavy smokers have a higher risk of getting diabetes. The urea-albuminuria associated with nephropathy can be exacerbated by tobacco use, for this reason, the low number of smokers in the study is pleasing in terms of not increasing the risk of cardiovascular complications in these people (Raithatha, Shankar and Dinesh, 2014)

The results of the present study indicated that some patients (40,5%) used a blood glucose meter to measure their glucose level because they were elderly or residing in rural areas and they find it difficult to reach hospitals or clinics due to some medical conditions. Also lack of monthly income may prevent them from reviewing their glucose level at the certain times, even though some other patients measured their glucose levels daily (21,5%), weekly (42,5%), and monthly (36%). A similar study was not found in the literature.

The results of the present study showed that the body mass index of 25 – 29,9 was detected mostly in the half of the participants (50%) and the results were consistent with a similar study (Chin-Hsiao, 2019). Obesity was shown to have a detrimental effect on individuals with diabetes in the study by Hayes et al., (2016). Also a higher BMI was associated with diabetes in the present study. This finding is compatible with several previous studies (Kueh, Morris and Ismail, 2017). The present study revealed that people with complications of diabetes had a lower quality of life.

Part-III: Discussion of quality of life domains for patients with DM:

The physical domain of quality of life includes such as energy, fatigue, pain, insomnia, mobility, sleep or rest, and the ability of a diabetic to work. It was found that many diabetic patients had the lowest quality of life when it came to their bodies. In general, a person's physical condition changes depending on how sick they are and how many other things are going on in their lives. Being an elderly and a female has an effect on the physical domain. Most of the participants were over 45 years old. Then, they got older and their bodily functions started to go down. Age was associated with higher blood glucose levels and a poor ability to use glucose. It could have a great impact on their daily lives, energy use, and mobility. Exercise is very important for people with diabetes (Sepúlveda et al., 2015).

As for the psychological domain of QoL, the present study revealed that the majority of patients got a fair score, and this finding is compatible with a study conducted by Hussain, Khther, and Al-Hadithi (2011). The psychological domain is the state of an individual's feelings and spirit including his feelings about himself, positive and negative feelings, spirituality, the ability to think, and the ability to focus. Mental health affects how well their live and how you react to things. It has been found from previous studies and research on the correlation between QoL and DM that the good psychological adjustment of patients depends on the family members who support this and the family is a major source of support. It is the best reflection of the patient's psychological adjustment to the disease (Yousif-Almkhtar and Abdul-Aziz Mostafa, 2012).

In the domain of social relationships in this study, diabetics became very satisfied with the support they received from their family, friends or relatives. This is compatible with previous studies (Islam et al., 2013). Having diabetes has made it so important for patients to get help from others or the environment. It would be good to improve people's morale and make them more determined to manage and treat their ailments. Patients are more optimistic about life when their closest friends and family would help them when they are having problems with their health. This study is consistent with a study conducted by Puspasari and Farera (2021).

Regarding the environmental domain, the present study showed that the majority of patients got a fair score. However, this is compatible with a previous study conducted by Al-Tukmagi and Moussa (2014). The environmental domain is a

way of looking at how people spend their time indoors and outdoors and in their physical world around them. Financial resources, freedom, security and safety were important to them, as well as the urgent need for new information and transportation. All of the results revealed that an individual variable, analysis of quality of life was based on the environment.

Part- IV: Discussion of the correlation between the patients' QoL and demographic data:

It was observed that there was a significant correlation between the QoL domains of diabetic patients and their gender. When examining QoL scores based on gender, it was determined that scores of QoL domains were higher in male patients than female patients since they were more concerned with their health and QoL. This difference may be associated with the fact that females were fatter, were doing less exercise, or consumed less healthy food, resulting in impairing their HRQoL. This present study is compatible with some previous studies (Alavi, Ghofranipour, Ahmadi and Emami, 2007; Eljedi, Mikolajczyk, Kraemer and Laaser, 2006; Hussein, Khther and Al-Hadithi, 2011) but it is not compatible with the study by Al-Rasheedi (2014).

The study revealed that there was a significant correlation between the QoL domains of diabetic patients and their education levels. Their educational levels were associated with health status, which indicated that education is important even if it doesn't have a direct relationship with financial status. The correlation between education and HRQoL has been thought to be partly associated with the correlation between higher levels of education and healthy lifestyles, such as stopping smoking, doing more exercise, and having better access to healthy foods. Many people think that education could also have an effect on how well people with diabetes communicate with their healthcare providers, how well they follow complicated self-care regimens, and how well they have a good quality of life (HRQoL) (Brown, Gillooly, Allen, Savage and West, 2004). According to Varghese, Salini, Abraham, Reeshma and Vijayakumar (2007), the only other socio-demographic variable associated with five of the six QoL domains is education level. Diabetics having a higher level of education may have a stronger social support, positive self-esteem, and a better understanding concerning their disease, its treatment, and its

consequences, even though there are conflicting data about this correlation (Mohan, Sandeep, Deepa, Shah and Varghese, 2007). Traits that may help patients develop a good outlook and solid understanding regarding treatment adherence.

The present study revealed that there was a correlation between the QoL domains and occupations of diabetic patients. Environmental satisfaction, psychological well-being, and a great proportion of social well-being were all associated with occupation of patients even if they had low scores. Because the occupation may make them forget what they think about because of their illness, and it may also suffice even a small part of the requirements of their daily lives. To break the cycle of low workmanship, low income, and poor QoL that may be exacerbated among diabetic patients, these individuals or patients need attention and these results are not compatible with some studies (Al-Shehri, Taha, Bahnassy and Salah, 2008; Algersha and Jasim, 2012).

It was observed that there was a significant correlation between QoL and monthly income of diabetic patients. It was determined in the present study that the majority of participants had a barely sufficient income, although monthly family income does not mean that higher QoL is positively associated with adequate or higher monthly family income, which is consistent with the study by Guillausseau (2005). Some studies have reported that poverty is an important indicator of the health status. A comprehensive and representative study by Glasgow, Ruggiero, Eakin, Dryfoos and Chobanian (1997) indicated that poverty is an indicator of a danger to the health and psychological state, which leads to high blood glucose. The medical outcomes study on health-related QoL among diabetes in the United States revealed a similar correlation between low income and poor QoL for physical, social, psychological and environmental domains of the Quality of Life Questionnaire.

It was observed that there was a significant correlation between QoL domains and residence place of patients with diabetes. The results of the current study indicated that the majority of diabetic patients in the rural and urban community coexisted with the disease, especially in rural areas because of their relationships and many encounters between family members and relatives. A sufficient income helps patients meet their needs in general. Social relations in general in the countryside of Iraq may be high, and the movement in the countryside may be good and the environment has wilderness features due to its large geographical area, and this may

contribute to the formation of a good QoL for patients. This finding is inconsistent with a study (Thommasen, Berkowitz, Thommasen and Michalos, 2005)

It was observed that there was a significant correlation between the QoL domains and the number of children of diabetic patients. The results indicated that children have an important and significant role in amusing diabetic patients and building a good family that coexists with the disease. The current study showed that the greater the number of children, the higher the relationship with the QoL for diabetics. A similar study was not found in the literature.

Part-V: Discussion of the correlation between the patients' QoL and clinical data:

It was observed that QoL domains had a statistically significant correlation with the variables of type of drugs used, the presence of chronic diseases and the person measuring the level of blood glucose (if yes) for patients with diabetes. It was found based on results of the current study that most of the diabetic patients attended a cooking class for diabetes and were committed to managing their diabetes by following a healthy diet and committing to some daily physical activities. Patients need to maintain a healthy weight to become a high QoL patient. Most of them monitor their blood glucose level and follow the doctor's instructions. However, they need to make sure to take medications, whether diet, oral or injectable therapy, as instructed by their doctor. It was also observed that most of them avoided smoking, were taking care of their mouth, teeth, and feet, were staying away from harmful alcoholic beverages, and attached importance to control their blood pressure and cholesterol levels. The results of the studies demonstrate that these patients should move forward in life and obtain the successes achieved as if it occurs without any trouble. They should deal with diabetes and chronic diseases by coexisting with them and through some chronic treatments, control its course properly and act with these diseases based on their nature. They should handle its risks according to their own self-care. (Al-Tukmagi, 2017; Arnold et al., 2004; Poss, Jezewski and Stuart, 2003)

6. CONCLUSION AND RECOMMENDATIONS:

6.1. Conclusion:

The following conclusions can be drawn from this study:

1. The age group of 57 years and above was the highest in all diabetic patients, and it was more prevalent among females, and the sample included almost all married patients.
2. The educational level of the participants was mostly primary school and housewives were the most affected. Also the financial situation of the diabetics was barely sufficient.
3. Regarding residence place, most of the patients were living in rural areas. And the number of family members ranged between 6-10 individuals, and the number of children was 1-2 children and more, the number of the participants with type two diabetes was more than the number of those with type one and was mostly using oral hypoglycemic drugs.
4. Some patients had chronic diseases and more than half of people with diabetes had genetic diseases. Regarding smoking, the majority of the participants were non-smokers.
5. It was also observed that the majority of patients with chronic diabetes who were receiving treatment enjoyed a high quality of life in the social sphere.
6. In most of cases with chronic diabetes, patients who responded to treatment had a low level of physical activity.
7. The quality of life had a strong correlation with gender, education level, occupation, monthly income, residence place, number of children, type of medication, presence of chronic diseases, and the person measuring the level of blood glucose (if yes) for patients undergoing diabetes treatment.

8. Middle-aged and elderly people were more likely to be obese, the information obtained about the disease was acceptable, but the safety precautions against the disease were poor.

6.2. Recommendations:

It is possible to make these recommendations based on the study's findings:

1. It is suggested to encourage the media and some health education programs related to diabetes and their QoL through the media in the community.
2. The Iraqi Ministry of Health needs to emphasize the provision of necessary medicines and supplies, especially insulin of all kinds, and chronic treatments for all diabetic patients.
3. It is suggested to take into account diet and sports activity as a means of treatment in motivating and encouraging patients.
4. Handbooks for the care and education of people with diabetes should be provided in a comprehensive language.
5. It is suggested to encourage group therapy among patients in order to share disease-related information and precautions.
6. Comprehensive studies should be conducted to investigate the barriers and factors affecting the lives of diabetic patients
7. It is essential for diabetics to wear an identification (ID) indicating their disease information especially during therapy and medication.
8. The services of the diabetes centers should extend to all people in or around in the Sharqat city and they must have some specialists working in this center such as neurologist, urologist, ophthalmologist, diabetes counselor, and orthopedist.
9. It is suggested to provide a training course for the Diabetic Staff in these centers with the assistance of the Ministry of Health.

REFERENCES

- Abd-Rabbo, S. (2017). Study of biochemical changes and lipid levels in diabetic patients. MSc. Thesis from Sebha University, 65 page, Sabha City.
- Ahmadi, K., Shahidi, S., Nejati, V., Karami, G., & Masoomi, M. (2013). Effects of Chronic Illness on the Quality of Life in Psychiatric out patients of the Iraq–Iran War. *Iranian journal of psychiatry*, 8(1), 7–13.
- Alam, U., Asghar, O., Azmi, S., & Malik, R. A. (2014). General aspects of diabetes mellitus. *Handbook of clinical neurology*, 126, 211-222. <https://doi.org/10.1016/B978-0-444-53480-4.00015-1>.
- Alavi, N. M., Ghofranipour, F., Ahmadi, F., & Emami, A. (2007). Developing a culturally valid and reliable quality of life questionnaire for diabetes mellitus. *EMHJ-Eastern Mediterranean Health Journal*, 13 (1), 177-185, 2007.
- Albikawi, Z. and Abuadas, M.(2015). : Diabetes Self Care Management Behaviors among Jordanian Type Two Diabetes Patients, *American International Journal of Contemporary Research*, 5(3), p.p. : 87-95.
- ALgersha, K. A., & Jasim, A. H. (2012). Assessment of Quality of Life for Patients with Diabetes Mellitus (type II). *journal of the college of basic education*, 18(73), 1-10.
- Alicic, R. Z., Rooney, M. T., & Tuttle, K. R. (2017). Diabetic kidney disease: challenges, progress, and possibilities. *Clinical Journal of the American Society of Nephrology*, 12(12), 2032-2045. <https://doi.org/10.2215/CJN.11491116>.
- Al-Rasheedi, A. A. S. (2014). The role of educational level in glycemic control among patients with type II diabetes mellitus. *International journal of health sciences*, 8(2), 177–187. <https://doi.org/10.12816%2F0006084>.
- Al-Shehri, A. H., Taha, A. Z., Bahnassy, A. A., & Salah, M. (2008). Health-related quality of life in type 2 diabetic patients. *Annals of Saudi medicine*, 28(5), 352-360..<https://doi.org/10.5144/0256-4947.2008.352/>
- Altahan, Y. M., & Fadhil, N. N. (2016). Assessment of Nurses' Knowledge and Attitude about Hypoglycemia at Mosul City Hospital. *Mosul Journal of Nursing*, 4(2), 74-80. DOI: 10.33899/mjn.2016.160040.
- Al-Tukmagi, H. F. (2017). Assessing Quality of Life Among Patients with Diabetes Mellitus, Hypertension or Both Diseases in Al-Najaf Province/Iraq. *Iraqi Journal of Pharmaceutical Sciences (P-ISSN: 1683-3597, E-ISSN: 2521-3512)*, 29-40.

- Al-Tukmagi, H. F., & Moussa, M. A. (2014). Quality of Life of Patients with Type II Diabetes Mellitus in Al-Hilla City-Iraq. *Iraqi Journal of Pharmaceutical Sciences (P-ISSN: 1683-3597, E-ISSN: 2521-3512)*, 23(2), 99-103. <https://doi.org/10.31351/vol23iss2pp99-103>.
- American Diabetes Association. (2010). Standards of medical care in diabetes—2010. *Diabetes care*, 33(Suppl 1), S11–S61. Doi: 10.2337/dc10-S011.
- American Diabetes Association. (2010a). Diagnosis and classification of diabetes mellitus. *Diabetes care*, 33(Supplement_1):S62–S69. <https://doi.org/10.2337/dc10-S062>.
- American Diabetes Association. (2013). Diagnosis and classification of diabetes mellitus. *Diabetes care*, 36(Suppl 1), S67–S74. <https://doi.org/10.2337/dc13-S067>.
- American Diabetes Association. (2013a). Standards of medical care in diabetes—2013. *Diabetes care*, 36(Supplement_1), S11–S66. <https://doi.org/10.2337/dc13-S011>.
- American Diabetes Association. (2014). Diagnosis and classification of diabetes mellitus. *Diabetes care*, 37(Supplement_1), S81-S90. <https://doi.org/10.2337/dc14-S081>.
- American Diabetes Association. (2015). Standards of medical care in diabetes abridged for primary care providers. *Clinical Diabetes: A publication of the American Diabetes Association*, 33(2), 97–111. Doi: 10.2337/diclin.33.2.97.
- American Diabetes Association. (2018). Classification and diagnosis of diabetes: standards of medical care in diabetes—2018. *Diabetes care*, 41(Supplement_1), S13-S27. <https://doi.org/10.2337/dc18-S002>.
- American Diabetes Association. (2018a). Economic costs of diabetes in the US in 2017. *Diabetes care*, 41(5), 917-928. <https://doi.org/10.2337/dci18-0007>.
- Arnold, R., Ranchor, A. V., Sanderman, R., Kempen, G. I. J. M., Ormel, J., & Suurmeijer, T. P. (2004). The relative contribution of domains of quality of life to overall quality of life for different chronic diseases. *Quality of life Research*, 13(5), 883-896. <https://doi.org/10.1023/B:QURE.0000025599.74923>.
- Asche, C., LaFleur, J., & Conner, C. (2011). A review of diabetes treatment adherence and the association with clinical and economic outcomes. *Clinical therapeutics*, 33(1), 74-109. <https://doi.org/10.1016/j.clinthera.2011.01.019>
- Berhe, K. K., Demissie, A., Kahsay, A. B., & Gebru, H. B. (2012). Diabetes self care practices and associated factors among type 2 diabetic patients in Tikur Anbessa specialized hospital, Addis Ababa, Ethiopia-a cross sectional study. *International Journal of Pharmaceutical Sciences and Research*, 3(11), 4219.
- Boada, C. C., & Martínez-Moreno, J. M. (2013). Current medical treatment of diabetes type 2 and long term morbidity: how to balance efficacy and safety?. *Nutrición hospitalaria*, 28(2), 3-13.

- Borgsteede, S. D., Westerman, M. J., Kok, I. L., Meeuse, J. C., de Vries, T. P., & Hugtenburg, J. G. (2011). Factors related to high and low levels of drug adherence according to patients with type 2 diabetes. *International Journal of Clinical Pharmacy*, 33(5), 779-787. <https://doi.org/10.1007/s11096-011-9534-x>.
- Brown, J. H., Gillooly, J. F., Allen, A. P., Savage, V. M., & West, G. B. (2004). Response to forum commentary on "toward a metabolic theory of ecology". *Ecology*, 85(7), 1818-1821.
- Carrillo-Larco, R. M., Barengo, N. C., Albitres-Flores, L., & Bernabe-Ortiz, A. (2019). The risk of mortality among people with type 2 diabetes in Latin America: A systematic review and meta-analysis of population-based cohort studies. *Diabetes/Metabolism Research and Reviews*, 35(4), 1-11. <https://doi.org/10.1002/dmrr.3139>.
- Chin-Hsiao, T. (2019). Metformin and the risk of dementia in type 2 diabetes patients. *Aging and disease*, 10(1), 37-48. <https://doi.org/10.14336%2FAD.2017.1202>
- Cho, M. K., & Kim, M. Y. (2021). What Affects Quality of Life for People with Type 1 Diabetes?: A Cross-Sectional Observational Study. *International Journal of Environmental Research and Public Health*, 18(14), 1-12. <https://doi.org/10.3390/ijerph18147623>.
- Choi, Y. J., & Chung, Y. S. (2016). Type 2 diabetes mellitus and bone fragility: special focus on bone imaging. *Osteoporosis and sarcopenia*, 2(1), 20-24. <https://doi.org/10.1016/j.afos.2016.02.001>.
- Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches* (4th ed.). London: Sage Publications Ltd. 8(2011), 107-121.
- D'Souza, M. S., Venkatesaperumal, R., Ruppert, S. D., Karkada, S. N., & Jacob, D. (2016). Health related quality of life among Omani men and women with type 2 diabetes. *Journal of Diabetes Research*, vol. Article ID 8293579, 10 pages. <https://doi.org/10.1155/2016/8293579>.
- Davies, A. & Buxton, C. (2015). Professional Nurses' Knowledge level on Type 2 Diabetes Mellitus at Selected Teaching and Training Hospitals in the Central Region of Ghana. *J Nurs Care*, 4(1):1-6. DOI: 10.4172/2167-1168.1000229.
- De Boer, I. H., Bangalore, S., Benetos, A., Davis, A. M., Michos, E. D., Muntner, P., ... & Bakris, G. (2017). Diabetes and hypertension: a position statement by the American Diabetes Association. *Diabetes Care*, 40(9), 1273-1284. <https://doi.org/10.2337/dci17-0026>.
- Delgado, M. M. (2018). Clinical case: complicated diabetic foot ulcer. *Revista española de sanidad penitenciaria*, 20(3), 121-124.

- Dunning, T., & Sinclair, A. (2014). The IDF global guideline for managing older people with type 2 diabetes: implications for nurses. *Journal of diabetes nursing*, 18(4), 145-150.
- Elhendi, M. Y. (2015). Assessment of Type 2 Diabetes management practice. MSc. Thesis, Sudan University, 66 page, Khartoum City.
- Eljedi, A., Mikolajczyk, R. T., Kraemer, A., & Laaser, U. (2006). Health-related quality of life in diabetic patients and controls without diabetes in refugee camps in the Gaza strip: a cross-sectional study. *BMC public health*, 6(1), 1-7. <https://doi.org/10.1186/1471-2458-6-268>.
- Estes, J. P., (2017). Diabetes, In B. J., Atchison. & D. P., Dirette (Eds.), *Conditions in Occupational Therapy: Effect on occupational performance* (5th ed.) (pp. 343-362). Philadelphia: Wolters Kluwer.
- Farmer, A. J., Perera, R., Ward, A., Heneghan, C., Oke, J., Barnett, A. H., ... & O'Malley, S. (2012). Meta-analysis of individual patient data in randomised trials of self monitoring of blood glucose in people with non-insulin treated type 2 diabetes. *BMJ*;344:e486, 1-11 doi: 10.1136/bmj.e486
- Gao, J., Wang, J., Zheng, P., Haardorfer, R., Kegler, C. M., Zhu, Y., & Hua, F.(2013). Effects of self-care, self-efficacy, social support on glycemic control in adults with type 2 diabetes. *BMC Family Practice*, 14(1), 66-71. Doi: 10.1186/1471-2296-14-66.
- German, M. S., Masharani, U., Gardner, D., & Shoback, D. (2011).Hormones and Diaetes Mellitus. Greenspan's Basic and Clinical Endocrinology. *McGraw Hill Medical*, 9th ed, 605 page, New York City.
- Gholami, A., Azini, M., Borji, A., Shirazi, F., Sharafi, Z., & Zarei, E. (2013). Quality of life in patients with type 2 diabetes: application of WHOQOL-BREF scale. *Shiraz E Med J*, 14(3), 162-171.
- Glasgow, R. E., Ruggiero, L., Eakin, E. G., Dryfoos, J., & Chobanian, L. (1997). Quality of life and associated characteristics in a large national sample of adults with diabetes. *Diabetes care*, 20(4), 562-567. <https://doi.org/10.2337/diacare.20.4.562>
- Godman. B., Malmstrom, RE., Diogene E, Gray, A., Jayathissa, S., Timoney, A. (2015). Are new models needed to optimize the utilization of new medicines to sustain healthcare systems? *Expert Review of Clinical Pharmacology*, 8(1:),77-94. <https://doi.org/10.1586/17512433.2015.990380>.
- Grintsova, O., Maier, W., & Mielck, A. (2014). Inequalities in health care among patients with type 2 diabetes by individual socio-economic status and regional deprivation: a systematic literature review. *International journal for equity in health*, 13(1), 1-14. <https://doi.org/10.1186/1475-9276-13-43>.

- Guillausseau, P. J. (2005). Impact of compliance with oral antihyperglycemic agents on health outcomes in type 2 diabetes mellitus. *Treatments in endocrinology*, 4(3), 167-175. <https://doi.org/10.2165/00024677-200504030-00005>.
- Gupta, J., Kapoor, D., & Sood, V. (2021). Quality of Life and its Determinants in Patients with Diabetes Mellitus from Two Health Institutions of Sub-himalayan Region of India. *Indian Journal of Endocrinology and Metabolism*, 25(3), 211–219. https://doi.org/10.4103%2Fijem.IJEM_246_21.
- Hailu, E., Mariam, W. H., Belachew, T., & Birhanu, Z. (2012). Self-care practice and glycaemic control amongst adults with diabetes at the Jimma University Specialized Hospital in south-west Ethiopia: A cross-sectional study. *African Journal of Primary Health Care and Family Medicine*, 4(1), 1-6. doi: 10.4102/phcfm.v4i1.311.
- Hamilton, H., Knudsen, G., Vaina, C. L., Smith, M., & Paul, S. P. (2017). Children and young people with diabetes: recognition and management. *British journal of nursing*, 26(6), 340-347. <https://doi.org/10.12968/bjon.2017.26.6.340>
- Hamza, M., Mahmoud, A. N., & Elgendy, I. Y. (2016). A randomized trial of complete versus culprit-only revascularization during primary percutaneous coronary intervention in diabetic patients with acute ST elevation myocardial infarction and multi vessel disease. *Journal of interventional cardiology*, 29(3), 241-247. <https://doi.org/10.1111/joic.12293>.
- Hara, Y., Hisatomi, M., Ito, H., Nakao, M., Tsuboi, K., & Ishihara, Y. (2014). Effects of gender, age, family support, and treatment on perceived stress and coping of patients with type 2 diabetes mellitus. *BioPsychoSocial medicine*, 8(1), 1-11. <https://doi.org/10.1186/1751-0759-8-16>.
- Hayes, A., Arima, H., Woodward, M., Chalmers, J., Poulter, N., Hamet, P., & Clarke, P. (2016). Changes in quality of life associated with complications of diabetes: results from the ADVANCE study. *Value in health*, 19(1), 36-41. <https://doi.org/10.1016/j.jval.2015.10.010>.
- Herath, H. M., Weerasinghe, N. P., Dias, H., & Weeraratna, T. P. (2017). Knowledge, attitude and practice related to diabetes mellitus among the general public in Galle district in Southern Sri Lanka: a pilot study. *BMC public health*, 17(1), 1-7. <https://doi.org/10.1186/s12889-017-4459-5>.
- Hilawe, E. H., Yatsuya, H., Kawaguchi, L., & Aoyama, A. (2013). Differences by sex in the prevalence of diabetes mellitus, impaired fasting glycaemia and impaired glucose tolerance in sub-Saharan Africa: a systematic review and meta-analysis. *Bulletin of the World Health Organization*, 91 (9), 671-682D. <https://doi.org/10.2471/BLT.12.113415>.

- Hussain, S., & Chowdhury, T. A. (2019). The impact of comorbidities on the pharmacological management of type 2 diabetes mellitus. *Drugs*, 79(3), 231-242. <https://doi.org/10.1007/s40265-019-1061-4>
- Hussein, R. N., Khther, S. A., & Al-Hadithi, T. S. (2011). Association of certain sociodemographic and clinical characteristics of diabetic patients with quality of life. *Zanco Journal of Medical Sciences (Zanco J Med Sci)*, 15(1), 35-42. <https://doi.org/10.15218/zjms.2011.0006>.
- Islam, S. M. S., Lechner, A., Ferrari, U., Froeschl, G., Niessen, L. W., Seissler, J., & Alam, D. S. (2013). Social and economic impact of diabetics in Bangladesh: protocol for a case-control study. *BMC Public Health*, 13(1), 1-9. <https://doi.org/10.1186/1471-2458-13-1217>.
- Iwanowicz-Palus, G., Zarajczyk, M., Pięta, B., & Bień, A. (2019). Quality of life, social support, acceptance of illness, and self-efficacy among pregnant women with hyperglycemia. *International Journal of Environmental Research and Public Health*, 16(20), 3941. 1-16. <https://doi.org/10.3390/ijerph16203941>.
- Karagiannis, T., Bekiari, E., Manolopoulos, K., Paletas, K., & Tsapas, A. (2011). Gestational diabetes mellitus: why screen and how to diagnose. *Hippokratia*, 14(3): 151–154.
- Keklik, D., Bayat, M., & Başdaş, Ö. (2020). Care burden and quality of life in mothers of children with type 1 diabetes mellitus. *International Journal of Diabetes in Developing Countries*, 40(3), 431-435. <https://doi.org/10.1007/s13410-020-00799-3>.
- Kerner, W., & Brückel, J. (2014). Definition, classification and diagnosis of diabetes mellitus. *Experimental and clinical endocrinology & diabetes*, 122(07), 384-386. DOI: 10.1055/s-0034-1366278.
- Kharroubi, A. T., & Darwish, H. M. (2015). Diabetes mellitus: The epidemic of the century. *World Journal of Diabetes*, 6(6): 850–867. <https://doi.org/10.4239%2Fwjcd.v6.i6.850>.
- Khayyat, S. M., Mohamed, M., Khayyat, S. M. S., Hyat Alhazmi, R. S., Korani, M. F., Allugmani, E. B., ... & Abdul Hadi, M. (2019). Association between medication adherence and quality of life of patients with diabetes and hypertension attending primary care clinics: a cross-sectional survey. *Quality of life research*, 28(4), 1053-1061. <https://doi.org/10.1007/s11136-018-2060-8>,
- Kueh, Y. C., Morris, T., & Ismail, A. A. S. (2017). Diabetes Knowledge, Attitudes, Self-management, and Quality of Life among People with Type 2 Diabetes Mellitus-A Comparison between Australia-and Malaysia-Based Samples. *Pertanika Journal of Science & Technology*, 25(1), 121 - 138
- Kumait, A. S. (2014). Quality of Life of Diabetic Patients Type-2-in Urban and Rural Areas in Kirkuk City (Comparative Study. *Mosul Journal of Nursing*, 2(1), 38-45.

- Lavdaniti, M., & Tsitsis, N. (2015). Definitions and conceptual models of quality of life in cancer patients. *Health Science Journal*, 9(2), 1-5.
- Lee, D. H., Won, G. W., Lee, Y. H., Ku, E. J., Oh, T. K., & Jeon, H. J. (2019). Associations between the HaeIII single nucleotide polymorphism in the SLC2A1 gene and diabetic nephropathy in Korean patients with type 2 diabetes mellitus. *Journal of Korean Medical Science*, 34(24). 1-10. <https://doi.org/10.3346/jkms.2019.34.e171>.
- Letassy, N. A., Armor, B. L., Britton, M., & Farmer, K. (2003). Pharmacist-managed diabetes service in a family medicine practice improves patient outcomes. *Drug Benefit Trends*, 15, 21-32.
- Levy, M.; Burns, R.J.; Deschênes, S.S.; Schmitz, N. (2017). Does social support moderate the association among major depression, generalized anxiety disorder, and functional disability in adults with diabetes? *Psychosomatics*, 58, 364–374. <https://doi.org/10.1016/j.psych.2017.03.004>.
- Lewis, G. F., & Brubaker, P. L. (2021). The discovery of insulin revisited: lessons for the modern era. *The Journal of Clinical Investigation*, 131(1),1-10 <https://doi.org/10.1172/JCI142239>
- Liu, Y., Li, J., Ma, J., & Tong, N. (2020). The threshold of the severity of diabetic retinopathy below which intensive glycemic control is beneficial in diabetic patients: estimation using data from large randomized clinical trials. *Journal of Diabetes Research*, vol. Article ID 8765139, 6 pages, <https://doi.org/10.1155/2020/8765139>
- Madmoli, M., Dehcheshmeh, Z. M., Rafi, A., Kord, Z., Mobarez, F., & Darabiyan, P. (2019). The rate of some complications and risk factors of diabetes in diabetic patients: Study on cases of 3218 diabetic patients. *Medical Science*, 23(95), 63-68.
- Mannarino, M., Tonelli, M., & Allan, G. M. (2013). Screening and diagnosis of type 2 diabetes with HbA1c. *Canadian Family Physician*, 59(1), 42-42.
- Marinho, F. S., Moram, C. B., Rodrigues, P. C., Franzoi, A. C., Salles, G. F., & Cardoso, C. R. (2016). Profile of disabilities and their associated factors in patients with type 2 diabetes evaluated by the Canadian occupational performance measure: the Rio De Janeiro type 2 diabetes cohort study. *Disability and Rehabilitation*, 38(21), 2095-2101.
- Matheka, M. F. (2017). Management of type 2 diabetes mellitus by diabetic clients. MSc. Thesis, Kenyatta University, 83 page, in Nyandarua County, Kenya City.
- Mathew, A., Anusree, T., Mathew, A., Archana, S., Athira, M., Sachina, B., & Gireesh, G. (2014). Quality of life among type-II diabetes mellitus patients in South India: A descriptive study. *Am Int J Res Humanit Arts Soc Sci*, 7, 197-200. <https://doi.org/10.2337/dci18-0007>.

- Megahed, F. I. A. E. L., (2018). Quality of life of type 2 diabetic patients attending family medicine outpatient clinic. MSc. Thesis, of Suez Canal university , 44 page, in Ismailia City.
- Mezil, S. A., & Abed, B. A. (2021). Complication of diabetes mellitus. *Annals of the Romanian Society for Cell Biology*, 25(3), 1546-1556.
- Mohammed-Ali, B. R., & Hamza, R. (2016). Assessment of self-care activities for patients' with diabetes mellitus type II. *Int. J. Sci. Res. Publ*, 6(9), 425-434.
- Mohan, V., Sandeep, S., Deepa, R., Shah, B., & Varghese, C. (2007). Epidemiology of type 2 diabetes: Indian scenario. *The Indian journal of medical research*, 125(3), 217-30.
- Myers, V. H., McVay, M. A., Brashear, M. M., Johannsen, N. M., Swift, D. L., Kramer, K., ... & Church, T. S. (2013). Exercise training and quality of life in individuals with type 2 diabetes: A randomized controlled trial. *Diabetes Care*, 36(7), 1884-1890.
- Nur, A. (2015). Glycemic control among type 2 diabetics. MSc. Thesis, Indiana State University, 56 page, Terre Haute City.
- Ogurtsova, K., da Rocha Fernandes, J. D., Huang, Y., Linnenkamp, U., Guariguata, L., Cho, N. H., ... & Makaroff, L. E. (2017). IDF Diabetes Atlas: Global estimates for the prevalence of diabetes for 2015 and 2040. *Diabetes research and clinical practice*, 128, 40-50. <https://doi.org/10.1016/j.diabres.2017.03.024>
- Ohaeri, J. U., & Awadalla, A. W. (2009). The reliability and validity of the short version of the WHO Quality of Life Instrument in an Arab general population. *Annals of Saudi medicine*, 29(2), 98-104.
- Osborne, S. P., & Brown, L. (2011). Innovation in public services: Engaging with risk. *Public Money & Management*, 31(1), 4-6. <https://doi.org/10.1080/09540962.2011.545532>.
- Oyenihi, A. B., Ayeleso, A. O., Mukwevho, E., & Masola, B. (2015). Antioxidant strategies in the management of diabetic neuropathy. *Biomed Res Int*, Article ID 515042, 15 pages <http://dx.doi.org/10.1155/2014/515042>
- Pisimisis, T. (2014). Quality of life of people with diabetes mellitus. MSc. Thesis, University London, 444 page, in Greece City.
- Porojan M., Costin S., Poanta L., Cerghizan A., Pop D., Dumitrascu D.L. (2010). Autonomic Neuropathy and Plasma Catecholamine in patients with Diabetes Mellitus, published in *.Rom. J. Intern. Med.*, 48(4) 341-345.
- Poss, J. E., Jezewski, M. A., & Stuart, A. G. (2003). Home remedies for type 2 diabetes used by Mexican Americans in El Paso, Texas. *Clinical Nursing Research*, 12(4), 304-323. <https://doi.org/10.1177%2F1054773803256872>.
- Powers, M. A., Bardsley, J., Cypress, M., Duker, P., Funnell, M. M., Hess Fischl, A., ... & Vivian, E. (2015). Diabetes self-management education and support in type 2 diabetes:

- a joint position statement of the American Diabetes Association, the American Association of Diabetes Educators, and the Academy of Nutrition and Dietetics. *Diabetes Care*, 38(7), 1372-1382. <https://doi.org/10.2337/dc15-0730>.
- Puspasari, S., & Farera, D. R. (2021). Quality of Life Among Patients with Type 2 Diabetic Mellitus in Outpatient Department, General Public Hospital, West Java. *KnE Life Sciences* 14 (1), 897-906.
- Quah, J. H., Luo, N., Ng, W. Y., How, C. H., & Tay, E. G. (2011). Health-related quality of life is associated with diabetic complications, but not with short-term diabetic control in primary care. *Annals of the Academy of Medicine-Singapore*, 40(6), 276-286.
- Raithatha, S. Shankar, S. Dinesh, K. (2014). Self-Care Practices among Diabetic Patients in Anand District of Gujarat, ISRN Family Medicine, Article ID 743791, p 1-6. <http://dx.doi.org/10.1155/2014/743791>.
- Rajasekharan, D., Kulkarni, V., Unnikrishnan, B., Kumar, N., Holla, R., & Thapar, R. (2015). Self care activities among patients with diabetes attending a tertiary care hospital in Mangalore Karnataka, India. *Annals of medical and health sciences research*, 5(1), 59-64. <https://doi.org/10.4103/2141-9248.149791>.
- Ramachandran, A. (2014). Know the signs and symptoms of diabetes. *The Indian Journal of Medical Research*, 140(5), 579–581.
- Riaz, M., Rehman, R. A., Hakeem, R., & Shaheen, F. (2013). Health related quality of life in patients with diabetes using SF-12 questionnaire. *J Diabetol*, 2(1), 1-7.
- Ritz, E., Zeng, X. X., & Rychlík, I. (2011). Clinical manifestation and natural history of diabetic nephropathy. *Diabetes and the Kidney*, 170, 19-27.
- Robert, A. A., & Al Dawish, M. A. (2020). The worrying trend of diabetes mellitus in Saudi Arabia: an urgent call to action. *Current Diabetes Reviews*, 16(3), 204-210. <https://doi.org/10.2174/1573399815666190531093735>.
- Roglic, G. (2016). WHO Global report on diabetes: A summary. *International Journal of Noncommunicable Diseases*, 1(1), 3-8.
- Saito, T., Watanabe, M., Nishida, J., Izumi, T., Omura, M., Takagi, T., ... & Zensharen Study for Prevention of Lifestyle Diseases Group. (2011). Lifestyle modification and prevention of type 2 diabetes in overweight Japanese with impaired fasting glucose levels: a randomized controlled trial. *Archives of internal medicine*, 171(15), 1352-1360. doi:10.1001/archinternmed.2011.275.
- Salah al-Din Health Directorate (2022). Annual periodic report Sharqat General Hospital, Statistics Department.
- Salvador-Carulla, L., Lucas, R., Ayuso-Mateos, J. L., & Miret, M. (2014). Use of the terms "Wellbeing" and "Quality of Life" in health sciences: a conceptual framework. *The*

- European Journal of Psychiatry*, 28(1), 50-65. <https://dx.doi.org/10.4321/S0213-61632014000100005>.
- Satyawali, V., Pandey, S., Sharma, V., Titiyal, G. S., Panwar, N., Kumar, P., & Joshi, V. (2016). Assessment of level of awareness for diabetes mellitus, its systemic and ocular complications: a questionnaire-based survey at tertiary care Centre of Kumaon Region. *J Evolution Med Dent Sci*, 5(68), 4856-4860.
- Schrieke, I. C., Nozza, A., Stähli, B. E., Buse, J. B., Henry, R. R., Malmberg, K., ... & Schwartz, G. G. (2018). Adiponectin, free fatty acids, and cardiovascular outcomes in patients with type 2 diabetes and acute coronary syndrome. *Diabetes care*, 41(8), 1792-1800. <https://doi.org/10.2337/dc18-0158>.
- Schwitzgebel, V. M. (2014). Many faces of monogenic diabetes. *Journal of diabetes investigation*, 5(2), 121-133. <https://doi.org/10.1111/jdi.12197>.
- Sepúlveda, E., Poínhos, R., Constante, M., Pais-Ribeiro, J., Freitas, P., & Carvalho, D. (2015). Health-related quality of life in type 1 and type 2 diabetic patients in a Portuguese central public hospital. *Diabetes, metabolic syndrome and obesity: targets and therapy*, 8, 219. doi: 10.2147/DMSO.S80472.
- Shihabudheen, K. M., Prasanth, N. V., Dilip, C., Danisha, P., & Zainul, A. (2010). Assessment of risk factors among type 2 diabetic populations in South Malabar region of Kerala. *Archives of Applied Science Research*, 2(4), 313-323.
- Shillo, P., Sloan, G., Greig, M., Hunt, L., Selvarajah, D., Elliott, J., ... & Tesfaye, S. (2019). Painful and painless diabetic neuropathies: what is the difference?. *Current Diabetes Reports*, 19(6), 1-13. <https://doi.org/10.1007/s11892-019-1150-5>
- Shrivastava, P., & Kumar, R. (2015). Soil salinity: A serious environmental issue and plant growth promoting bacteria as one of the tools for its alleviation. *Saudi journal of biological sciences*, 22(2), 123-131. <https://doi.org/10.1016/j.sjbs.2014.12.001>.
- Shrivastava, S. R., Shrivastava, P. S., & Ramasamy, J. (2013). Role of self-care in management of diabetes mellitus. *Journal of Diabetes & Metabolic Disorders*, 12(1), 1-5. <https://doi.org/10.1186/2251-6581-12-14>.
- Silva, A. A., Souza, J. M. P. D., Borges, F. N. D. S., & Fischer, F. M. (2010). Health-related quality of life and working conditions among nursing providers. *Revista de Saúde Pública*, 44, 718-725. <https://doi.org/10.1590/S0034-89102010000400016>.
- Silver, B., Ramaiya, K., Andrew, S. B., Fredrick, O., Bajaj, S., Kalra, S., ... & Makhoba, A. (2018). EADSG guidelines: insulin therapy in diabetes. *Diabetes therapy*, 9(2), 449-492. <https://doi.org/10.1007/s13300-018-0384-6>.
- Smith, D. M., Donnelly, P. J., Howe, J., Mumford, T., Campbell, A., Ruddock, A., ... & Wearden, A. (2018). A qualitative interview study of people living with well-

- controlled type 1 diabetes. *Psychology & health*, 33(7), 872-88. <https://doi.org/10.1080/08870446.2017.1423313>.
- Spasić, A., Veličković-Radovanović, R., Catić-Đorđević, A., Stefanović, N., & Cvetković, T. (2014). Quality of life in type 2 diabetic patients. *Acta Facultatis Medicae Naissensis*, 31(3), 193-200. DOI: 10.2478/afmnai-2014-0024.
- Svartholm, S. and Nylander, E. (2010). Self-care activities of patients with Diabetes Mellitus Type 2. study. MSc. Thesis, Uppsala University, 47 page, in Ho Chi Minh City.
- Takian, A., & Kazempour-Ardebili, S. (2016). Diabetes dictating policy: an editorial commemorating world health day 2016. *International Journal of Health Policy and Management*, 5(10), 571–573. <https://doi.org/10.15171/ijhpm.2016.79>.
- Thommasen, H. V., Berkowitz, J., Thommasen, A. T., & Michalos, A. C. (2005). Understanding relationships between diabetes mellitus and health-related quality of life in a rural community. *Rural and remote health*, 5(3), 1-18.
- Thunander, M., Törn, C., Petersson, C., Ossiansson, B., Fornander, J., & Landin-Olsson, M. (2012). Levels of C-peptide, body mass index and age, and their usefulness in classification of diabetes in relation to autoimmunity, in adults with newly diagnosed diabetes in Kronoberg, Sweden. *European journal of endocrinology*, 166(6), 1021-1029. <https://doi.org/10.1530/EJE-11-0797>.
- Timar, R., Velea, I., Timar, B., Lungeanu, D., Oancea, C., Roman, D., & Mazilu, O. (2016). Factors influencing the quality of life perception in patients with type 2 diabetes mellitus. *Patient Preference and Adherence*, 10, 2471–2477. <https://doi.org/10.2147/PPA.S124858>.
- Unadike B.(2010). Awareness and knowledge about Diabetes Mellitus nursing students in the Niger Delta region of Nigeria. *Middle East J. Nursing*, 4(1),1834–8742.
- Unger, R. H., & Orci, L. (2010). Paracrinology of islets and the paracrinopathy of diabetes. *Proceedings of the National Academy of Sciences*, 107(37), 16009-16012. <https://doi.org/10.1073/pnas.1006639107>.
- Varghese, R. T., Salini, R., Abraham, P., Reeshma, K. K., & Vijayakumar, K. (2007). Determinants of the quality of life among diabetic subjects in Kerala, India. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, 1(3), 173-179. <https://doi.org/10.1016/j.dsx.2007.05.005>.
- Whiting, D. R., Guariguata, L., Weil, C., & Shaw, J. (2011). IDF diabetes atlas: global estimates of the prevalence of diabetes for 2011 and 2030. *Diabetes research and clinical practice*, 94(3), 311-321.
- Wing, R. R., Lang, W., Wadden, T. A., Safford, M., Knowler, W. C., Bertoni, A. G., ... & Look AHEAD Research Group. (2011). Benefits of modest weight loss in improving

- cardiovascular risk factors in overweight and obese individuals with type 2 diabetes. *Diabetes Care*, 34(7), 1481-1486. <https://doi.org/10.2337/dc10-2415>.
- Yousif Almkhtar, M., & Abdul Aziz Mostafa, W. (2012). Quality of life of patients with type 2 diabetes mellitus in Mosul. *Annals of the College of Medicine, Mosul*, 38(1), 20-26. <http://dx.doi.org/10.33899/mmed.2012.50049>.
- Yuen, L., & Wong, V. W. (2015). Gestational diabetes mellitus: challenges for different ethnic groups. *World Journal of Diabetes*, 6(8), 1024–1032. <https://doi.org/10.4239/wjd.v6.i8.1024>.
- Zhang, P. Y. (2014). Cardiovascular disease in diabetes. *Eur Rev Med Pharmacol Sci*, 18(15), 2205-2214.
- Zheng, Y., Ley, S. H., & Hu, F. B. (2018). Global aetiology and epidemiology of type 2 diabetes mellitus and its complications. *Nature Reviews Endocrinology*, 14(2), 88-98. <https://doi.org/10.1038/nrendo.2017.151>.
- Skevington, S. M., & Tucker, C. (1999). Designing response scales for cross-cultural use in health care: Data from the development of the UK WHOQOL. *British journal of medical psychology*, 72(1), 51-61. <https://doi.org/10.1348/000711299159817>.

APPENDIX 1: The Questionnaire of The Study (in the language of English and Arabic)

Dear Respondent:

Please take the time to read this document carefully

We invite you to participate in a study entitled "Factors Affecting The Quality of Life of Patients with Diabetes Mellitus" conducted by Harith AHMED MOHAMMED MOHAMMED. Before deciding whether or not to participate in this study, you need to know why and how to conduct the study. Therefore, it is crucial to read and understand this model. If you do not understand any point, or if you want more information, ask us. Participation in this study is completely optional and you have the right not to participate in the study or to withdraw from the study at any time. Your response will be interpreted as the fact that you give consent to participate in the study. Do not get pressured by anyone or do not take their suggestions while answering the questions on the forms. Personal information obtained from these forms will be kept strictly confidential and will be used for research purposes only.

Factors affecting the quality of life of patients with diabetes mellitus: A descriptive cross-sectional study.

Please answer the following questions provided that you are not pressured by anyone or do not take their suggestions. Personal information obtained from these forms will be kept strictly confidential and will be used for research purposes only. Thank you for your participation.

Part I: Demographic characteristics:

1. Age

18-25 years

26-33 years

34-40 years

41-48 years

49-56 years

- 57 years and more ☐
2. **Gender:** Male ☐ Female ☐
3. **Marital status:** single ☐ married ☐
4. **Level of Education:** Illiterate ☐ literate ☐
- Primary School graduate ☐ Intermediate graduate ☐
- Secondary school graduate ☐ Institute or College graduate ☐
- Postgraduate graduate ☐
5. **Occupation:** Employed ☐ Housewife ☐ self-employed ☐
- Unemployed ☐ Retired ☐
6. **Financial status:** Sufficient ☐ Barely Sufficient ☐ Insufficient ☐
7. **Residence:** Urban ☐ Rural ☐
8. **Number of family members in the house:** 1-5 ☐ 1-6 ☐
- 11 and more ☐
9. **Number of children:** 1-2 ☐ 3-4 ☐ 5 and more ☐

Part II: Medical characteristics:

1. **Type of Diabetes:** Type 1 ☐ Type 2 ☐
2. **Duration of the diabetes diagnosis:** 6-11 month ☐ 1 year and more ☐
3. **Type of drug:** Diet Regimen ☐ Oral hypoglycemic drug ☐ Insulin ☐
4. **Presence of chronic diseases:** Heart and Hypertension disease ☐ Joint ☐
- disease ☐ Eyes disease ☐ Kidney diseases ☐ none ☐

5. Family history of Diabetes:

Yes - ☐

No - ☐

6. Smoking:

Yes-

From 1 month to 11 months From 1 year to 4 years

5 and more

No -

7. Alcohol Consumption: Yes No

8. Do you have any device for measuring blood glucose:

Yes - I measure myself my spouse My relatives
the others

No -

9. How often do you measure blood glucose: Daily Weekly

Monthly

10. Body Mass Index: <18.5 18.5-24.9 25-29.9
30-34.9 35-40 > 40

Part III: World Health Organization Quality of Life (WHOQOL) – BREF

Please read the question and rate how you feel over the past two weeks and tick (✓) the best answer for you.

N	1tmes	Very poor	Poor	Neither poor nor good	Good	Very good
1	How would you rate your quality of life?					

N	1tmes	Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
2	How satisfied are you with your health?					

The following questions ask about your exposure to certain material in the last two weeks .

N	1tmes	Not at all	A little	A moderate amount	Very much	An extreme amount
3	To what extent do you feel that physical pain prevents you from doing what you need to do?					
4	How much do you need any medical treatment to function in your daily life?					

5	How much do you enjoy life?					
6	To what extent do you feel your life to be meaningful?					
7	How well are you able to concentrate?					
8	How safe do you feel in your daily life?					
9	How healthy is your physical environment?					

The following questions ask about your ability to perform certain things in the last two weeks .

N	1tmes	Not at all	A little	A moderate amount	Very much	An extreme amount
10	Do you have enough energy for everyday life?					
11	Are you able to accept your bodily appearance?					
12	Have you enough money to meet your needs?					
13	How available to you is the information you need in your daily life?					
14	To what extent do you have the opportunity for leisure activities?					

N	1tmes	Very poor	Poor	Neither poor nor good	Good	Very good
---	-------	-----------	------	-----------------------	------	-----------

15	How well are you able to get around physically?					
----	---	--	--	--	--	--

The following questions ask you to say how good or satisfied you have felt about various aspects of your life over the over the last two weeks.

N	1tmes	Very dissatisfie d	Very dissatisfie d	Very dissatisfie d	Very dissatisfie d	Very dissatisfie d
16	How satisfied are you with your sleep?					
17	How satisfied are you with your ability to perform your daily living activities?					
18	How satisfied are you with your capacity for work					
19	How satisfied are you with yourself?					
20	How satisfied are					

	you with your personal relationships ?					
21	How satisfied are you with your sex life?					
22	How satisfied are you with the support you get from your friends?					
23	How satisfied are you with the conditions of your living place?					
24	How satisfied are you with your access to health services?					
25	How satisfied are you with					

	your transport?					
--	----------------------------	--	--	--	--	--

The following question refers to how often you have feeling or exposure to certain thing in the last two weeks.

N	Items	Never	Infrequently	Sometimes	Frequently	Always
26	How often do you have negative feelings such as blue mood, despair, anxiety or depression?					

الاستبيان

عزيزي المشارك

يرجى أخذ الوقت الكافي لقراءة هذه الوثيقة بعناية

ندعوكم للمشاركة في بحث بعنوان " العوامل المؤثرة في نوعية الحياة مرضى السكري: دراسة وصفية مقطعية" الذي أجراه حارث احمد محمد محمد . قبل أن تقرر ما إذا كنت ستشارك في هذا البحث أم لا ، تحتاج إلى معرفة سبب وكيفية إجراء البحث. لذلك ، من المهم جدًا قراءة هذا النموذج وفهمه. إذا كان هناك شيء لا تفهمه وغير واضح لك ، أو إذا كنت تريد المزيد من المعلومات ، اسألنا. المشاركة في هذه الدراسة اختيارية تمامًا ، ولك الحق في عدم المشاركة في الدراسة أو الانسحاب من الدراسة في أي وقت بعد المشاركة. سيتم تفسير ردك على الدراسة على أنه موافقتك على المشاركة في الدراسة. لا تتعرض لضغط أو اقتراح من أي شخص أثناء الإجابة على الأسئلة الواردة في الاستمارات المقدمة لك. سيتم الاحتفاظ بالمعلومات الشخصية التي تم الحصول عليها من هذه النماذج سرية تمامًا وسيتم استخدامها لأغراض البحث فقط.

العنوان

العوامل المؤثرة على نوعية حياة مرضى السكري: دراسة وصفية مقطعية.

الجزء الاول: الخصائص الديموغرافية:

1. العمر:

أ- 18 - 25 سنة ☐

ب- 26 - 33 سنة ☐

ت- 34 - 40 سنة ☐

ث- 41 - 48 سنة ☐

ج- 49 - 56 سنة ☐

ح- 57 سنة فما فوق ☐

2. الجنس: ذكر ☐ أنثى ☐

3. الحالة الاجتماعية: أعزب ☐ متزوج ☐

4. المستوى التعليمي: امي ☐ يقرأ ويكتب ☐ خريج ابتدائية ☐ خريج متوسطة ☐

خريج اعدادية ☐ خريج معهد او كلية ☐ خريج دراسات عليا ☐

5. المهنة : موظف ☐ ربة بيت ☐ اعمال حره ☐ عاطل عن العمل ☐
متقاعد ☐

6. الدخل الشهري: جيد ☐ متوسط ☐ ضعيف ☐

7. مكان السكن: المدينة ☐ الريف ☐

8. عدد أفراد الاسرة في المنزل: 1-5 ☐ 6-10 ☐ 11 فما فوق ☐

9. عدد الاطفال: 1-2 ☐ 3-4 ☐ 5 فما فوق ☐

الجزء الثاني: الخصائص الطبية:

1. نوع مرض السكري: النوع الاول ☐ النوع الثاني ☐

2. مدة التشخيص لمرض السكر: 6-11 شهر ☐ 1 سنة فما فوق ☐

3. نوع الدواء: مجرد النظام الغذائي يكفي ☐ مضادات السكر عن طريق الفم ☐ الأنسولين ☐

4. هل لديك امراض مزمنة: امراض الضغط و القلب ☐ امراض المفاصل ☐ امراض العيون ☐

امراض الكلى ☐ لا يوجد امراض ☐

5. التاريخ العائلي لمرض السكري: نعم - ☐

كلا - ☐

6. هل تدخن: نعم- ☐

1 شهر الى 11 شهر ☐ 1سنة الى 4 سنوات ☐ 5 سنوات ☐

كلا- ☐

7. هل تشرب الخمر: نعم - ☐ كلا - ☐

8. هل لديك جهاز قياس نسبة السكر في الدم: نعم – أنا أقيس نفسي ☐ زوجي ☐ اقربائي ☐

الاخرين ☐

كلا – ☐

9. كم مرة تقيس نسبة السكر في الدم: يوميا ☐ اسبوعيا ☐ شهريا ☐

10. مؤشر كتلة الجسم :اقل من 18.5 ☐ 18.5 - 24.9 ☐ 25 - 29.9 ☐ 30 - 34.9 ☐

40 - 35 ☐ اكثر من 40 ☐

الجزء الثالث: منظمة الصحة العالمية جودة الحياة BREF – (WHOQOL)

يرجى قراءة كل سؤال وتقييم ما تشعر به ووضع علامة صح (√) على أفضل إجابة بالنسبة لك

التسلسل	الاسئلة	سيئة للغاية	سيئة	لا بأس	جيدة	جيدة جدا
1-	كيف تقيم نوعية حياتك ؟					

التسلسل	الاسئلة	غير راض على الإطلاق	غير راض	لا راض ولا غير راض	راض	راض تماما
2-	ما مدى رضاك عن صحتك ؟					

الأسئلة التالية تستفسر عن مدى تعرضك لأشياء معينة خلال الأسبوعين الماضيين

التسلسل	الاسئلة	لا يوجد	قليل	بدرجة متوسطة	كثير جدا	بدرجة بالغة
3-	إلى أي حد تشعر بأن الألم الجسدي يمنعك من القيام بالأعمال التي تريدها ؟					
4-	إلى أي مدى أنت بحاجة للعلاج الطبي لتتمكن من القيام بأعمالك اليومية ؟					
5-	إلى أي مدى تستمتع بالحياة ؟					
6-	إلى أي مدى تشعر بأن حياتك ذات معنى ؟					
7-	إلى أي مدى أنت قادر على التركيز ؟					
8-	إلى أي مدى تشعر بالأمان في حياتك اليومية ؟					
9-	إلى أي حد تعتبر أن البيئة المحيطة بك صحية ؟					

الأسئلة التالية تستفسر عن مدى قدرتك على إتمام أمور معينة خلال الأسبوعين الماضيين

التسلسل	الاسئلة	لا يوجد	قليلا	بدرجة متوسطة	كثير جدا	بدرجة بالغة
10-	هل لديك طاقة كافيه لمزاولة الحياة اليومية؟					
11-	هل أنت قادر على قبول مظهرك الخارجي؟					
12-	هل لديك من المال ما يكفي لتلبية احتياجاتك؟					
13-	ما مدى توفر المعلومات التي تحتاجها في حياتك اليومية ؟					
14-	إلى أي مدى لديك الفرصة لممارسة الأنشطة الترفيهية؟					

التسلسل	الاسئلة	سيئة للغاية	سيئة	لا بأس	جيدة	جيدة جد
15-	إلى أي مدى أنت قادر على التنقل بسهولة؟					

الأسئلة التالية تطلب منك أن تعبر عن مدى رضاك نحو جوانب مختلفة من حياتك خلال الأسبوعين الماضيين

التسلسل	الاسئلة	غير راض على الاطلاق	غير راض	لا راض ولا غير راض	راض	راض تماما
16-	كم أنت راض عن نومك ؟					
17-	إلى أي مدى أنت راض عن قدرتك على القيام بنشاطاتك اليومية ؟					
18-	كم أنت راض عن قدراتك على العمل ؟					
19-	كم أنت راض عن نفسك ؟					

					20- كم أنت راض عن علاقاتك الشخصية ؟
					21- كم أنت راض عن حياتك الجنسية ؟
					22- كم أنت راض عن الدعم أو المساعدة من الأصدقاء ؟
					23- كم أنت راض عن الأوضاع في مكان سكنك؟
					24- كم أنت راض عن الخدمات الصحية المتوفرة لك ؟
					25- كم أنت راض عن وسائل المواصلات التي تستخدمها ؟

الأسئلة التالية تشير إلى كم من المرات شعرت أو تعرضت فيها لأشياء معينة خلال الأسبوعين الماضيين

التسلسل	الاسئلة	أبد	نادرا	غالبا	غالبا جدا	دائما
26-	كم من المرات كانت لديك مشاعر سلبية مثل المزاج السيئ، اليأس، القلق، الاكتئاب؟					

APPENDIX 2: Approval of using the questionnaire (By E-mail)



APPENDIX 3: Search permissions:







APPENDIX 4: Ethical Approval of CAKU



CURRICULUM VITAE

Personal Information

Name and Surname : Harith AHMED MOHAMMED MOHAMMED

-
- Contact address and phone :
-
-
- WhatsApp and Viber and Telegram (Same Number Phone).

Education

Undergraduate Kirkuk University
Faculty of Health Sciences
Department of Internal Medicine Nursing

Work Experience

Year

2 year as a nurse

Institution

In the CCU, emergency
and operations
department At sharqat
General Hospital

Master student