Republic of Iraq

Ministry of Higher Education

and Scientific Research

University of Babylon

College of Nursing

Health Behaviours and its Relationship to Treatment Adherence among Type II Diabetic Patients

A Thesis Submitted to Council of College of Nursing, University of Babylon in partial fulfillment of the requirements for the Degree of Master in Nursing Sciences

By

Ahsan Jawad Riyah

Supervised by

Prof. Amean A. Yasir, PhD

October. 2023.AD **Rabi' al-Awwal. 1445.AH**

﴿ وَإِذَا مَرِضْتُ فَهُوَ يَشْفِينِ ﴾

صدق الله العظيم

سورة الشعراء آية (80)

Supervisor Certification

I certify that this thesis, entitled (**Health Behaviours and its Relationship to Treatment Adherence among Type II Diabetic Patients**), submitted by **Ahsan Jawad Riyah** was prepared under my supervision and guidance at the Department of Community Health Nursing, College of Nursing, University of Babylon as a partial fulfillment of the requirement for the Degree of Master in Nursing Sciences.

Supervisor

Prof. Amean A. Yasir, PhD

College of Nursing/ University of Babylon

Date: / / 2023

Signature

Head of Community Health Nursing

Prof. Amean A. Yasir, PhD

College of Nursing / University of Babylon

Date: / / 2023

Committee Certification

The examining committee, certify that we have read this Thesis (**Health Behaviours and its Relationship to Treatment Adherence among Type II Diabetic Patients**), which is submitted by (**Ahsan Jawad Riyah**) from the department Community Health Nursing, and we have examined the student in its contents, and what is related to it and we decide that it is adequate for awarding the degree of (Master) in nursing Sciences with speciality of family and community Health Nursing at an estimate of ( )

Signature:

Assist. Prof

Member

Date: / / 2023

Signature:

Assist. Prof

Member

Date: / / 2023

Signature

Chairman

Date: / / 2023

Approved by the council of the college of nursing

Signature

Prof. Amean A. Yasir, PhD

Dean of the College of Nursing/ University of Babylon

Date: / / 2023

Dedication

To

My father and mother with love and respect forever.

To

My brothers and sisters with all love and respect who support me to pursue my study.

To

My dear friends with respect.

Acknowledgements

Firstly, I would like to praise **Allah (the Great and Almighty)** prophet Mohammed, AL-Emam Ali and his immaculate household for giving me the strength and patience in completing this work and enabled me to fulfill this project.

I would like to submit my sincere thanks to my academic supervisor **Dr. Amean Ajil Yasser** for his helpful comments, valuable suggestions, advice and encouragement.

I would like to thank to Chairperson of **Family and Community Health Nursing Department**.

I would like to thank staff of the **College of Nursing and Library Staff in the College of Nursing /University of Babylon.**

My thank extended to **Babylon Health Directorate and all Patients** who agree to participated in the study

I gratefully acknowledge the endless generosity of the **Experts** in reviewing and evaluating the study instrument.

I would also like to recognize the positive efforts and assistance of the

Finally, ….

I pray to Allah (the Great and Almighty)

To bless them all.

Ahsan2023

Abstract

Diabetes mellitus is a major public health burden that requires immediate attention in order to sustain life, and healthy behaviors are a major determinant of adherence to treatment. This study aims to evaluate healthy behaviors and their relationship to adherence to treatment in patients with type 2 diabetes.

A descriptive correlational study was conducted in the Hilla city during the period from October 1st, 2022 to March 29th, 2023. The study sample consist of 200 patients was selected according to a non-probability sampling approach. The questionnaire was validated by experts and its reliability was validated by a pilot study. Data were collected through interviews and analyzed by applying descriptive and inferential statistical analysis.

The results indicated that the average age of the participants was 44.03 years, and most of them were females and college graduates. It was found that more than half of the study participants (59.5% and 88%) had poor health behaviors and poor treatment adherence. Adherence to treatment varies according to age, gender, monthly income, marital status, duration of diabetes mellitus and associated diseases. Simple linear regression indicates that monthly income and educational level are variables that predict healthy behaviors ($p = 0.000$). Treatment adherence is positively associated with healthy behaviors ($p = 0.000$).

The study showed healthy behaviors and adherence to treatment was within the unacceptable level. Health behaviors can predict improved adherence to treatment. The study sheds light on health education for all segments of society towards healthy behaviors in patients with type 2 diabetes. Further study is needed to explore strategies that maintain healthy behaviors among patients in order to improve their adherence to treatment.

Table of Contents

List of Tables

List of Figures

List of Appendices

List of Abbreviations

Abbreviation	Full Term
ATP	Adenosine triphosphate
BCE	Before Common Era
CVD	Cardiovascular disease
D.f	Degree of freedom
DM	Diabetes mellitus
HDL	High-density lipoprotein
IDF	International Diabetes Federation
M.S	Mean of score
MENA	Middle East and North Africa
No.	Number
NS	Non-significant
P.	Page
p.p.	Pages
PSS	Post Psychosocial Support
P-value	Probability value
QOL	Quality of Life

S	Significant
S.D	Standard Deviation
SPSS-XX	Statistical Package of Social Sciences 20
T2DM	Type 2 diabetes mellitus
WHO	World Health Organization
%	Percentage
E_i	Expected frequency
O_i	Observed frequency
σ_{ii}	Variance (not standard deviation) of item i
σ_{ij}	Estimated covariance between items i and j
$\sum$	Sum
BMI	Body Mass Index
DKA	Diabetic Ketoacidosis
HHNS	Hyperglycemic hyperosmolar non ketotic syndrome
IGT	Impaird glucose tolerance
SSA	Sub-saharan African

Chapter One

Introduction

Chapter One

Introduction

1.1. Background

Chronic disorders account for a staggering 50% of primary care clinic visits, indicating a relentless increase in the prevalence of long-term conditions. These conditions pose a significant financial burden, with reports suggesting that individuals with chronic diseases consume a substantial 70% of the entire healthcare budget (Prajapati *et al*., 2018).

In light of this, health behavior and treatment adherence have emerged as pivotal indicators for evaluating the effectiveness of disease management plans, particularly because patients with long-term disorders require extended periods of therapy. Given that poor behavior can lead to severe disease-related consequences, enhancing patients' health behaviors becomes paramount in the management of chronic illnesses (Khayyat *et al*., 2019).

Adherence to prescribed regimens plays a critical role in the successful implementation of both pharmaceutical and non-pharmacological approaches, as well as in the efficient management of chronic conditions. Regrettably, patients with chronic diseases often grapple with medication non-adherence (Majeed *et al*., 2021). Studies have shown that individuals with acute illnesses tend to adhere more diligently to their treatment regimens compared to those dealing with chronic conditions. Medication adherence in industrialized nations hovers around 50%, and it is anticipated to be even lower in underdeveloped regions (Kvarnström *et al*., 2021).

Managing diabetes mellitus is particularly challenging because it is influenced by the patient's social environment. Patients face the daunting task of addressing this chronic disease in the context of their lives. Consequently, they must recognize the intricate interplay between socioeconomic, cultural, health, and

nutritional factors, both within themselves and among their peers (Renzi *et al*., 2019).

Diabetes poses a formidable health concern due to its potential complications such as impaired vision, renal failure, and other serious issues. Dealing effectively with this disease requires acceptance and ongoing engagement because of the associated risks, complications, and profound impacts on the lives of those affected, their families, and the individuals themselves. Additionally, patients with diabetes often endure significant psychological distress (Singh *et al*., 2021).

The development of diabetes occurs gradually, primarily stemming from chronically low levels of insulin due to insulin resistance and/or ß-cell dysfunction (Rashidy & Karkehabadi, 2021). Type 2 diabetes mellitus (T2DM) is the most prevalent form worldwide, characterized by the body's inefficient utilization of insulin and a gradual loss of pancreatic beta cells (Pivari *et al*., 2019).

Although the symptoms of both types of diabetes can overlap, T2DM often presents with milder or even absent symptoms, making it a silent ailment for extended periods before complications manifest. Traditionally seen in adults, T2DM is now increasingly affecting younger individuals, according to the latest data from the World Health Organization (WHO) (Kopitar *et al*., 2020).

According to the International Diabetes Federation (IDF), the global number of adults living with diabetes currently stands at a staggering 463 million, and this figure is projected to skyrocket to 700 million by the year 2045. This chronic condition has emerged as one of the top 10 leading causes of death worldwide, claiming approximately 4.2 million lives, and it has attained pandemic proportions across the globe. Beyond the grim statistics, diabetes exacts a profound toll on both physical and mental well-being, significantly increasing mortality rates (IDF, 2020).

Moreover, the challenges of elevated blood sugar levels, dietary restrictions, and exercise regimens place an ongoing burden on individuals with diabetes,

necessitating regular insulin injections. Regrettably, musculoskeletal and vascular complications further compound the hardships faced by these patients, severely compromising their quality of life (QoL) (Sözen *et al*., 2018). To stave off the development of life-threatening complications associated with diabetes, it becomes imperative to empower patients to diligently adhere to therapeutic protocols, make meaningful lifestyle adjustments, and heed medical counsel (Babenko *et al*., 2019).

Research underscores that effective management of chronic illnesses extends beyond merely tracking the interaction between the disease and its treatment. It hinges on comprehending how a patient's personality influences their coping mechanisms in the context of their ailment and its treatment, all while being shaped by intricate social and relational dynamics. A steadfast commitment to embracing treatment becomes essential for individuals to effectively navigate the challenges posed by their illness and lead fulfilling lives (Leventhal *et al*., 2020).

The concept of adherence encompasses a wide array of health-related behaviors. Improved adherence to medical guidance leads to enhanced disease management and a reduction in diabetes-related complications. It is worth noting that health behaviors and medication adherence are intertwined; individuals who exhibit healthier behaviors are more likely to adhere to their treatment, and vice versa (Zioga *et al*., 2016).

Enhanced medical adherence not only contributes to better disease control but also translates into fewer instances of diabetes-related complications, such as vascular retinopathy and kidney disease. As underscored by Alfian *et al*. (2016), managing diabetes is an arduous, lifelong journey that demands unwavering commitment. Consequently, the importance of medical adherence cannot be overstated, as studies reveal a prevalence of poor adherence ranging from 36% to 93% across various treatment components, including medication, dietary restrictions, exercise regimens, and regular check-ups (Jannoo *et al*., 2017). The

overarching goal of diabetes treatment is to mitigate the complications associated with the condition, alleviate the symptoms of hyperglycemia, and ultimately enhance the overall quality of life for affected individuals (Babenko *et al*., 2019).

1.2.Importance of the Study

Approximately 366 million individuals across the globe are grappling with diabetes, and an alarming half of them remain unaware of their condition. Notably, six out of the top ten nations with the highest diabetes prevalence—Kuwait, Lebanon, Qatar, Saudi Arabia, Bahrain, Iraq, and the United Arab Emirates—are situated in the Middle East. Within the 20 Arab nations where data is available, nearly 20.5 million people currently have diabetes, while another 13.7 million are grappling with pre-diabetes or impaired glucose tolerance. A striking 73.4% of individuals with diabetes in Arab countries fall below the age of 60, which places them in their most productive years. This stands in contrast to developed nations, where the majority of those afflicted by diabetes are past retirement age, thus exacerbating the disability burden associated with diabetes (IDF, 2015).

Back in 1997, the World Health Organization (WHO) estimated the global diabetic population at over 135 million. Shockingly, by 2025, this number is projected to have ballooned by a staggering 120%. Even more concerning is that, according to estimates, half of Americans living with diabetes remain undiagnosed (Ali *et al*., 2019).

Over the past three decades, the prevalence of diabetes has exhibited a relentless upward trajectory, with low- and middle-income countries witnessing the most rapid surge. Troublingly, there are instances of Type 2 diabetes manifesting in children at earlier ages, potentially attributed to the evolving, modernized lifestyles we lead (Buss et al., 2020; Tran *et al*., 2020).

In 2017, the International Diabetes Federation (IDF) data indicated that a staggering 8.8% of adults globally were anticipated to be afflicted by diabetes. The

Middle East and North Africa (MENA) region under the IDF's purview boasted the second-highest prevalence rate at 9.2%. Alarming predictions suggest that diabetes prevalence in the MENA region is poised to surge by a daunting 110% between 2017 and 2045, ultimately affecting a global population of 629 million individuals (Saeedi *et al*., 2019; Simeni Njonnou *et al*., 2020).

Diabetes is a serious illness. According to Sun et al. (2022), the death rate from diabetes among adult patients (20-79 years) was 10.7% in 2017. In the MENA Region, diabetes is estimated to be the second leading cause of death for patients under the age of 60, accounting for 373 557 fatalities across 21 countries and territories, including Iraq. This places the region in the highest second level all IDF regions (Abusaib *et al*., 2020).

Despite the high incidence of diabetes in the Middle East and North Africa (MENA) region, little information is available on the disease's course and complications, and just 2.9% of the world's total diabetes spending is allocated to the area (Yuen *et al*., 2019).

Diabetes affects 1.4 million Iraqis. IDF age-adjusted prevalence estimates for T2DM in Iraq range from 8.5% to 13.9%.3 In the city of Diyala, in middle Iraq, a local study with more than 5400 participants discovered a 19.7% age-adjusted prevalence of diabetes in persons aged 19 to 94 years (WHO, 2018).

Iraq has one of the highest prevalence rates of Type 2 diabetes in the world, at 13.9%, and one of the highest rates of chronic complications. No research have examined whether low adherence is a contributing factor for such poor control in this national population, despite the fact that several studies have identified poor glycemic control as a significant factor behind high complication rates (Abusaib *et al*., 2020).

According to Aloudah et al. (2018), taking diabetes medications as prescribed is crucial to maintaining good diabetes control and avoiding death and

morbidity. According to reports, adherence to oral hypoglycemic differs between various populations by 36% and 93% (Polonsky & Henry, 2016).

Medication adherence is a complicated process that depends on a wide range of variables. More than 200 variables linked to medication adherence behavior were found in a meta-analysis of 569 research (Lambrinou *et al*., 2019).

Numerous studies have demonstrated that a variety of factors influence patients' adherence to treatment plans. Depression, a lack of social support system, weight loss and glycemic control, low levels of literacy, forgetfulness, the high cost of medication, limited access to care, the complexity of regimens, poor patient-provider communication, and a lack of trust in the healthcare provider are a few of these (Jin *et al*., 2016; Burnier, 2017; Washington & Langdon, 2021). Studies have also identified additional elements that should be looked into, such as worry about adverse effects, vision impairment, and diabetic foot issues (de Souza Moreira *et al*., 2017).

Despite the fact that diabetes is regarded as a chronic and expensive disease, its course can be managed and developed by the patient's adherence to medical recommendations, instructions, and follow-up treatment, as well as adherence to healthy behavioral practices, in addition to modifying the lifestyle that the patient adopts in his life, as confirmed by medical and scientific evidence that clearly indicated there is a close relationship between an individual's adolescence and their adulthood. Therefore, the majority of illnesses that people experience are mostly brought on by their bad habits and activities (Reisi *et al*., 2021).

1.3. The Study Problem

The metabolic illness diabetes mellitus (DM), which is on the rise and poses a serious public health burden, needs prompt treatment on a global scale. There is, however, a dearth of information regarding anti-diabetic medication adherence among type-2 (T2)DM patients. According to outpatient research, more than 50%

of patients do not follow the proper administration and dose guidelines for their medications. According to reports, individuals with chronic conditions who adopt healthy behaviors may see an improvement in their adherence to treatment, and the opposite is also true (Mishra *et al*., 2021). As a result, among type 2 diabetic patients, health behaviors are crucial for treatment compliance and disease management.

To the best of our knowledge, there haven't been many studies on diabetes patients in Iraq's health behaviors and medication adherence. So it made sense to look at these two characteristics. In the current study, diabetes type 2 patients' health behaviors are evaluated together with their relationship to treatment compliance. It adds to the expanding corpus of research on treatment compliance and gives medical practitioners crucial information because understanding this phenomena is the first step in developing effective therapies.

1.4.Objectives of the Study

The study aimed to the following:

1. To assess health behaviors and treatment adherence among patients with type II diabetes mellitus.
2. To Investigate the differences in treatment adherence with regards socio-demographic characteristics.
3. To Identify if the patients age, gender, monthly income, marital status, education level, occupation, duration of disease and associated comorbidities can predict their health behaviors.
4. To Find out the association between health behaviors and treatment adherence among patients with type II diabetes mellitus.

1.5. Hypothesis

The study hypothesized the following:

H_0: Health behaviour among type 2 DM will not relation to treatment adherence among patients with type II diabetes mellitus.

H_1: Health behaviour among type 2 DM will relation to treatment adherence among patients with type II diabetes mellitus.

1.6. Definitions of Terms

1.6.1. Health Behaviour

Theoretical Definition:

Health behaviors encompass the deliberate actions individuals take, which significantly impact their overall well-being (Conner & Norman, 2017).

Operational Definition of Health Behaviour:

Health-related behaviors refer to a spectrum of actions directly influencing one's health outcomes.

1.6.2. Treatment Adherence

Theoretical Definition:

Treatment adherence denotes the extent to which an individual's actions align with the prescribed recommendations of a healthcare professional, encompassing aspects like medication adherence, dietary choices, and lifestyle modifications (WHO, 2014).

Operational Definition of Treatment Adherence :

Treatment adherence measures the degree to which a patient adheres to their healthcare provider's instructions, encompassing medication adherence, regular check-ups, dietary habits, nutrition, and physical activity.

1.6.3. Type 2 Diabetes Mellitus

Theoretical Definition:

Type 2 Diabetes Mellitus is a chronic ailment characterized by elevated blood sugar levels, which, if left unmanaged, can lead to complications affecting the immune, neurological, and circulatory systems (IDF, 2020).

Operational Definition of Type 2 Diabetes Mellitus:

Type 2 Diabetes Mellitus refers to a chronic metabolic condition wherein the body struggles to regulate and utilize glucose effectively as its primary energy source.

1.6.4. Patients

Theoretical Definition:

A patient is an individual who is under the care and supervision of healthcare professionals, receiving medical attention or therapeutic interventions (WHO, 2017).

Operational Definition of Patients:

A patient in the context of this study is an individual diagnosed with type 2 diabetes who has sought medical care at a diabetic center following their diagnosis.

Chapter Two

Literature Review

Chapter Two

Literature Review

2.1.Type II Diabetes Mellitus (T2 DM): An Overview

One of the first diseases to be named was diabetes, which was mentioned in an Egyptian document from around 1500 BCE that also mentioned excessive urine output. Type 1 diabetes is thought to have been present in the earliest instances reported (Alam *et al*., 2017). Around the same time, Indian doctors diagnosed the condition and labeled it as madhumeha, or honey urine, noticing that the urine would attract ants (Sugave Ramling *et al*., 2019).

In an Egyptian manuscript from more than 3000 years ago, diabetes mellitus was first described (Baum *et al*., 2020). The distinction between T1D and T2D was determined, but, not until 1936. T2D accounts for about 90% of diabetes occurrences and is by far the most prevalent type of diabetes (Skyler *et al*., 2017).

T2D is a chronic, multifactorial, metabolic disorder that affects numerous organs and is on the rise in the world today. It is characterized by peripheral tissue insulin resistance, increased pancreatic alpha-cell function, and pancreatic beta-cell malfunction (Reed et al., 2021).

As a result of these changes, peripheral tissues, such as skeletal muscle, experience impaired amino acid uptake and ATP production, impaired nutrient uptake, dyslipidemia (hypertriglyceridemia and low high-density lipoprotein [HDL]-cholesterol), hyperglycemia due to impaired peripheral glucose uptake, increased glucagon production, which amplifies hyperglycemia and hyperlipidemia, and impaired amino acid uptake and ATP production (Chia *et al*., 2018).

Given that 90% of T2D patients in western nations are fat or overweight, it is believed that diets containing excessive food consumption are a major

contributing factor in the disease. A study in China indicated that, in contrast to what was reported in western nations, 50.3% of T2D patients were not overweight, and other (Stanhope *et al*., 2018).

A significant portion of T2D patients in Asian nations have a BMI of less than 25. It is now obvious that genetic factors contribute to susceptibility, even if no significant risk genes have been discovered. T2D is viewed as a heterogeneous disease because each patient's prognosis, treatment needs, and degree of insulin insufficiency differ (Prasad & Groop, 2019).

Diabetes continues to be a major contributor to cardiovascular disease, end-stage renal disease, lower limb amputation, and blindness despite the availability of therapies. According to a UK study, patients with diabetes had 48.9% of amputations between 2007 and 2010, and they were also 23.3 times more likely to have an amputation (Bermejo *et al*., 2021).

Additionally, people with diabetes frequently experience impotence, neuropathology, decreased wound healing, and infection susceptibility. T2D has also been linked to an increased risk of Parkinson's and Alzheimer's illnesses. Seventy-five percent of all linked deaths in diabetes patients are attributable to cardiovascular disease (CVD), and people with T2D often have a higher risk of having a shorter lifespan (Epstein, 2017).

Numerous therapies exist to enhance insulin secretion and/or lessen peripheral tissue insulin resistance, which lowers hyperglycemia. Maintaining glycaemic control in patients is difficult, though, as administering the currently available medications might cause either an excessive or insufficient amount of an anti-hyperglycemic impact, respectively (Boursier *et al*., 2021).

Longitudinal investigations in humans have shown that beta-cell function often declines over time, regardless of the treatment regimen. Theoretically, chronic

hyperglycemia and dyslipidaemia cause beta-cell function to gradually deteriorate after diagnosis (Taylor et al., 2019).

2.1.1. Epidemiology of T2DM

In 2013, there were reportedly 382 million T2D sufferers worldwide, a figure that has more than doubled in the previous two decades. T2D is becoming more common and more commonplace. Over 590 million T2D cases are anticipated to be detected by 2035. Even if the prevalence and incidence of T2D differ between nations, it is still regarded as an illness that affects everyone on the planet. T2D was once thought to be a condition brought on by "western lifestyles" (high-calorie diets and sedentary habits) (Knudsen et al., 2022).

It's interesting to note that developing nations are expected to have a nearly 4-fold higher rate of T2D prevalence than developed ones. This is believed to be a result of emerging nations adopting "western lifestyles," which have led to an increase in obesity and the proportion of overweight persons in their populations (Afroz et al., 2019).

Generally speaking, people who are 40 to 60 years old in industrialized countries and 60 or older in poor countries have the highest chance of getting T2D. Despite the fact that T2D is thought to be an adult disease and that prevalence rises with age, it is becoming frequent for children to be afflicted. However, it is possible that the number of people identified with T1D in adulthood is underestimated. It has been suggested that 5-15% of adult patients receive incorrect diagnoses of T2D when they may actually have T1D; this is a subject of debate in the literature at the moment (Islam et al., 2021)

T1D was once assumed to be the cause of diabetes in young individuals. T2D patients were uncommon at paediatric centers up until the early 1990s. With paediatric T2D accounting for up to 45% of newly diagnosed paediatric diabetes cases in the USA, this has significantly changed since the late 1990s. The youth

T2D is not simply an American phenomenon. A startling 80% of all newly diagnosed cases of diabetes in children and adolescents in Japan were T2D, and other nations have also documented an increase in young people developing T2D (Lin et al., 2021).

However, numerous studies from Europe have found that young people with T2D are substantially less common, making up only 1% to 2% of all instances of diabetes mellitus (Flannick et al., 2019). T2D sufferers are most prevalent in China (98 million), followed by India (65 million), with a close second. In 2013, there were around 24 million T2D sufferers in the USA. According to a 2013 survey, Tokelau has the highest prevalence of T2D (37.5%) in the general population (Pati & Schellevis, 2017; Qi et al., 2019).

T2D prevalence rates among the national populations of the Federated States of Micronesia, the Marshall Islands, and Kiribati are 35, 34.9, and 28.8%, respectively. In 2013, the prevalence of T2D in the national population was less than 26% in all other nations. In the years 2009, 2011, 2013, 2015, and 2017, the estimated numbers of persons with diabetes were 285, 366, 382, 415, and 425 million (Reed et al., 2021).

Less than 1% of the population in the USA had a diabetes diagnosis in 1958, and the disease was thought to be unusual at the time. T2D incidence and prevalence, however, rose in industrialized nations over the second half of the 20th century, turning into an epidemic by the end of the century and continuing into the 21st. T2D incidence and prevalence have risen in recent decades in developing nations as well, making it a comparable health burden in these nations. In 1980, only 1% of Chinese people developed diabetes; by 2008, that number had nearly doubled to 10% (Zheng et al., 2018).

Contrary to the perception that patients in poor nations are often over 60, it was revealed in 2014 that 46% of newly diagnosed T2D patients in India were under

the age of 40. Incidence and prevalence of T2D have also risen significantly in the twenty-first century. According to estimates, there will be more than 700 million T2D sufferers globally by 2045 (Onge et al., 2015).

2.1.2. Etiology of T2DM

There are numerous known risk factors for T2D. Obesity is the greatest risk factor because it increases T2D risk by 90-fold and the majority of patients have this condition. The risk of T2D climbs exponentially with higher BMI and is positively associated with rising BMI. According to estimates, between 50% and 40% of T2D patients in Western nations have a BMI of 25 to 30, and between 30 and 50% have a BMI of >30. However, almost 50% of patients in several Asian nations do not have excess weight. Interestingly, there have even been reports of underweight T2D patients (Suceveanu et al., 2018).

The risk of T2D is also more than doubled when there is increased fat deposition in the ectopic areas of the body, notably visceral fat (van Eyk et al., 2019). T1D is recognized to be significantly influenced by genetics, while T2D is also affected by genetics. These findings suggest that genetics play a significant role in T2D susceptibility. The concordance rate between monozygotic twins with T2D is higher (around 70%) compared with T1D (between 30 and 50%), and the lifetime risk of individuals for developing T2D is 40% with one affected parent and almost 70% if both parents are affected (Mishra et al., 2017).

Dizygotic twin concordance rates for T2D (between 20 and 30%) are also greater than those for T1D (about 10%). The highest odds ratio for a T2D risk locus, however, is 1.57, which suggests that there are additional yet untested variations that contribute to T2D susceptibility. Relatives of type 2 diabetic patients may have a higher chance of developing the disease due to their comparable dietary habits and lifestyles as well as genetics (Reed et al., 2021).

In one study, higher rates of T2D were observed in twin populations compared to singleton populations, and both populations had similar average BMI scores (26.1-26.3) and comparable standard deviation values (3.9-4.7), demonstrating the significance of genetics in T2D susceptibility independent of diet. Even in people with low-risk dietary and physical activity profiles, a cohort study indicated that drinking alcohol and smoking increased the incidence of T2D (Jayaweera et al., 2018; Lee et al., 2020).

Interestingly, long-term research has shown that psychological stress-related circumstances such demanding work environments or mental health issues like depression raise the likelihood of T2D (Reed et al., 2021).

T2D is more common in men than in women around the world, and in 2013, 14 million more men than women received a T2D diagnosis. Adult men are shown to have a higher risk of T2D than women, which is assumed to be caused at least in part by altered adiposity storage patterns in men (Dávila-Cervantes et al., 2019).

Men with T2D are more likely than women to develop CVD, according to studies, but women with T2D who do develop CVD are more likely to have a worse prognosis, which is thought to be at least partially because men are more likely to meet medical goals for T2D (like desirable blood pressure and plasma glucose control) (Rørholm Pedersen et al., 2016).

As a result of the usage of pesticides, medications, and food additives in food processing and packaging during the past few decades, environmental changes may also have an impact on the genesis of T2D. However, there is little evidence connecting the aetiology of T2D to contemporary changes in food processing and packaging (Fénichel & Chevalier, 2017).

But it is known that hepatitis C encourages insulin resistance in the liver, which is likely to raise the risk of T2D. If this is the case, it implies that insulin resistance in the liver alone can cause T2D manifestation, which shows that the liver

may be considerably more significant in T2D aetiology/pathogenesis than is currently believed (Gastaldi et al., 2017).

2.1.3. Pathophysiology of T2DM

In the presence of insulin resistance, type 2 diabetes results from insufficient insulin synthesis by beta cells. Specifically, in the muscles, liver, and adipose tissue, insulin resistance—the inability of cells to respond to normal levels of insulin—occurs. Insulin often inhibits the release of glucose from the liver. However, when there is insulin resistance, the liver releases glucose into the blood in an unsuitable manner. Each person has a different ratio of insulin resistance to beta cell malfunction; some have primarily high levels of insulin resistance and just a little deficiency in insulin secretion, while others have slightly lower levels of insulin resistance and mostly low levels of insulin secretion (Okur et al., 2017).

Increased breakdown of lipids within fat cells, resistance to and lack of incretin, high blood levels of glucagon, increased salt and water retention by the kidneys, and improper regulation of metabolism by the central nervous system are additional potentially significant mechanisms linked to type 2 diabetes and insulin resistance. However, not everyone who has insulin resistance goes on to develop diabetes since pancreatic beta cells need to secrete insulin improperly in order for this to happen (Oyewande et al., 2020).

2.1.4. Signs and Symptoms of T2 DM

According to Vujosevic et al. (2019), frequent urination (polyuria), increased thirst (polydipsia), increased appetite (polyphagia), and weight loss are the traditional signs and symptoms of diabetes. Other symptoms that are frequently present at diagnosis include fatigue, peripheral neuropathy, itching, impaired vision, and recurrent vaginal infections. Added signs could include a lack of flavor (Soliman et al., 2020).

However, many patients are diagnosed on routine testing even though they show no symptoms for the first few years. A tiny percentage of persons with type 2 diabetes may have a hyperosmolar hyperglycemic state, which is characterized by extremely high blood sugar levels, lowered consciousness, and low blood pressure (Forte et al., 2020).

2.1.5. Complications of T2 DM

Type 2 diabetes is often a chronic condition that reduces life expectancy by ten years. This is mainly because it is linked to a number of problems, such as a two to four times increased risk of cardiovascular disease, including ischemic heart disease and stroke; a 20-fold rise in lower limb amputations; and higher rates of hospitalization (Babaliche et al., 2019).

Type 2 diabetes is the leading cause of nontraumatic blindness and renal failure in the developed world, as well as increasingly elsewhere. Additionally, it has been linked to a higher risk of cognitive impairment and dementia due to conditions including Alzheimer's disease and vascular dementia (Koc & Sumbul, 2019).

Other issues include frequent infections, sexual dysfunction, and skin darkening (acanthosis nigricans). Additionally, type 2 diabetes and slight hearing loss are linked (Sheir et al., 2020).

There are two main groups for the most frequent complications: (A) Acute side effects like hypoglycemia, diabetic ketoacidosis (DKA), and hyperglycemic hyperosmolar nonketotic syndrome (HHNS). (B) Chronic complications, either microvascular (stroke, coronary artery disease, and peripheral arterial disease) or macrovascular (diabetic retinopathy, nephropathy, and neuropathy) (Faselis et al., 2020).

2.1.6. Prevention of T2 II DM

A healthy diet and regular exercise can postpone or prevent the onset of type 2 diabetes. Intensive lifestyle changes could cut the risk in half or more. Regardless of a person's starting weight or subsequent weight loss, exercise is beneficial. High levels of physical activity roughly 28% lower the risk of diabetes (Lundy et al., 2020).

While there is some support for a diet heavy in green leafy vegetables and some support for decreasing the use of sugary drinks, there is little support for the benefits of dietary modifications alone. There is no evidence that 100% fruit juice is associated with diabetes, but a larger intake of sugar-sweetened fruit juice (Uusitupa et al., 2019).

Diet and exercise, either alone or in combination with metformin or acarbose, may lessen the risk of developing diabetes in those with impaired glucose tolerance. Metformin is less effective than lifestyle changes (Uusitupa et al., 2019).

While medication does not lower risk after cessation, lifestyle adjustments reduced it by 28%. Although low vitamin D levels are linked to an increased risk of diabetes, the risk is not reduced by raising the levels by using vitamin D3 supplements (Sankar et al., 2020).

2.1.7. Management of T2 II DM

Goals of DM treatment include reducing complications by glycemia management, blood pressure control, macrovascular (including coronary, cerebrovascular, and peripheral vascular) control, lipid control, hypertension control, and quitting smoking. Controlling glycaemia can lessen issues related to the metabolism and nervous system (Jayawardena et al., 2018).

Metformin is the best first-line drug, unless it is contraindicated, and is followed by the use of one or two additional oral or injectable agents, with the aim of minimizing side effects as much as possible. Individualized glycemic targets,

glucose-lowering therapies, diet, exercise, and health education as the foundation of the treatment program (Anwer et al., 2018).

At the end, all treatment decisions should be tied to the state of the patient, with a focus on the patient's preferences, needs, and values, whether insulin therapy is used alone or in combination with other medications to maintain blood glucose control. comprehensive cardiovascular risk reduction is the primary emphasis (Feizollahzadeh et al., 2017).

Low blood sugar (hypoglycemia) and high blood sugar (hyperglycemia) during self-monitoring of blood glucose are of concern, especially for patients who take insulin. In type 2 DM, blood glucose levels are typically more stable than in type 1 DM, hence doctors typically advise simply testing blood glucose levels once or twice each day. Patients who become insulin-dependent require more thorough monitoring (Afandi et al., 2019).

So, it may conclude that type II diabetes, which causes excessive blood sugar, is one of the most prevalent diseases in many societies. The patient must maintain treatment throughout his entire life because it is a chronic condition that cannot be cured. As a result, he must maintain his diet and take his medications as prescribed in order to accept the illness and live with the disease.

2.2. Health Behaviour

The individual's physical, mental, and intellectual well-being, as well as other fundamental components that ensure his survival in general, and his physical well-being in particular, determine his continuity and survival. The individual has a major role in maintaining his health and protecting himself from diseases and health problems that hinder his life and prevent him from being able to practice it normally. This is done through the healthy behavior that an individual follows through healthy and sound practices. The individual's possession of health guarantees a person's

survival and continuity in a sound manner, enabling him to perform his work and practice his life normally (Morgan et al., 2020).

Behavior is the result of an organism's motor, psychological, and glandular reactions, i.e., actions coming from its body's muscles or glands. As a result, human behavior is made up of a variety of actions that a person takes in order to adapt to his or her environment (Warren, 2018).

Ecological psychology defined it as the response that a person makes to his survival and to confront the circumstances surrounding him in the environment (Lockton, 2012), while traditional psychology defined it as the result of unique human personality traits such as: thinking, intelligence, feelings, inclinations (Schraube & Osterkamp, 2013). Behavior can be defined as the culmination of responses or reactions to external or internal stimuli that can be seen.

With the exception of impairments that may affect the body but do not generally impair the organs, health is an indicator of the life and functioning of all the components of the human body, both physical and psychological, over a sufficient period of time in accordance with the pattern or natural growth determined by medicine and science (Drewelies et al., 2017).

Health is now seen to be the confluence of three factors: organic, biological, psychological, behavioral, and social. It is no longer limited to the study of the bio-organic component. A thorough explanation of behavior aids in understanding how it relates to one's health and well-being. Behavior is therefore described as "everything that comes from a person such as thought, attitudes, words, emotions, and actions." Given this description, it is clear how conduct connects to certain aspects of health and how to change behavior by altering certain beliefs, attitudes, or deeds. Behavior is made up of thoughts, attitudes, words, emotions, and deeds (Conner & Norman, 2017).

Sami et al. (2018) state that a number of variables can affect healthy behavior, including as:

1. Age, case history, acquaintances, etc. are examples of personal and environmental factors.
2. Factors that are relevant to the group and society, such as occupation, education, and so forth.
3. The sociocultural factors of offers, usability, and accessibility to centers
4. Health services in the sense of public communication systems, health education and awareness campaigns, systems of religious and ideological values, and legal frameworks, etc.

2.2.1. Health Behavior Patterns

1.Exercise and physical activity:

One of the sorts of healthy behaviors is exercising. Any movement that uses energy and is powered by the skeletal muscles is considered to be physical activity. It can be separated into sports activities, activities connected to the person's job, housework, or any other daily activities that are done (Van Cappellen et al., 2018).

2.Food or diet behavior:

It is one of the components of a healthy lifestyle. It is a personal practice that develops as a result of experiencing both happy and negative outcomes. The results of studies have demonstrated that dietary systems interact with the effects of genetic variables in the onset of heart disease, blood pressure, and diabetes, and that an unhealthy eating pattern is a risk factor for many diseases in individuals (Bédard et al., 2020).

2.2.2.Health Behavior Dimensions

Park et al. (2018) highlighted the elements of health behavior and listed the following as examples:

1. **Preventive Procedures:** Include getting vaccinated against a certain disease, for example, or visiting a doctor frequently to get regular checkups. These actions will reduce a person's risk of contracting a disease.
2. **Health-Maintaining Practices:** Are those that will help an individual maintain their health, such as having a desire to engage in healthy eating or engaging in other advised healthy habits.
3. **Dimension of Health Promotion:** Consists of all methods used to promote and enhance health, particularly through regular exercise and physical activity.

2.2.3.Health Behaviour of Type II DM

Maintaining ideal blood glucose levels and lowering the chance of secondary problems are necessary for managing diabetes in order to increase longevity and quality of life. Diabetes self-management (DSM) encompasses almost every part of a person's life and takes a lot of time. In order to succeed, people must incorporate DSM into their lifestyle by changing ingrained routines and habits to incorporate advised diabetes self-care activities (Nguyen et al., 2022).

Diabetes is mostly caused by lifestyle and behavioral variables, hence altering one's lifestyle is essential for effective management. However, both patients and healthcare professionals find this to be the most difficult component of treatment frequently (Van Smoorenburg et al., 2019).

Numerous studies have revealed that persons with impaired glucose tolerance (IGT) can lower their risk of acquiring diabetes by altering their eating and/or activity habits. For instance, a lifestyle intervention that combined nutrition and exercise reduced the risk of diabetes by 50%, according to Stevens et al. (2015). Similarly, Zhang et al. (2017) observed a 25% risk reduction from either diet, exercise, or the combination of the two in their systematic review.

Due to circumstances relating to patients, institutions, and healthcare providers, self-care practices and adherence to diabetes patients' healthy behaviors may differ from one healthcare facility to another (Degefa et al., 2020). Alhaiti et al. (2020) claim that good self-management aids in preserving good glycemic control. This means that patients must follow the numerous self-care practices that are advised to them by their healthcare providers.

Consequently, we can define healthy behavior as everything an individual does to maintain and improve his or her state of health through the practice of healthy habits. The healthy behavior of diabetic patients in the study is based on adherence to a balanced diet, performing sports exercises, and engaging in activities that have a positive impact on the patient's state of health.

2.3. Treatment Adherence

Diabetes treatment management is hampered by poor adherence. Despite advancements in the treatment of diabetes mellitus over the years, the disease still has a significant negative impact on those who have it, their families, and the health care system as a whole (Mukona et al., 2017).

Treatment adherence is a complicated process that depends on numerous different variables. More than 200 variables connected to treatment adherence behavior were found in a meta-analysis of 569 research. Therefore, it is absolutely necessary to use a thorough analytical method to comprehend the specific inhibitors and facilitators of adherence to therapy (Aloudah et al., 2018).

The rates of morbidity and mortality seen among patients with Type 2 diabetes may be attributed to low medication adherence. Low adherence is a widespread issue that affects more than just one person or patient. To maximize the advantages of treatment adherence, a comprehensive, multifaceted approach is necessary. Physician, societal, and organizational factors all influence this behavior (Masaba & Mmusi-Phetoe, 2020).

People with type 2 DM are more prone to a variety of short- and long-term problems, which frequently result in early death. Patients with type 2 diabetes are vulnerable to higher morbidity and mortality due to the condition's prevalence, sneaky onset, and tardy diagnosis, especially in resource-poor developing nations (Misra & Misra, 2020).

By following their treatment plans, individuals can improve their ability to manage their conditions. Many patients have trouble adhering to treatment suggestions, particularly those with chronic illnesses. For chronic conditions, the average compliance with long-term therapy is only 50%. Poor adherence prevents patients from benefiting fully from their pharmacological therapy (Kubica et al., 2017).

Inadequate care can increase the need for medical services (acute care and hospital stays), lower the quality of life for the patient, and raise the price of medical and medication services. According to World Health Organization reports, improving the efficacy of adherence initiatives may have a much greater influence on population health than any advancements in particular medical treatments (Wilhelmsen & Eriksson, 2019).

Treatment for type 2 diabetes focuses on restoring normal glycemia and avoiding complications. Changes in lifestyle, the use of oral hypoglycemic medications and/or insulin injections, and self-care can all help (McKenzie et al., 2021).

Strict metabolic control and the capacity for self-care can enhance the effectiveness of diabetes therapy and significantly lower the risk of complications. Patients who actively participate in their care are better able to actively maintain their health. The only way for patients to achieve normal blood glucose levels is if they follow the treatment guidelines (Association, A.D, 2021).

The degree of patient compliance with medical advice is crucial to the success of type 2 diabetes treatment. Better treatment compliance promotes better diabetes management and helps to prevent both short- and long-term consequences (retinopathy, nephropathy, neuropathy, angiopathy, diabetic foot syndrome), as well as early problems (hypo- and hyperglycemia) (Patel et al., 2018).

According to research data, only 50% of patients receiving chronic treatment follow the recommended protocol throughout the first year of care (Bosworth et al., 2018). Only 65.1% of diabetics in Poland follow the recommended course of treatment, and less than half fully follow the American Diabetes Association's recommendations for blood glucose self-monitoring (Rokicka et al., 2018).

Diet, exercise, lifestyle, substance use, medication, follow-up visits, and self-monitoring can all contribute to non-adherence to diabetes therapy. A variety of non-adherence behaviors are described in the literature. It may be purposeful (when the patient consciously chooses to stop receiving therapy), unintentional (for example, due to forgetfulness), or both (Mugo, 2019; Koech, 2020).

Serious consequences, such as disease relapse and progression, may occur if T2DM patients do not take their medications as prescribed (Gholamaliei et al., 2016). It is debatable whether non-adherence to anti-diabetic drugs will continue to be a problem in Sub-Saharan African (SSA) nations like Uganda, Burundi, Tanzania, and Kenya if no preventive measures are taken to lessen its causes (Shayo & Shayo, 2019). The prevalence of diabetes has increased in Rwanda and now accounts for more than 2% of all fatalities (Birabwa et al., 2019).

Additionally, more than 50% of T2DM patients have poor glycemic control, which makes life more difficult in East African nations including Ethiopia, Tanzania, Uganda, and Kenya. Moreover, factors contributing to non-adherence include socio-cultural issues, substance use, health literacy, belief, the availability

and affordability of insulin, as well as the high cost of anti-diabetic medications, the lengthy duration of medication use, the side effects of anti-diabetic medications such as fatigue, nausea, vomiting, psychological problems, and itching, and non-persistence (Aminde et al., 2019; Murwanashyaka et al., 2022).

The inferior treatment outcomes, low demographic features (such as young age, lower education, and poverty), the progression of disease symptoms, and complications were all factors of non-adherence that had been discovered in earlier studies. Strict adherence to prescriptions, dietary restrictions, and lifestyle changes can help patients achieve optimal glucose control while reducing long-term problems. Due to this, it becomes challenging to maintain the required level of glycemia (Huang et al., 2021).

While purposeful non-adherence may involve delaying or skipping doses, and in extreme situations, totally ceasing therapy, unintentional non-adherence often involves forgetting particular prescription doses (Świątoniowska-Lonc et al., 2021).

A patient's health frequently declines as a result of non-adherence to therapy, which also has considerable negative economic effects due to greater treatment expenses brought on by rehospitalizations, time away from work, ongoing care for increasingly serious problems, and finally death (Oh et al., 2016).

In light of this, the WHO believes that improvements in the efficacy of programs designed to encourage adherence may have a significantly higher effect on population health than do developments in therapy. Thus, a deeper comprehension of the mechanisms underlying non-adherence is necessary (Bosworth et al., 2017).

2.3.1. Adherence related Food, Diet and Exercise

Generally speaking, a diabetic food that restricts calories to encourage weight loss is advised. Other suggestions include promoting consumption of fruits,

vegetables, low-fat dairy products, reduced saturated fat, and a macronutrient intake that is customized for each person, distributing calories and carbohydrates throughout the day (Mikhael et al., 2018).

The world's dietary and eating habits have seen significant shift in recent decades. A global epidemic of diabesity, where obesity and type 2 diabetes mellitus (T2DM) occur in the same person, has emerged in conjunction with rising sedentary behavior. According to reports, there are 98 000 T2DM cases, and the number is increasing by roughly 7000 each year. Adults with T2DM must follow a self-care program that includes food restrictions, physical activity, medications, and glucose level self-monitoring. Patient For sustained glucose control and long-term health results, it's imperative to follow the diet recommendations for people with diabetes (Al-Salmi et al., 2022).

The cornerstones of diabetic care are a healthy diet and frequent exercise, with one review finding that more exercise led to better results. Regular exercise may reduce blood lipid levels, enhance blood sugar control, and reduce body fat (Laranjo et al., 2015).

People with type 2 diabetes should engage in at least 150 minutes per week of moderate to strenuous aerobic activity spaced out over at least three days of the week, with no more than two days in a row between sessions (Jayedi, et al., 2022).

2.3.2.Aherence related Medication

The prevalence of type-2 diabetes mellitus and associated complications is rising. Numerous studies have shown that the degree of glycemic control attained through medication adherence is the most significant predictor of a decrease in morbidity and mortality related to diabetic complications (Trout et al., 2019).

There is ample proof that the degree of glycemic control attained is the most significant predictor of the decline in morbidity and death caused by diabetic complications. This has pushed patients to receive aggressive care in an effort to get

their blood glucose levels as close to normal as feasible. In an effort to achieve better glycemic control, lower rates of acute/long-term problems, and increase patient survival, there has been a transition from monotherapy with OHAs to combination therapy with at least two agents, frequently from different classes, with or without insulin (Trout et al., 2019).

2.3.3.Adherence related Periodic Examination

Regular testing for type II diabetes saves hospital stays, lowers treatment expenses, and improves quality of life. Chronic and acute illness consequences can be postponed or averted with regular patient monitoring (Nejat et al., 2021).

The self-care of the individual is influenced by a number of variables, including the type of diabetes, the severity of the condition, whether any underlying diseases are present, and psychological, social, and economic aspects. On the other hand, these parameters may vary depending on the culture, which may result in fewer patients returning to the medical facility (Alvarado-Martel et al., 2019).

2.4.Factors Influence Treatment Adherence

Many reasons that hinder type 2 diabetes mellitus patients' adherence to therapy, according to Bermeo-Cabrera et al. (2017), include:

2.4.1.Factors related to Patients

The T2 DM patient re-adapts himself in accordance with this state, imposing social roles and the development of new relational patterns on him. The T2 DM exists as a transitional state that may be short-lived or prolonged and during which the patient's representations, activities, and desires are subjected to tension (Sorato et al., 2016).

This is due to the fact that the condition necessitates a process of adaptation towards this new reality before the start of treatment, which is influenced by the patient's beliefs, emotions, and antecedents in addition to the disease's and treatment's nature (Polonsky & Henry, 2016).

The patient's denial of the disease, its seriousness, and even the need for treatment that prevents it from getting worse is one of the issues brought up. As a result, refraining from therapeutic measures becomes an expression of the patient's desire to forget the disease at a time when treatment may be a factor that reminds him of it (Jenssen & Hartmann, 2019).

2.4.2.Factors related to Disease

Treatment acceptance becomes a difficult challenge for the patient, delaying his recovery and preventing the improvement of his health condition. Treatment adherence is also impacted by patients who have other accompanying diseases, which hinder a good commitment to treating the primary disease or treatments for comorbid diseases (Zhang et al., 2018).

In this context, the term prolonged treatment exposure refers to a state of chronic disease that extends beyond just protracted treatment to include multiple changes in the patient's resourcefulness that may be challenging for him. Non-compliance with treatment can occasionally become a predictable and complex behavior at the same time if they are isolated, how if these alterations are combined with the problems and complications of chronic disease, complications and side effects of medication, and socioeconomic factors (Martín-Timón et al., 2014).

2.4.3.Factors related to Medication

For a diabetic, taking treatment need not be thought of as being straightforward because it entails changing one's attitude and adapting one's beliefs to new information. As a result, a patient's response varies depending on the length of the treatment, as well as its complexity, effectiveness, and side effects. most chronic illnesses that demand prolonged therapy without improvement (Lee et al., 2017).

To maintain a high degree of adherence to that therapy over the long term, which tends to deteriorate during treatment, is more important than talking about therapeutic adherence within a certain time period (Heissam et al., 2015).

Rezaei et al. (2019) claim that a variety of treatment-related variables affect how well patients accept their care. These variables can be explained as follows:

1. Treatment related to knowledge
2. Treatment related to complexity and regimen
3. Treatment related to recovery
4. Treatment related to side effect.

2.4.4.Factors related to Socio-economic

The social milieu in which people with diabetes live should be taken into consideration, as social exclusion or perceived support may generate circumstances that limit or assist adaptation and consequently affect medication adherence (Cheng et al., 2019).

The diabetic patient's family is an integral element of the therapeutic commitment because they actively support him by taking care of his health, motivating him, and preserving the stability of the household (Thapar et al., 2020).

2.4.5. Factors related to Patient-physician Relationship

Patient discontent, which is the foundation for the success of the process of excellent adherence to treatment, is caused by communication issues between the patient and the doctor's relationship. The following are the main reasons why the relationship between the patient and the doctor fails, according to Elsous et al.(2017):

1. Not listening
2. Treating the patient as a case
3. level of knowledge and understanding
4. Inability to remember information

It has been demonstrated that a patient's ability to stick to their medicine is significantly influenced by the nature of their relationship with their healthcare practitioner. Better adherence is a result of patients who are happier with their healthcare practitioner. It has been demonstrated that obtaining good glycemic control in patients is correlated with the availability of help from medical professionals (Graffigna et al., 2017).

It has been demonstrated that the encouragement given by nurse case managers helps diabetic patients stick to their food plans, medications, and weight loss goals. Another trial demonstrated that regular, frequent telephone contact with patients improved regimen adherence and improved cholesterol and blood pressure levels as well as glycemic management (Fuertes et al., 2017).

2.5.Theoritcal Framework

Social Cognitive Theory (SCT) is a broad behavioral theory that aims to explain how people pick up and keep socially acceptable behaviors. Its objective is to explain how people change their behavior through self-control and reinforcement to start goal-directed behavior that can be maintained over time, to put it more precisely. When attempting to comprehend DSM, experts are primarily interested in the issue of how people maintain goal-directed behavior. In order to further support and promote the use of SCT in creating treatments, research has repeatedly examined the usefulness of SCT for explaining or predicting performance of diabetic self-care tasks (Thojampa & Sarnkhaowkhom, 2019).

The central idea of SCT is mutual determinism, which holds that environmental, social, and behavioral components constantly and dynamically interact with one another to support or obstruct a given behavior (Schunk & Usher, 2012). The variables of interest in this study fall under the category of second-type health behavior (DM): A behavioral element that differs from person to person and can be modified and changed over time is treatment adherence for diabetes.

2.6.Previous Studies

The First Study: Similarly, Sendekie et al. (2022) conducted a study to assess medication adherence and its influence on glycemic control in patients with concurrent type 2 diabetes. Their analysis encompassed a total of 403 samples. Alarmingly, the majority (76.9%) of participants exhibited low levels of medication adherence. The study identified self-monitoring of blood glucose (SMBG) practices, monthly income, the number of prescribed medications, and underlying medical conditions as significant predictors of medication adherence. Notably, a substantial proportion of subjects (74.7%) experienced subpar glycemic control. Patients with high medication adherence were less likely to exhibit poor glycemic control compared to their less adherent counterparts, emphasizing the crucial link between adherence and glycemic outcomes. The study illuminated the intricate relationship between various medical factors and medication adherence, underscoring the need to prioritize improving medication adherence in the management strategies for patients with comorbid conditions.

In the study conducted by Pourhabibi et al. (2022), the researchers investigated factors influencing treatment adherence among type 2 diabetes patients. Their findings revealed that several variables played a significant role in determining the level of adherence. Notably, health literacy, HbA1c levels, and income emerged as the most influential predictors. As patients' health literacy improved, so did their adherence to treatment protocols. Additionally, patients with higher adherence exhibited lower HbA1c levels, indicating improved diabetes management. Income levels also had a substantial impact, with individuals possessing sufficient income scoring 2.54 points higher on the treatment adherence scale compared to those with insufficient income, while those with somewhat sufficient income scored 0.76 points higher. This study underscores the multifaceted nature of factors affecting adherence to diabetes therapy. The findings highlight the

importance of designing interventions grounded in theory to enhance these determinants effectively.

The Second Study : Conversely, Ranjbaran et al. (2020) employed the health action process model (HAPA) to elucidate factors influencing medication adherence. They found that the goal of the activity, task self-efficacy, coping planning, and coping self-efficacy were pivotal factors affecting adherence. The HAPA inventory encompasses a diverse array of variables, notably various facets of self-efficacy. Therefore, researchers and healthcare practitioners are encouraged to incorporate this comprehensive model into interventional research and program development. Understanding and addressing these factors are paramount when devising interventions to bolster medication adherence among patients, especially those managing complex health conditions like type 2 diabetes.

The prevention, management, and treatment of type 2 diabetes mellitus hinge on adopting a healthy lifestyle, characterized by a balanced diet, regular physical activity, and minimizing sedentary habits. Successful engagement in these health behaviors is contingent on possessing the capability, opportunity, and motivation to do so. In the realm of type 2 diabetes management, it is imperative to consider not only these behaviors but also the underlying bio-psycho-social factors (Chater et al., 2020).

Mohamdy's study in 2020 shed light on the primary obstacle’s individuals face when striving to adopt a healthier lifestyle. Their findings indicated that adhering to a consistent and healthy schedule posed the most significant challenge, accounting for 19.4% of reported barriers. Job conditions and timing (14.3%) as well as feelings of laziness (13%) followed closely behind. Conversely, lack of awareness about healthier practices was identified as the least significant barrier, at just 5.3%. To promote behavior change effectively, the study recommended three key strategies: seeking counsel from a healthcare professional during routine visits

(26.3%), participating in support groups (18.4%), and utilizing electronic suggestions and reminders on cellphones (15%).

In a separate investigation by Asril et al. in 2020, the focus shifted to understanding the factors influencing health habits among type 2 diabetes patients. Their research uncovered that social support played a pivotal role, explaining a substantial 48.20% of the variance in health behaviors (R2 = 0.482) among these patients. Consequently, it is imperative for relevant organizations to develop a model for promoting healthy lifestyle choices among the type 2 diabetes patient community, with a strong emphasis on fostering social support.

The Third Study: Lastly, Rezaei et al. 2019 qualitative study, conducted using traditional content analysis, explored the factors hindering medication adherence in type 2 diabetes patients. It identified several barriers, including patients' awareness of their physical condition and techniques for maintaining internal balance. Additionally, financial and social challenges, as well as knowledge and skill acquisition related to living with the disease, were identified as hurdles. The study recommended bolstering patients' trust in their medical teams and aligning their beliefs. Nurses should tailor healthcare suggestions to each patient's unique circumstances and strive to alleviate existing difficulties.

The Four Study: Hackett et al. (2018) delved into whether a diagnosis of type 2 diabetes prompts individuals to alter their health behaviors. The study revealed that the T2D group tended to exercise less and consume less alcohol. Across the entire sample, there was a decline in smoking, alcohol consumption, and physical activity, while fruit and vegetable intake decreased, and sedentary behavior increased. Notably, smoking exhibited a pronounced decrease in the T2D group. However, for most other behaviors, there was limited evidence of significant change following a T2D diagnosis. Given the pivotal role of lifestyle in the trajectory of

type 2 diabetes, it is imperative to develop effective strategies for fostering behavioral modifications in this population.

The Five Study: In their 2017 study, Putra and Toonsiri aimed to identify the key determinants of health behavior among type 2 diabetes patients. Knowledge, socioeconomic status, and family support emerged as the primary influencers of health behavior in this group. Additionally, factors like stress management, health beliefs, and access to healthcare services played significant roles. When crafting interventions to promote healthy behaviors within the type 2 diabetes community, these multifaceted aspects demand careful consideration.

The Sex Study: In a study by Rosiek et al. (2016), the interplay between the health behaviors of type 2 diabetes patients and their impact on quality of life was investigated. The study involved 50 participants from the Kuyavian-Pomeranian Voivodeship. Utilizing the Health Behavior Inventory and the Satisfaction with Life Scale, the research uncovered a positive correlation between the vigor with which healthier habits were embraced and overall well-being. This finding underscores the significance of these health behaviors.

Chapter Three

Methodology

Chapter Three

Methodology

Scientific research technique is a collection of scientific standards, criteria, and controls that are followed when conducting research. As a result, scientific research methodology is a key aspect of how successful scientific research is built and organized. One of the most important controls of scientific research is that it be organized and accurate, so that everyone who reads it and looks at its lines benefits from it. As a result, we should discuss the various scientific research methods that a researcher can employ during the course of conducting a well-structured scientific research. The study design, as well as all other scientific steps taken by the researcher from the beginning to the end of the investigation, will be described in this chapter.

3.1. Study Design

The descriptive correlational design of this study involves gathering data through direct questioning of study participants regarding their treatment adherence and quality of life. Given that the study addresses a contemporary issue and utilizes direct questioning as its primary data collection method, the chosen research approach is correlational in nature. This approach is apt for this study's objectives, which aim to elucidate the relationship between two key variables: Health Behaviors and Treatment Adherence. This study was conducted over a six-month period, commencing on October 1st, 2022, and concluding on March 29th, 2023.

3.2. Administrative Arrangements

Before collecting the study data, the following official clearances were sought from appropriate authorities:

1. Approval from the University of Babylon/ College of Nursing Council for the study (Appendix A1).
2. Official permission has been obtained from Babylon Health Directorate (Appendix A2) in order to formally access to Diabetes and Endocrinology Center.
3. An official is obtained from Diabetes and Endocrinology Center on Hilla City (Appendix A2)
4. In addition, the consent of the patients to participate in the study, after explaining the objectives and usefulness of the study to them and assuring that all information provided will be confidential and for scientific and research purposes (autonomy and privacy).

3.3. Ethical Considerations

Ethical obligations are one of the most important things that the researcher must follow and abide it when doing the study. Before the starting of collect the data from the community that has been identified for the study, the researcher should clarify the main purpose and desired goal of conducting this study for the sample to be including in the study, as well as adhere to the strict confidentiality of the data taken from the study sample and pledge to use it for scientific purposes related to the study only.

Before the starting of gathering the data from the sample who are participating in the study, the researcher given a brief explanation about the scientific background of the research and the purpose of conducting. Patients were verbally informed about the study aims and were asked to participate and this participation were voluntary. After they consented to take part in the study, they were given an anonymous questionnaire to complete in order to protect the participants' privacy (Appendix A).

3.4. Setting of the Study

The study was conducted at Diabetes and Endocrinology Center in Hilla City. It is one of the health institutions affiliated to the Babylon Health Directorate. It is an integrated center for the care of patients with diabetes and its complications. It is the only center in Babylon Governorate.

3.5. Sample of the Study

A non-probability purposive sample included in present study are patients with type II diabetes mellitus (T2DM) is selected according to non-probability sampling approach with a total of (200) patients who are attended Diabetes and Endocrinology Center in Hilla city. This purposive sample is selected according to the following criteria include:

3.5.1. Inclisions criteria:

1. Patients who are diagnosed with T2DM for last 6 moth and more.
2. Patients who are aged 18 years and more.
3. Patients who are agree to include in study sample.

3.5.2. Exclusion Criteria:

1. Patients who are chosen for pilot study.
2. Patients who refused to participate in present study.

3.6. Study Instruments

The questionnaire is one of the means to help collect data that contribute to achieving the results expected by the study, so the researcher designed this questionnaire, which aims to clarify the study objectives and significance by obtaining answers to the study's questions. The questionnaire includes the following parts (Appendix B):

3.6.1. Socio-Demographic Characteristics

Patients characteristics include age, gender, monthly income, marital status, education level, occupation, duration of T2DM and associated comorbidity.

3.6.2. Health behaviours

Health behaviours among patients with T2DM was constructed according to the previous studies and literature review. A total of (25) items of health behaviour measured on 3-level type of Likert Scale (*3=Always, 2=Sometime, 1=Never*). Accordingly, points can be taken range from 25-75. The higher average defined as good health behaviours.

3.6.3. Medication Adherence Scale (MAS-12)

This scale used for assessing patients with chronic disease treatment adherence adopted and developed by Ueno et al. (2018). A total of (12) items of treatment adherence measured on 3-level type of Likert Scale (*3=Always, 2=Sometime, 1=Never*). Accordingly, points can be taken range from 12-36. The higher average defined as high level of treatment adherence.

The researcher adhered to the rules of writing the questionnaire due to the importance of the type of information that the researcher is keen to be sufficient and comprehensive for all aspects of the problem and to be reliable and reliable. Vague and complex questions were avoided. The type of questions were of the closed type requiring an answer with reference to what is relevant.

3.7. Validity of the Questionnaire

The term "validity" refers to the extent to which the collected information accurately represents the content of the actual examination. Essentially, validity measures whether the instrument effectively assesses what it was designed to assess. There are four main types of validity, which include face, content, construct, and criterion validity (Taherdoost, 2016).

In order to ensure the study protocol and study instrument's validity, a thorough process of revision and modification was undertaken. Expert professionals from various scientific disciplines, each with over a decade of experience in their respective fields, were engaged in this process. The researcher requested each expert

to evaluate the study instrument in terms of its content, simplicity, relevance, style, and suitability. These experts assessed the instrument's scientific content, the flow of information, and its ability to effectively serve the purpose of sample collection. Consequently, the instrument was modified based on the recommendations provided by these experts.

Content validity was established through the input of a panel of nine experts, consisting of six faculty members from the College of Nursing at the University of Babylon and three faculty members from the College of Nursing at the University of Kufa (see Appendix C).

The feedback from these experts indicated that minor adjustments were necessary for some items, and these adjustments were implemented in accordance with their suggestions. Subsequently, the final draft of the instrument was completed and made ready for use in the study.

3.8. Pilot Study

This preliminary study was carried out to determine the study tool's stability and credibility, as well as its clarity and efficiency, as well as the standard time required to collect data for each subject, which can be estimated during the interview procedures, and to identify any difficulties that may arise.

The pilot study aimed to achieve the following objectives.

1. Adequacy of research tools development and testing
2. Evaluation of the instrument's viability.
3. Identifying any logistical issues that may arise as a result of the proposed methods.
4. Assessment of proposed data analysis approaches for the detection of potential issues.
5. The researcher's time estimate during data collecting.

3.8.1. Results of pilot study

1. The questionnaire is reliable.
2. The time required for answering the questionnaire ranged from (15-20) minutes.
3. The instrument items were clarified and understood the phenomenon underlying of the study (Table 3-1).

The accepted coefficients reliability of the used study questionnaire regarding internal consistency (Alpha Cronbach) is 0.70 (as shows in table 3-1) by findings calculation in which the instrument was effective, significant, and valid to the research topic of (health behaviour and treatment adherence among patients with T2DM).

3.8.3. Reliability of the Questionnaire:

A study was conducted with 20 patients who were individually interviewed by a researcher. The researcher introduced the participants and asked them to share their opinions on their health behaviors and treatment adherence. The participants were also given a questionnaire to assess its simplicity, understanding, and the time required to complete it. The interviews lasted around 20-25 minutes each. The data from the pilot study were analyzed, and no changes were made. The Cronbach α value indicated a high level of reliability, ranging from 0.70 and above. The experimental study was then conducted, excluding the participants from the original sample.

Table3-1: Reliability of the Studied Questionnaire (*n=20*)

Reliability Statistics			
Variables	**N of Items**	**Cronbach's Alpha**	**Ass.**
Health Behaviours	**25**	**.82**	**Acceptable**
MAS-12	**12**	**.87**	**Acceptable**

This table is statistically formed to show the reliability coefficient for the study instrument. The calculated result shows that the questionnaire is reliable measure to study the phenomenon of health behaviours and Treatment Adherence among Patients with Diabetes Mellitus Type II on the same population at any time in the future.

3.9. Data Collection

The data collection process occurred between February 27th and April 29th 2023. The questionnaire was administered to the study participants following approval from the Babylon Health Directorate and a thorough validation process to ensure its reliability and validity.

The researcher conducted individual interviews with patients diagnosed with Type 2 Diabetes (T2DM). During these interviews, the researcher explained the questionnaire's instructions, addressed any participant queries regarding the form, encouraged their participation, and expressed gratitude for their cooperation. Each interview lasted approximately 15-20 minutes, adhering to essential steps integrated into the study design, encompassing the following:

1. Identification of the specific data to be gathered through the questionnaire, aligned with the study's research questions.
2. Determination of the questionnaire's methodological approach and format.
3. Specification of the criteria governing the type of responses expected within the questionnaire.
4. Presentation of the questionnaire to a supervisor for feedback, incorporating their insights and suggested modifications.
5. Solicitation of opinions and observations from a panel of experts regarding the questionnaire's development, with subsequent adjustments based on their feedback.

6. Conducting a reliability test by distributing the questionnaire to a sample group of 20 patients.
7. Finalizing the questionnaire in its definitive form, including a review and print process, in preparation for its utilization in data collection.

3.10. Statistics Data Analysis

To comprehensively analyse the data collected from the study sample and derive meaningful results, the researcher employed a combination of statistical tools and software, namely SPSS-24 and Microsoft Excel (2010). These analytical methods were instrumental in processing, organizing, summarizing, and categorizing the data. The goal was to uncover relationships between various variables and ultimately obtain conclusive research findings through a series of statistical tests.

3.10. Descriptive Approach

The descriptive approach encompasses a range of mathematical and statistical techniques aimed at quantitatively characterizing key aspects of the data. This is achieved through the use of tables and charts, facilitating a clear and concise presentation of the data for easy comprehension. The analysis included:

Statistical Tables:

These were used to display frequencies (No.) and percentages (%).

Calculation of Mean Scores (M.s.):

The mean score, often denoted as M±, was computed to provide an overall average score. This calculation involved determining the total mean of scores using the formula:

Total Mean of Scores = (Maximum Total Scores - Minimum Total Scores) / Levels

Health behaviors

Poor= 25-41.66

Moderate= 41.67-58.33

Good= 58.34-75

Treatment adherence

Low= 12-20

Moderate= 20.1-28

High= 28.1-36

Standard Deviation (SD):

Standard deviation was used to measure the degree of variation within the data.

3.10.2. Inferential Approach

The inferential approach delved deeper into the data analysis process, aiming to draw conclusions and make inferences based on the sample data. Several statistical tests were utilized:

Cronbach's Alpha:

The correlational coefficient Cronbach alpha was employed to estimate the internal consistency of the study tool.

Analysis of Variance (ANOVA):

ANOVA was employed to identify differences in dependent variables concerning independent variables. This was particularly useful when examining treatment adherence in relation to various socio-demographic characteristics, but only when dealing with more than two class variables. A significance level (Sig.) of 0.05 was used to determine statistical differences.

Independent Sample t-test:

The independent sample t-test was utilized to ascertain differences in dependent variables in relation to independent variables, specifically when examining treatment adherence within different socio-demographic characteristics

with two class variables. A significance level (Sig.) of 0.05 was considered indicative of statistical differences.

Pearson's Correlation Coefficient (r):

Pearson's correlation coefficient was employed to establish relationships between study variables, such as the correlation between treatment adherence and health behaviors. A negative correlation was denoted as (-r), while a positive correlation was represented as (+r). Significance levels of 0.01** and 0.05* were applied to determine the strength and significance of these correlations.

Simple Linear Regression:

Simple linear regression was employed to assess the predictive relationship between health behaviors and treatment adherence. A negative prediction was indicated by (-β), while a positive prediction was expressed as (+β).

Chapter Four

Results of the Study

Chapter Four

Results of the Study

Table 4-1. Distribution of Study Sample by their Socio-demographic Variables (SDVs)

SDVs	Classification	No.	%
Age (mean age= 44.03)	<20 years old	18	9.0
	30-39 years old	58	29.0
	40-49 years old	66	33.0
	50-59 years old	37	18.5
	60 and older	21	10.5
Gender	Male	77	38.5
	Female	123	61.5
Monthly income	Insufficient	31	15.5
	Somehow sufficient	127	63.5
	Sufficient	42	21.0
Marital status	Single	24	12.0
	Married	133	66.5
	Separated	13	6.5
	Divorced	15	7.5
	Widow	15	7.5
Education level	Illiterate	25	12.5
	Read & write	1	.5
	Elementary	34	17.0
	Middle school	52	26.0
	High school	8	4.0
	College	80	40.0
Occupation	Employee	32	16.0
	Free-business	101	50.5
	Unemployed	48	24.0
	Retired	19	9.5
Duration of T2DM	<5 years	31	15.5
	5-10 years	109	54.5
	>10 years	60	30.0
Associated Comorbidities	Yes	91	45.5
	No	109	54.5

The findings reveal distinctive participant characteristics. The average age was 44.03 (±11.38), with the age group of 40 to 49 years old comprising the largest portion at 33%. Regarding gender distribution, females constituted the majority at 61.5%. A significant portion of participants indicated an adequate income (63.5%). Moreover, the study's sample predominantly consisted of married individuals

(66.5%), with a substantial portion having completed college education (40%). Notably, a significant percentage (50.5%) were engaged in freelance or independent business activities. The majority of participants had resided in their current domicile for 5-10 years (54.5%) and reported having no associated comorbidities (54.5%).

Table 4-2. Healthy Behavior among Patients with T2DM

List	Health Behaviour Items	Never	Sometime	Always	M.s	Ass.
		No.(%)	No.(%)	No.(%)		
1	Eat my meals regularly	57 (28.5)	141 (70.5)	2 (1.0)	1.73	Moderate
2	I am interested in doing my favorite sport	109 (54.5)	58 (29.0)	33 (16.5)	1.62	Poor
3	I do activities that make me relax, such as (walking, taking a shower...)	92 (46.0)	92 (46.0)	16 (8.0)	1.62	Poor
4	I eat meals that contain all nutrients, including sugars	74 (37.0)	85 (42.5)	41 (20.5)	1.84	Moderate
5	I do fitness training regularly	86 (43.0)	75 (37.5)	39 (19.5)	1.77	Moderate
6	I keep myself from getting into accidents	52 (26.0)	146 (73.0)	2 (1.0)	1.75	Moderate
7	I eat a balanced diet, medication dosage, and physical activity	71 (35.5)	123 (61.5)	6 (3.0)	1.68	Moderate
8	I sleep enough hours	92 (46.0)	100 (50.0)	8 (4.0)	1.58	Poor
9	I do my best to keep specific times for exercise	73 (36.5)	107 (53.5)	20 (10.0)	1.74	Moderate
10	I do exercises to reach and maintain the ideal body weight	111 (55.5)	48 (24.0)	41 (20.5)	1.65	Poor
11	I do things that make me feel energetic	127 (63.5)	63 (31.5)	10 (5.0)	1.42	Poor
12	I monitor my blood sugar before and after exercise	62 (31.0)	132 (66.0)	6 (3.0)	1.72	Moderate
13	Join my friends in fun activities	111 (55.5)	87 (43.5)	2 (1.0)	1.46	Poor
14	I avoid drinking caffeine-containing drinks (tea, coffee, cola)	81 (40.5)	93 (46.5)	26 (13.0)	1.73	Moderate
15	I try to keep my body weight in the right range	68 (34.0)	130 (65.0)	2 (1.0)	1.67	Moderate
16	Take care of my personal hygiene and good looks	103 (51.5)	95 (47.5)	2 (1.0)	1.50	Poor
17	I brush my teeth constantly	81 (40.5)	111 (55.5)	8 (4.0)	1.64	Poor
18	I follow the diabetes program when a change to the daily routine is required	106 (53.0)	86 (43.0)	8 (4.0)	1.51	Poor
19	I constantly check my feet	99 (49.5)	99 (49.5)	2 (1.0)	1.52	Poor
20	I take the exact dose of my medication	100 (50.0)	94 (47.0)	6 (3.0)	1.53	Poor
21	I keep medication dose times	93 (46.5)	101 (50.5)	6 (3.0)	1.57	Poor
22	Stick to the dosage prescribed by the doctor	95 (47.5)	97 (48.5)	8 (4.0)	1.57	Poor
23	I have enough information about the medicines I use for diabetics	78 (39.0)	114 (57.0)	8 (4.0)	1.65	Poor
24	I eat my meals at the same time every day	52 (26.0)	140 (70.0)	8 (4.0)	1.78	Moderate
25	I cut my toenails the right way	87 (43.5)	111 (55.5)	2 (1.0)	1.58	Poor

Level of Assessment (Poor= 1-1.66; Moderate=1.67-2.33; Good=2.34-3)

In the realm of statistical means, the presented table clearly illustrates that individuals with T2DM exhibited suboptimal responses to health behaviors. This is evident from the notably low mean scores (M.s≥1.66) across all evaluated items of the scale, with the exception of specific items (1, 4, 5, 6, 7, 9, 12, 14, 15, and 24), where responses were moderately expressed.

Table 4.3. Overall Health Behaviour of Patients with T2DM

Health Behaviour	No.	%	*M (±SD)*	*Ass.*
Poor	119	59.5	*40.83 ± 5.34*	*Poor*
Moderate	79	39.5		
Good	2	1.0		
Total	200	100.0		

M: Mean for total score, SD=Standard Deviation for total score

The findings revealed that a significant proportion (59.5%) of patients with T2DM exhibited suboptimal health behaviors, as indicated by a relatively low overall mean score of 40.83 (±5.34).

Table 4-4. Treatment Adherence among Patients with T2DM

List	Treatment Adherence Items	Responses	No.	%	M.s	Ass.
1	Over the past 3 weeks, I have taken the prescribed daily dosage of my medication.	Never	163	81.5	1.25	Low
		Sometime	24	12.0		
		Always	13	6.5		
2	Over the past 3 weeks, I have followed the instructions about when or how often to take my medication.	Never	171	85.5	1.19	Low
		Sometime	21	10.5		
		Always	8	4.0		
3	I have stopped taking medication based on my own judgment (not including times when I forgot to take my medication)	Never	94	47.0	1.59	Low
		Sometime	95	47.5		
		Always	11	5.5		
4	I feel comfortable asking my healthcare provider about my medication.	Never	131	65.5	1.42	Low
		Sometime	55	27.5		
		Always	14	7.0		
5	My healthcare provider understands when I tell him/her about my preferences in medication taking.	Never	113	56.5	1.48	Low
		Sometime	79	39.5		
		Always	8	4.0		
6	My healthcare provider understands when I	Never	65	32.5	1.70	Moderate

	explain to him/her about my past medication including previous allergic.	Sometime	131	65.5		
		Always	4	2.0		
7	I understand both the effects and the side effects of my medication.	Never	105	52.5	1.52	Low
		Sometime	87	43.5		
		Always	8	4.0		
8	I report side effects, allergic reactions, or unusual symptoms caused by the medication.	Never	75	37.5	1.74	Moderate
		Sometime	102	51.0		
		Always	23	11.5		
9	I personally search for and collect information that I want about my medicine.	Never	69	34.5	1.74	Moderate
		Sometime	114	57.0		
		Always	17	8.5		
10	I accept the necessity of taking medication in the prescribed manner to treat my illness.	Never	92	46.0	1.72	Moderate
		Sometime	73	36.5		
		Always	35	17.5		
11	Taking medication is part of my everyday life, just like eating or brushing my teeth.	Never	115	57.5	1.49	Low
		Sometime	72	36.0		
		Always	13	6.5		
12	I sometimes get annoyed that I have to keep taking medicine every day.	Never	64	32.0	1.70	Moderate
		Sometime	132	66.0		
		Always	4	2.0		

Level of Assessment (Low= 1-1.66; Moderate=1.67-2.33; High=2.34-3)

In a statistical context, the table reveals that individuals with T2DM exhibited limited responsiveness to treatment adherence, which is evident from the consistently low mean scores (M.s≥1.66) across all assessed scale items, except for items (6, 8, 9, 10, and 12), where the responses were moderately expressed.

Table 4.5. Overall Treatment Adherence among Patients with T2DM

Treatment Adherence	No.	%	*M (±SD)*	*Ass.*
Low	176	88.0	*18.54 ± 3.93*	*Low*
Moderate	13	6.5		
High	11	5.5		
Total	200	100.0		

M: Mean for total score, SD=Standard Deviation for total score

The findings revealed that a significant portion (88%) of the patients diagnosed with Type 2 Diabetes (T2DM) exhibited suboptimal adherence to their treatment regimen. This was evident from the calculated low overall mean of 18.54 (±3.93).

4.6. Statistical Differences in Treatment Adherence among T2DM Patients with respect their Socio-Demographic Variables

Table 4-6-1. Treatment Adherence between Groups of Age

Age	Source of variance	Sum of Squares	d.f	Mean Square	*F-statistic*	*Sig.*
Adherence	Between Groups	1.744	4	.436	4.325	.002
	Within Groups	19.659	195	.101		
	Total	21.403	199			

The analysis of variance showed that there were statistically significant differences in treatment adherence between patients with respect to their age groups (*F=4.325; p=.002*).

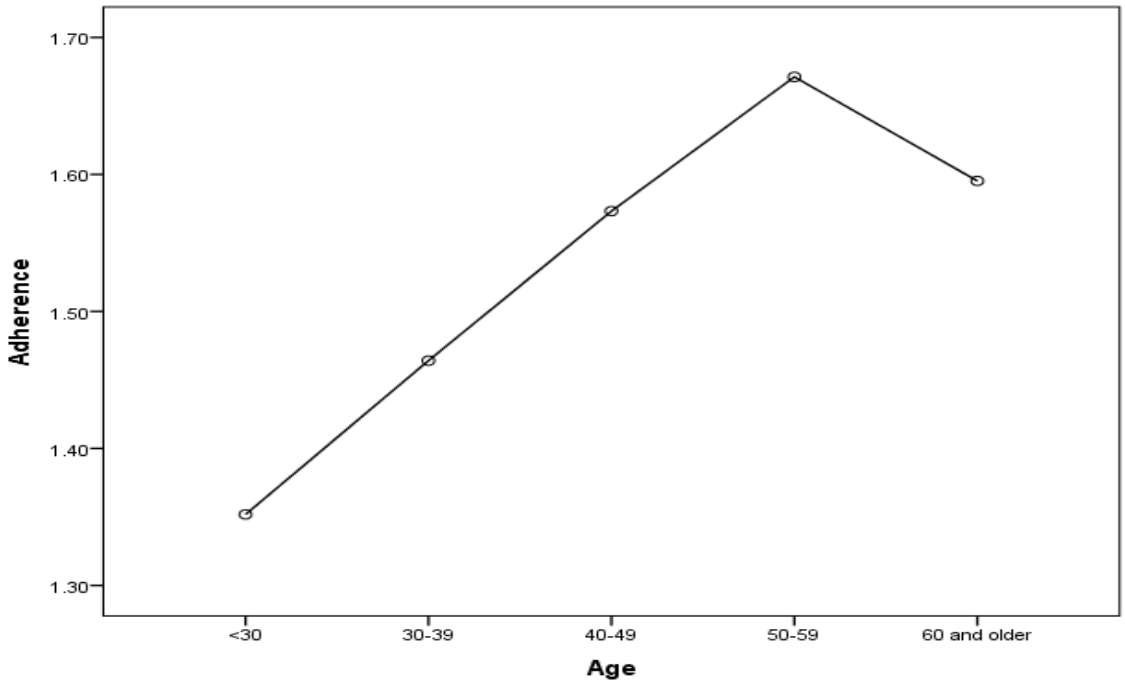


Fig. 4-1. Treatment Adherence between Groups of Age

.

Table 4-6-2. Treatment Adherence between Groups of Gender

Treatment Adherence	Gender	M	SD	Std. Error	t-value	d.f	Sig.
	Male	1.61	.470	.05362	2.396	198	.018
	Female	1.49	.180	.01627			

.

The independent sample *t-test* showed that there were statistically significant differences in treatment adherence between patients who are male and those who are female (*t=2.396; p= .018*).

Table 4-6-3. Treatment Adherence between Groups of Monthly Income

Income	Source of variance	Sum of Squares	d.f	Mean Square	*F-statistic*	*Sig.*
Adherence	Between Groups	2.249	2	1.124	11.565	.000
	Within Groups	19.154	197	.097		
	Total	21.403	199			

The analysis of variance showed that there were statistically significant differences in treatment adherence between patients with respect to their monthly income (*F=11.565; p=.000*).

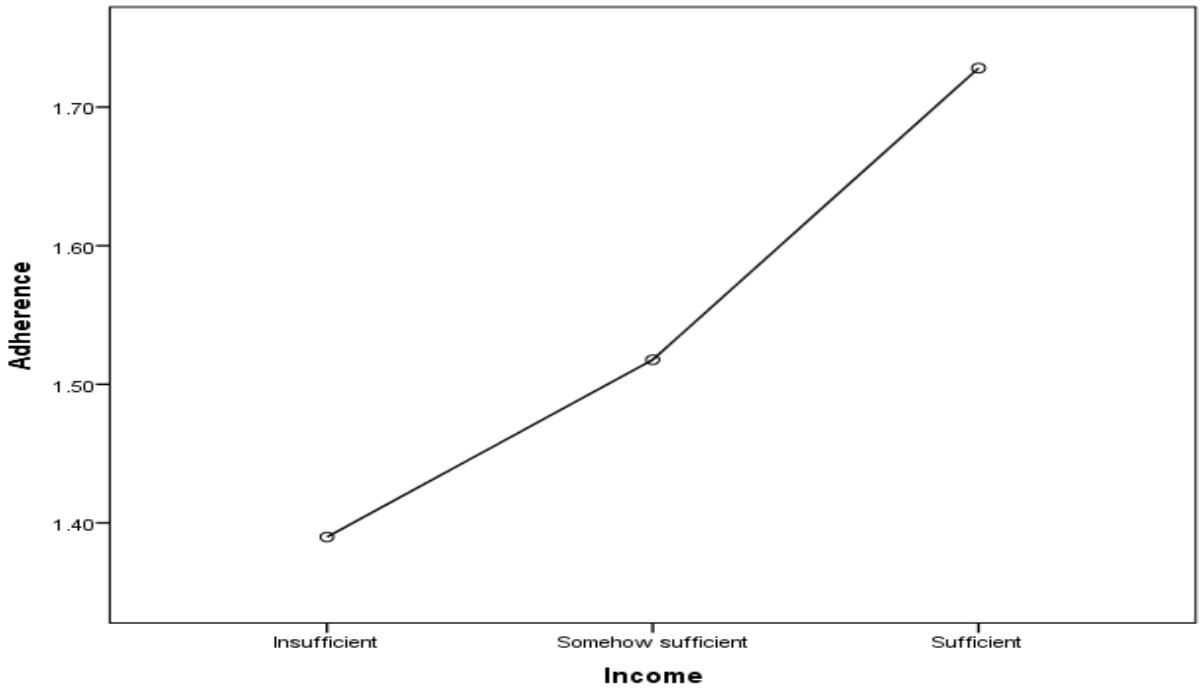


Fig. 4-2. Treatment Adherence between Groups of Monthly Income

Table 4-6-4. Treatment Adherence between Groups of Marital Status

Marital status	Source of variance	Sum of Squares	d.f	Mean Square	*F-statistic*	*Sig.*
Adherence	Between Groups	1.719	4	.430	4.257	.003
	Within Groups	19.684	195	.101		
	Total	21.403	199			

The analysis of variance showed that there were statistically significant differences in treatment adherence between patients with respect to their marital status (*F=4.257; p=.003*).

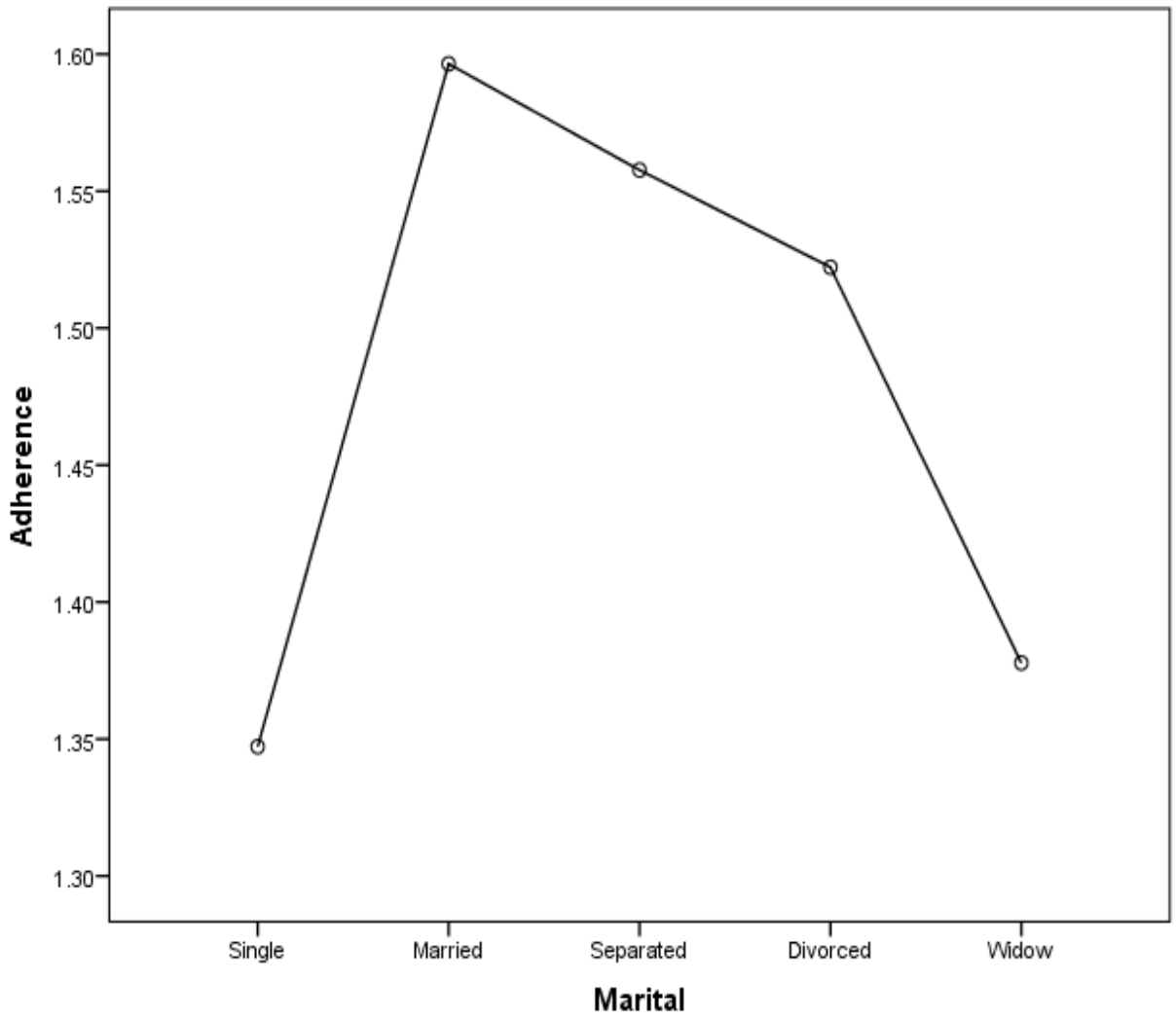


Fig. 4-3. Treatment Adherence between Groups of Marital Status

Table 4-6-5. Treatment Adherence between Groups of Education Level

Education level	Source of variance	Sum of Squares	d.f	Mean Square	*F-statistic*	*Sig.*
Adherence	Between Groups	1.086	5	.217	2.073	.070
	Within Groups	20.317	194	.105		
	Total	21.403	199			

The analysis of variance showed that there were no statistically significant differences in treatment adherence between patients with respect to their education level (*F=2.073; p=.070*).

Table 4-6-6. Treatment Adherence between Groups of Occupation

Occupation	Source of variance	Sum of Squares	d.f	Mean Square	*F-statistic*	*Sig.*
Adherence	Between Groups	.720	3	.240	2.276	.081
	Within Groups	20.682	196	.106		
	Total	21.403	199			

The analysis of variance showed that there were no statistically significant differences in treatment adherence between patients with respect to their occupation (*F=2.276; p=.081*).

Table 4-6-7. Treatment Adherence between Groups of Duration of T2DM

Duration	Source of variance	Sum of Squares	d.f	Mean Square	*F-statistic*	*Sig.*
Adherence	Between Groups	.852	2	.426	4.082	.018
	Within Groups	20.551	197	.104		
	Total	21.403	199			

The analysis of variance showed that there were statistically significant differences in treatment adherence between patients with respect to their duration of T2DM (*F=4.082; p=.018*).

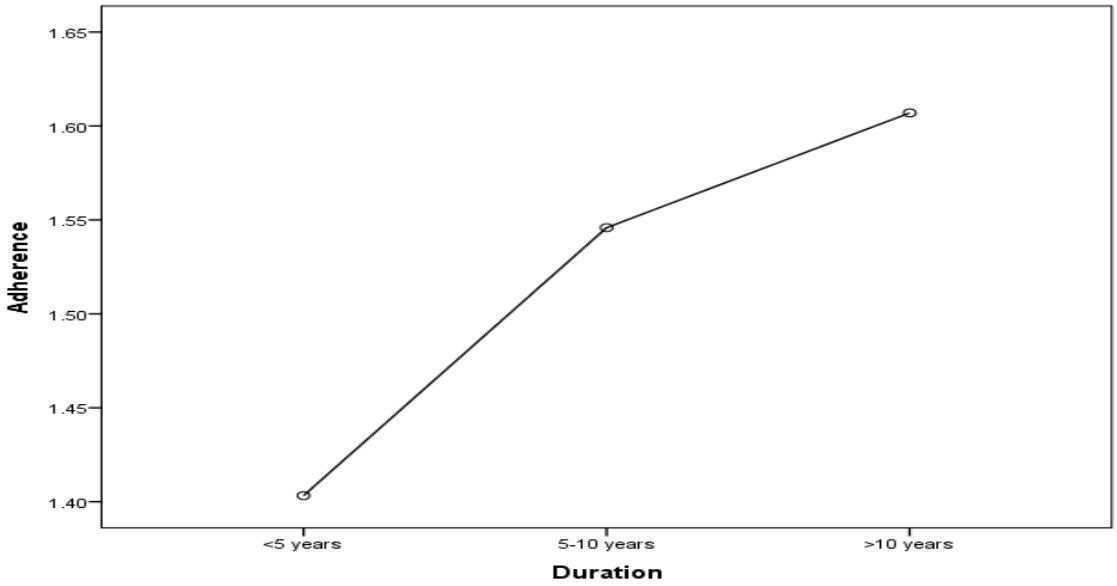


Fig. 4-4. Treatment Adherence between Groups of Duration of Diseases

Table 4-6-8. Treatment Adherence between Groups of Associated Comorbidities

	Chronic	M	SD	Std. Error	t-value	d.f	Sig.
Treatment Adherence	Yes	1.61	.395	.04150	2.867	198	.005
	No	1.48	.244	.02340			

.

The independent sample *t-test* showed that there were statistically significant differences in treatment adherence between patients who are associated comorbidities or not (*t=2.867; p= .005*).

Table 4-7. Factors Predict the Health Behaviour among Patients with T2DM

Variables	Unstandardized Coefficients		Standardized Coefficients	t	*Sig.*
	B	Std. Error	Beta		
Age	.004	.052	.008	.067	.946
Gender	-.120-	.082	-.114-	-1.470-	.143
Monthly income	.262	.059	.308	4.440	.000
Marital status	-.004-	.044	-.007-	-.082-	.935
Education level	.051	.025	.168	2.074	.039
Occupation	.012	.049	.020	.248	.804
Duration of T2DM	-.068-	.089	-.088-	-.771-	.441
Associated Comorbidities	-.043-	.110	-.041-	-.389-	.698

Dependent Variable: Health Behaviour

The results revealed significant associations between the predicted variables of health behaviors among patients with T2DM and their monthly income (β=0.308; p<0.001) as well as education level (β=0.168; p=0.039).

Table 4-8. Association between Treatment Adherence and Health Behaviours among Patients with T2DM

Correlation Statistics	1	2
1.Treatment Adherence	1	.406**
2.Health Behaviours	.406**	1

**. Correlation is significant at the 0.01 level (2-tailed).

The results indicate a noteworthy positive correlation between treatment adherence and health behaviors (*rs = .406, p < .001*).

Chapter Five

Discussion of the Study Result

Chapter Five

Discussion of the Study Results

Lack of compliance with diabetes treatment has been identified as a significant factor contributing to unfavourable diabetic outcomes. It is accountable for a substantial exacerbation of diabetes symptoms, leading to heightened rates of hospitalization and an escalation in overall healthcare expenditures for individuals with diabetes. Furthermore, non-adherence is linked to an increased susceptibility to all-cause hospitalization and mortality. Particularly in the case of Type 2 Diabetes Mellitus (T2DM) patients, non-adherence to anti-diabetic regimens stands out as a critical issue, driving both diabetes-related mortality and morbidity. This chapter is dedicated to the thorough analysis and discussion of research findings, which are presented in tabular format. These findings align directly with the objectives set forth in this report, encompassing the following key points:

5.1.Socio-Demographic Characteristics of the Study Sample

The average age of the participants was 44.03 years, with a standard deviation of 11.38. Notably, the age group of 40-49 years constituted the largest segment, accounting for 33% of the sample. These findings echo those of a prior study conducted in Baghdad, which demonstrated that individuals over the age of 40 were more susceptible to chronic diseases (Khalifa et al., 2022). Among such chronic ailments, diabetes stands out, often afflicting those in their later years.

Regarding gender distribution, females constituted the majority at 61.5%. This pattern could be attributed to the inclination of more women to partake in the study. This trend aligns with observations made in Kut City, where males tended to

outnumber females in visits to rehabilitation centers for chronic conditions (Juma Elywy et al., 2022).

In terms of monthly income, a significant proportion (63.5%) reported having moderately sufficient income. This aligns with outcomes from a study in Hilla, Iraq, which revealed that a substantial number of individuals with diabetes lacked adequate monthly income (Qassim et al., 2018). Unfortunately, this financial limitation poses challenges as diabetes care often necessitates higher expenditures.

Marital status distribution indicated that the majority (66.5%) were married. This mirrors findings from Baqubah City, Iraq (Mohammed & Abdulwahed, 2021), which is expected considering the advanced age of the participants. It's reasonable to anticipate a higher prevalence of married individuals within an older demographic.

Turning to education, 40% of participants reported having a college education, while 50.5% had pursued freelance business endeavors. This diverges from observations in Karbala city, Iraq, where a larger proportion of Type 2 diabetes patients had informal education, a trend potentially influenced by the predominant gender distribution (Khudhair & Ahmed, 2022). Disparities in education could also be attributed to differences in sample size.

Concerning the duration of diabetes, 54.5% had been living with the condition for 5-10 years, and a similar percentage reported no accompanying comorbidities. These findings align with methodological studies conducted in Iraq, reinforcing the prevalent trend (Qassim et al., 2018; Abusaib et al., 2020).

5.2.Health Behaviours among Patients with T2DM

A significant proportion (59.5%) of the study participants exhibited suboptimal behaviors in managing their condition (as shown in Table 4-3). This trend may stem from various factors, including a lack of awareness regarding the significance of comprehensive self-care practices among diabetic patients,

disparities in lifestyle choices, and variations in cultural and socioeconomic backgrounds. A corresponding study conducted among diabetic patients receiving follow-up care at both public health centers and private clinics in Addis Ababa reported a prevalence of inadequate diabetes-related health behaviors at 47.7% (Tassew et al., 2015).

The current study's findings underscore the prevalence of unsatisfactory health behaviors within individuals diagnosed with type II diabetes mellitus. Among these participants, a majority (59.5%) demonstrated poor behaviors, 39.5% exhibited moderate behaviors, and a mere 1% adhered perfectly to recommended practices. These statistics fall below the desired threshold. This indicates a clear need for interventions that encompass a holistic approach, incorporating both treatment and health education. Such an approach would substantially contribute to enhancing the overall well-being and health outcomes of diabetic patients.

Likewise, the diabetes management practices among Iraqis diagnosed with type II diabetes mellitus were found to be inadequate in both knowledge and execution. Notably, their recognition of the significance of self-management practices serves as a driving force behind their positive attitude toward participating in in-person educational sessions (Mikhael & Hassali, 2016).

These studies collectively emphasize the paramount importance of providing comprehensive diabetes health behavior education to patients. This education serves to augment patients' health literacy, knowledge, and skill set, essential for proficiently managing their diabetes and averting potential complications. Ultimately, this initiative aims to enhance the overall quality of life. Additionally, these educational programs should be meticulously tailored to align with the local cultural context and address the specific gaps present among residents.

Moreover, a pivotal strategy in ensuring optimal blood sugar control and minimizing associated complications is the implementation of self-management practices and diabetes medication interventions. Diabetes self-management education, an ongoing process designed to equip individuals with diabetes with the necessary knowledge, skills, and abilities for self-care, has been highlighted as indispensable (Hailu et al., 2021).

It is vital to acknowledge that health behaviors exert a substantial influence on preventing diabetes-related complications. Nurses, as integral members of the healthcare team, can play a pivotal role by executing health behavior-oriented educational interventions. These efforts contribute to empowering individuals with type 2 diabetes to take charge of their health and well-being. In this context, proactive involvement from nurses and the availability of healthcare resources, such as health centers, assume pivotal roles in closely monitoring patients' blood glucose levels. This can be achieved through home visits or routine health assessments, thereby offering comprehensive control over the management of type 2 diabetes.

5.3.Treatment Adherence among Patients with T2DM

The study aimed to evaluate treatment adherence rates among individuals with type 2 diabetes in Hilla city. Notably, a significant majority (88%) of the participants demonstrated low treatment adherence, as highlighted in Table 4-5. The variance in adherence levels and influencing factors across studies underscores the impact of societal and regional distinctions, encompassing cultural norms, traditions, and environmental factors.

This study's findings are consistent with similar investigations in Botswana (58.2%) and Addis Ababa, Ethiopia (54.8%) where patients exhibited partial adherence (Ali et al., 2017; Fadare et al., 2017). Conversely, a study conducted in Bangladesh reported higher medication adherence rates, with only 20% of participants failing to comply with their oral medication regimen (Saleh et al.,

2015). It is important to note that this disparity could be attributed to the non-standardized questionnaire utilized in the Bangladesh study. In contrast, our research aligns with an Indian study that employed a standardized medication adherence tool, revealing that over half (51.7%) of participants exhibited suboptimal adherence (Arulmozhi & Mahalakshmy, 2014).

Our current study underscores a noteworthy prevalence of moderate treatment adherence among patients with type 2 diabetes. This finding is mirrored in a recent study from Bangladesh, where 46.3% of participants demonstrated moderate adherence, while 53.7% displayed adherence ranging from low to high (Mannan et al., 2021). The congruence of these results can be attributed to the uniform questionnaire employed and the shared geographic region of data collection.

In contrast to our findings, several studies have reported lower adherence rates, such as 2.7% in Pakistan (Shams et al., 2016), 45.34% in India (Divya & Nadig, 2015), 45.5% in Kenya (Waari et al., 2018), 45.9% in the Northwestern region of Ethiopia (Abebe et al., 2014), and 51.3% at Zewditu Memorial Hospital in Ethiopia (Mesfin et al., 2017). This variance can be attributed to socio-demographic differences among respondents, with our study primarily including urban residents.

While treatment adherence remains pivotal in managing type 2 diabetes, inadequate health education has emerged as a significant impediment to patients' adherence (Kooshyar et al., 2013; Nelson et al., 2018; Hussain et al., 2020). Consequently, the lack of health awareness among patients underscores a critical concern for health officials, policy makers, and healthcare providers. To address this, health promotion programs should prioritize health literacy by employing accessible educational materials and leveraging the expertise of health education professionals (Mehrtak et al., 2018).

Based on the study outcomes, it is recommended to introduce educational and counseling services aimed at enhancing awareness and health literacy among individuals with diabetes. These interventions can encourage adherence to treatment regimens, ultimately contributing to improved health and quality of life. Policymakers and planners are urged to design and implement comprehensive educational initiatives to enhance the physical, mental, and social well-being of both patients with type 2 diabetes and their families.

5.4. Factors Associated with Treatment Adherence

5.4.1. Age Groups

The analysis of variance reveals significant disparities in treatment adherence among patients based on their age groups (refer to Table 4-6-1). Notably, an inverse relationship exists between age and treatment adherence, where the oldest cohort (70 years and older) demonstrates lower adherence levels (see Fig. 4-1). This trend resonates with findings from Singapore, showcasing an inverted U-shaped connection between patient age and medication adherence. This relationship is also apparent in adherence to antihypertensive medications. The diminished adherence within the oldest demographic could be attributed to cognitive decline, while the youngest group's reduced adherence might stem from competing life priorities (Lin et al., 2017).

Furthermore, a retrospective longitudinal study encompassing 4987 eligible patients from a Taiwanese medical center underscores the inverse correlation between age and treatment adherence. As age advances, treatment outcomes tend to exhibit a more negative trajectory during follow-up care (Sia et al., 2021). Despite certain factors affecting compliance rates in older individuals—such as forgetfulness, concurrent medication usage, and isolation—policymakers and those

involved in diabetes care must acknowledge that age wields a significant influence on treatment adherence (Ayele et al., 2019).

Conversely, a study conducted in Bangladesh identifies older age as a significant predictive factor for treatment noncompliance (Khan et al., 2022). This divergence could stem from the fact that younger patients place a greater emphasis on preserving their health for a longer life, while the elderly may exhibit concerns about complications and adverse effects associated with lifelong medications. This reported noncompliance rate aligns with previous research outcomes (Rana et al., 2019; Badi et al., 2019). Additionally, elderly patients with comorbidities often receive multiple medications, a practice known as polypharmacy, which in turn heightens the risk of medication nonadherence (Shams et al., 2016).

5.4.2. Gender Differences

Based on the results of an independent sample t-test, the study unveiled notable and statistically significant differences in treatment adherence between male and female patients, as illustrated in Table 4-6-2. Notably, the findings showcased that males exhibited a higher degree of adherence to treatment compared to their female counterparts. This trend aligns with previous research conducted across multiple regions, including Kenya, Ethiopia, Uganda, and Tanzania (Rwegerera et al., 2014; Abate et al., 2017; Waari et al., 2018; Waari, 2019).

These consistent patterns are echoed by several other investigations. In a study carried out in Nepal, the outcomes demonstrated that females were 2.4 times more prone to exhibit suboptimal treatment adherence in comparison to males (Adhikari & Baral, 2021). Similar observations were made in a study conducted in Pokhara, Nepal, revealing that women displayed lower efficacy in adhering to diabetes-related protocols (35%), in contrast to their male counterparts (65%) (Shrestha et al., 2013). These variations might stem from gender-specific differences within social structures, leading to disparities in lifestyle adjustments

like exercise routines, medication compliance, and overall adherence to care plans (Dedefo et al., 2019).

5.4.3. Monthly Income

The analysis of variance has revealed statistically significant variations in treatment adherence among patients, specifically in relation to their monthly income as presented in Table 4-6-3. Notably, these differences favor individuals with higher incomes, illustrating a positive correlation between monthly income and treatment commitment, as illustrated in Figure 4-2. Consequently, patients grappling with chronic conditions such as T2DM could potentially experience substantial advantages by participating in Iraq's health insurance systems, which offer optimal pre-paid healthcare coverage. This coverage would effectively shield them from the burden of exorbitant healthcare costs associated with their medications and treatments.

The cost of medication emerges as a pivotal factor influencing patients' dedication to their prescribed regimens. In a study conducted in Nigeria, an overwhelming 51.32% of participants regarded their medications as financially inaccessible (Awodele et al., 2015). Likewise, in the present study, financial constraints emerged as the predominant rationale behind treatment non-adherence.

Furthermore, this investigation underscores that individuals with modest monthly incomes are more susceptible to lower adherence rates compared to their counterparts with higher earnings. This finding is consistent with prior research (Taha et al., 2013; Morgan & Lee, 2017; Kim et al., 2022), which suggests that patients facing economic hardships often forego medications due to affordability concerns.

The alignment between our findings and research conducted in the United States and Iran reinforces our conclusions, suggesting that higher income levels indeed correlate with enhanced treatment adherence (Kirkman et al., 2015;

Babaniamansour et al., 2020). Those with greater financial means tend to avail services from both public and private sectors, including more advanced medications and personalized care. Conversely, individuals with constrained financial resources tend to prioritize basic necessities over medical treatments, potentially compromising their adherence to prescribed regimens.

This insight underscores the significance of healthcare providers and prescribers acknowledging the socio-economic circumstances of patients. Effective communication regarding the affordability of prescribed medications is essential. Moreover, patients could derive considerable benefits from Iraq's community-based health insurance systems, which offer pre-paid coverage options that mitigate the risk of catastrophic healthcare expenses.

This study emphasizes the profound impact of financial factors on treatment adherence and underscores the need for tailored approaches that factor in patients' socio-economic status. By fostering transparent communication and offering accessible healthcare coverage, healthcare providers can facilitate improved treatment commitment and ultimately enhance patients' overall well-being.

5.4.4. Marital Status

In the present study's findings, notable statistical discrepancies in treatment adherence among patients were observed in relation to their marital status (refer to Table 4-6-4). The outcomes indicated that treatment adherence tended to be more pronounced among married individuals compared to those who were single, divorced, or widowed, with the latter group demonstrating lower adherence rates (see Fig. 4-3). This outcome aligns with findings reported in Qatar (Othman et al., 2022; Al-Mutawaa et al., 2022). It's worth noting that a significant number of married patients diagnosed with Type II Diabetes reside with their families. Consequently, adherence to treatment often becomes integrated into their familial

and social lives, wherein the support and encouragement of family members and friends play a pivotal role in facilitating adherence.

5.4.5. Duration of T2DM

The study reveals significant disparities in treatment adherence among patients in relation to the duration of their diabetes mellitus (DM), as demonstrated in Table 4-6-7. Notably, individuals with a more extended history of diabetes mellitus exhibited a higher propensity for treatment adherence. This phenomenon may be attributed to the heightened attention that patients with multiple chronic conditions allocate to their health status. Moreover, the regularity in daily medication intake ingrained in these individuals' routines could contribute to their greater likelihood of adhering to medical regimens, as depicted in Figure 4-4.

These findings align with previous research conducted in various regions, such as Hulu Langat District (Bagonza et al., 2015), Istanbul in Turkey (Yavuz et al., 2015), and Gaza Strip, Palestine (Elsous et al., 2017). These studies collectively assert that an extended duration of diabetes mellitus without complications corresponds to a higher inclination and commitment to treatment adherence. Notably, optimal medication adherence during the early stages of diabetes emerges as a pivotal factor in maximizing the efficacy of pharmaceutical interventions, as emphasized by Lin et al. (2017).

Based on these insights, there emerges a pressing need for health policies and interventions targeted at enhancing treatment adherence among individuals recently diagnosed with diabetes. This proactive approach can contribute significantly to the overall effectiveness of pharmaceutical therapies and the improved management of diabetes mellitus.

5.4.6. Associated Comorbidities

Based on the analysis using an independent sample t-test, the results demonstrate significant disparities in treatment adherence between patients with and

without associated comorbidities (refer to Table 4-6-8). These findings align with a study conducted in Northwest Ethiopia, which also highlighted low medication adherence coupled with a notable correlation with inadequate glycemic control. Furthermore, this prior research indicated a link between medication adherence, the number of medical conditions, and the complexity of medication regimens (Sendekie et al., 2022).

In light of these outcomes, it is evident that interventions targeting the management of Type 2 Diabetes Mellitus (T2DM) patients with comorbidities should place a strong emphasis on enhancing medication adherence. Regrettably, only a minority of individuals diagnosed with T2DM and an additional cardiovascular comorbidity adhere fully to treatment guidelines. This worrisome trend may substantially contribute to heightened mortality rates within this patient population in real-world clinical settings (Gabler et al., 2021).

5.5. Factors Predicted Health Behaviour among Patients with T2DM

Based on the outcomes of the simple linear regression analysis, the current study highlights that monthly income (β= .308; p= .000) and education level (β= .168; p= .039) serve as predictive factors for health behaviors among individuals diagnosed with Type 2 Diabetes Mellitus (T2DM), as depicted in Table 4-7. In essence, higher monthly income and educational attainment correspond to more favorable predicted health behaviors. Notably, lower socioeconomic status tends to be associated with diminished educational attainment, potentially elevating risk factors such as smoking, physical inactivity, and suboptimal diet quality. This cascade of risk factors contributes to an increased incidence of Type 2 diabetes, consequently influencing the inclination to engage in health-promoting behaviors (Williams et al., 2010; Conner et al., 2013).

Moreover, the correlation between lower socioeconomic status and inadequate access to healthcare resources further exacerbates the situation. Particularly, financial constraints can hinder an individual's perception of healthcare quality, leading to hesitance in utilizing health services to manage their condition (Shawahna et al., 2013).

Notably, education level emerges as a pivotal factor in fostering desirable health behaviors. A person's educational background significantly impacts their receptiveness to health-related information, thereby influencing their capacity to adopt healthier lifestyle choices to enhance their overall quality of life (Putra & Toonsiri, 2017). This effect extends beyond individual T2DM patients to encompass their familial and immediate environments. By cultivating a comprehensive understanding of health within the context of these environments, there is an opportunity to fortify support systems and promote better disease control among T2DM patients (Alavi et al., 2011).

5.6. Health Behaviour and Treatment Adherence among Patients with T2DM

The findings of this study reveal a notable and positive correlation between treatment adherence and health behaviors (rs= .406; p= .000), as depicted in Table 4-8. This direct correlation underscores that heightened engagement in health behaviors is associated with improved treatment adherence outcomes. For individuals with Type 2 Diabetes (T2DM), specific behaviors related to diabetes management, such as maintaining an organized lifestyle, exhibit a significant connection to treatment adherence. Notably, individuals within the poor adherence category have the potential to enhance their adherence to diabetes treatment through the cultivation of health behavior practices, particularly "living an orderly life" (Hashimoto et al., 2019).

The complex interplay of various factors influences health behaviors, subsequently influencing adherence or nonadherence to T2DM treatment protocols.

In a study by Farhat et al. (2019), the adherence of 207 patients to Oral Glucose Lowering Drugs (OGLD) was closely tied to their Quality of Life (QOL), treatment satisfaction, and perceived efficacy. Interestingly, female gender and higher QOL scores played pivotal roles in shaping positive perceptions and promoting adherence, outperforming their male counterparts or those with lower QOL scores. However, factors like perceptions of side effects, psychological impacts, and overall medication satisfaction significantly distorted the treatment process and management of T2DM. Kretchy et al. (2020) discovered that 66.5% of 188 patients exhibited poor medication adherence, with females comprising 72.3% of the cohort, and patients expressing concerns about physician care quality and social support. Consequently, individuals with inadequate medication adherence faced challenging social circumstances, feelings of isolation, anger, and disillusionment with their T2DM treatment.

Albargawi et al. (2016) proposed that fostering a robust sense of health locus of control, along with self-efficacy, could markedly enhance adherence to both oral drugs and insulin-based treatments. Their study of 30 Saudi T2DM patients underscored that health behavior improvements and tailored recommendations bolstered medication adherence, along with adherence to physical exercise, foot care, and specific dietary guidelines. While the generalizability of the Albargawi study might be limited, it highlights the potential of positive health behaviors in fostering adherence to oral medications and insulin, alongside encouraging self-care management practices.

The study's results indicate that respondents displayed poor health behaviors and low treatment adherence. Notably, a statistically significant association emerged between health behaviors and treatment adherence (p=.000). This study contributes valuable insights into the importance of health education across diverse demographics, aimed at enhancing treatment adherence for T2DM patients. Future

research endeavors should explore strategies for sustaining therapeutic adherence among patients to ultimately enhance their quality of life.

These findings align with similar research conducted in Indonesia and Saudi Arabia, which also identified a positive correlation between treatment adherence and health behaviors (Perwitasari et al., 2016; Ahmed et al., 2017). Furthermore, a study from India emphasized the pivotal role of disease awareness and patient education in elevating adherence levels (Mishra et al., 2021). In Pakistan, a study affirmed that non-adherence was more prevalent among the illiterate strata of the population, and health behavior significantly impacted medication adherence in T2DM patients (Majeed et al., 2021). These collective findings underscore the importance of disease education interventions by health regulatory agencies to bolster medication adherence in individuals with chronic conditions.

Chapter Six

Conclusions & Recommendations

Chapter Six

Conclusions and Recommendations

6.1. Conclusion:

In light of the results interpretations and its discussion, our study concludes that:

6.1.1. The results of the study showed that patients with type 2 diabetes expressed suboptimal adherence to treatment due to poor health behaviours.

6.1.2. The treatment adherence varies according to the age, gender, marital status, monthly income, duration of diabetes mellitus and its associated comorbidities.

6.1.3. The monthly income and education level are predicted variables in improving their diabetes health behaviours.

6.1.4. The adopting diabetes healthy behaviours is significant treatment adherence among patients with type 2 diabetes mellitus.

6.1.5. There is accept research hypothesis demonstrated that the health behaviours among type 2 diabetes mellitus are predicted their treatment adherence.

6.2. Recommendations:

In light of the conclusions reached by the study, the researcher recommends the following:

6.2.1. There is a need for health policies or initiatives that would improve newly diagnosed diabetic patients' adherence to treatment through media campaigns and rehabilitation facilities.

6.2.2. Health awareness programs may be extremely important in raising patient adherence rates. In order to increase patient adherence to T2DM therapy,

additional research is required to examine the effect of awareness campaigns on patient amnesia.

6.2.3. Encourage the patients with type 2 diabetes mellitus should own a glucometer at home for self-monitoring to get better control of their blood glucose level.

6.2.4. Keeping in mind the high prevalence of both diabetes and nonadherence to the treatment regimen, additional nurses should be trained to run special diabetic clinics at rates that patients can easily afford to pay.

6.2.5. A manual booklet of treatment adherence related diabetes mellitus it should be write in simple words and use attractive pictures given to the patients and family.

6.2.6. Draw attention to further studies is needed to explore strategies that adopting health behaviors among patients in order to improve their treatment adherence.

References

المصادر العربية:

القران الكريم , سورة البقرة, الآية (261).

References

Abate, T. W. (2019). Medication non-adherence and associated factors among diabetes patients in Felege Hiwot Referral Hospital, Bahir Dar city administration, Northwest Ethiopia. *BMC research notes*, *12*(1), 1-6.

Abebe, S. M., Berhane, Y., & Worku, A. (2014). Barriers to diabetes medication adherence in North West Ethiopia. *Springerplus*, *3*, 1-6.

Abusaib, M., Ahmed, M., Nwayyir, H. A., Alidrisi, H. A., Al-Abbood, M., Al-Bayati, A., ... & Mansour, A. (2020). Iraqi experts consensus on the management of type 2 diabetes/prediabetes in adults. *Clinical Medicine Insights: Endocrinology and Diabetes*, *13*, 1179551420942232.

Abusaib, M., Ahmed, M., Nwayyir, H. A., Alidrisi, H. A., Al-Abbood, M., Al-Bayati, A., ... & Mansour, A. (2020). Iraqi experts consensus on the management of type 2 diabetes/prediabetes in adults. *Clinical Medicine Insights: Endocrinology and Diabetes*, *13*, 1179551420942232.

Adhikari Baral, I., & Baral, S. (2021). Self-care management among patients with type 2 diabetes mellitus in Tanahun, Nepal. *Arch Community Med Public Health*, *7*(1), 03-042.

Afandi, B., Hassanein, M., Roubi, S., & Nagelkerke, N. (2019). The value of continuous glucose monitoring and self-monitoring of blood glucose in patients with gestational diabetes mellitus during Ramadan fasting. *Diabetes Research and Clinical Practice*, *151*, 260-264.

Afroz, A., Alam, K., Ali, L., Karim, A., Alramadan, M. J., Habib, S. H., ... & Billah, B. (2019). Type 2 diabetes mellitus in Bangladesh: a prevalence based cost-of-illness study. *BMC health services research*, *19*(1), 1-12.

Ahmed, N. O., Abugalambo, S., & Almethen, G. H. (2017). Adherence to oral hypoglycemic medication among patients with diabetes in Saudi Arabia. *International journal of health sciences*, *11*(3), 45.

Alam, S., Eqbal, K., Patel, I., Mulla, I., Ansari, S., & Ayesha, B. (2017). The history of diabetes: from olden days to discovering insulin. *International Journal of Unani and Integrative Medicine*, *1*(1), 25-28.

Alavi, N. M., Alami, L., Taefi, S., & Gharabagh, G. S. (2011). Factor analysis of self-treatment in diabetes mellitus: a cross-sectional study. *BMC public health*, *11*(1), 1-5.

Albargawi, M., Snethen, J., Gannass, A. A., & Kelber, S. (2016). Perception of persons with type 2 diabetes mellitus in Saudi Arabia. *International Journal of Nursing Sciences*, *3*(1), 39-44.

Alfian, S. D., Sukandar, H., Lestari, K., & Abdulah, R. (2016). Medication adherence contributes to an improved quality of life in type 2 diabetes mellitus patients: a cross-sectional study. *Diabetes Therapy*, *7*(4), 755-764.

Alhaiti, A. H., Senitan, M., Dator, W. L. T., Sankarapandian, C., Baghdadi, N. A., Jones, L. K., ... & Lenon, G. B. (2020). Adherence of type 2 diabetic patients to self-care activity: tertiary care setting in Saudi Arabia. *Journal of Diabetes Research*, *2020*.

Ali, M., Alemu, T., & Sada, O. (2017). Medication adherence and its associated factors among diabetic patients at Zewditu Memorial Hospital, Addis Ababa, Ethiopia. *BMC research notes*, *10*(1), 1-5.

Ali, N. S. M., Allela, O. Q., Salih, H. M., & Ahmed, I. H. (2019). Prevalence of Type 2 Diabetes Associated Complications in Kurdistan Region Iraq. *Journal of Basic and Clinical Pharmacy*, *10*(1).

Al-Mutawaa, K. A., Farghaly, A. H., Nasir, R., Loares, A. M., Skaroni, I., Al-Thani, M., & Abou-Samra, A. B. (2022). Level of knowledge, attitude and practice

towards diabetes among nationals and long-term residents of Qatar: a cross-sectional study. *BMJ open*, *12*(2), e052607.

Al-Salmi, N., Cook, P., & D'souza, M. S. (2022). Diet adherence among adults with type 2 diabetes mellitus: A concept analysis. *Oman Medical Journal*, *37*(2), e361.

Alvarado-Martel, D., Ruiz Fernández, M., Cuadrado Vigaray, M., Carrillo, A., Boronat, M., Expósito Montesdeoca, A., & Wägner, A. M. (2019). Identification of psychological factors associated with adherence to self-care behaviors amongst patients with type 1 diabetes. *Journal of Diabetes Research*, *2019*.

Aminde, L. N., Tindong, M., Ngwasiri, C. A., Aminde, J. A., Njim, T., Fondong, A. A., & Takah, N. F. (2019). Adherence to antidiabetic medication and factors associated with non-adherence among patients with type-2 diabetes mellitus in two regional hospitals in Cameroon. *BMC endocrine disorders*, *19*(1), 1-9.

Anwer, M. A., Al-Fahed, O. B., Arif, S. I., Amer, Y. S., Titi, M. A., & Al-Rukban, M. O. (2018). Quality assessment of recent evidence-based clinical practice guidelines for management of type 2 diabetes mellitus in adults using the AGREE II instrument. *Journal of evaluation in clinical practice*, *24*(1), 166-172.

Arulmozhi, S., & Mahalakshmy, T. (2014). Self care and medication adherence among type 2 diabetics in Puducherry, Southern India: A hospital based study. *Journal of clinical and diagnostic research: JCDR*, *8*(4), UC01.

Asril, N. M., Tabuchi, K., Tsunematsu, M., Kobayashi, T., & Kakehashi, M. (2020). Predicting healthy lifestyle behaviours among patients with type 2 diabetes in rural bali, Indonesia. *Clinical Medicine Insights: Endocrinology and Diabetes*, *13*, 1179551420915856.

Association, A. D. (2021). 1. Improving care and promoting health in populations: standards of medical care in diabetes—2021. *Diabetes Care*, *44*(Supplement_1), S7-S14.

Awodele, O., & Osuolale, J. A. (2015). Medication adherence in type 2 diabetes patients: study of patients in Alimosho General Hospital, Igando, Lagos, Nigeria. *African health sciences*, *15*(2), 513-522.

Ayele, A. A., Tegegn, H. G., Ayele, T. A., & Ayalew, M. B. (2019). Medication regimen complexity and its impact on medication adherence and glycemic control among patients with type 2 diabetes mellitus in an Ethiopian general hospital. *BMJ Open Diabetes Research and Care*, *7*(1), e000685.

Babaliche, P., Nadpara, R. A., & Maldar, A. (2019). Association between estimated glomerular filtration rate and microvascular complications in type II diabetes mellitus patients: a 1-year cross-sectional study. *Journal of the National Medical Association*, *111*(1), 83-87.

Babaniamansour, S., Aliniagerdroudbari, E., & Niroomand, M. (2020). Glycemic control and associated factors among Iranian population with type 2 diabetes mellitus: a cross-sectional study. *Journal of Diabetes & Metabolic Disorders*, *19*, 933-940.

Babenko, A. Y., Mosikian, A. A., Lebedev, D. L., Khrabrova, E. A., & Shlyakhto, E. V. (2019). Mental state, psychoemotional status, quality of life and treatment compliance in patients with Type 2 diabetes mellitus. *Journal of comparative effectiveness research*, *8*(2), 113-120.

Badi, S., Abdalla, A., Altayeb, L., Noma, M., & Ahmed, M. H. (2020). Adherence to antidiabetic medications among Sudanese individuals with type 2 diabetes mellitus: a cross-sectional survey. *Journal of Patient Experience*, *7*(2), 163-168.

Bagonza, J., Rutebemberwa, E., & Bazeyo, W. (2015). Adherence to anti diabetic medication among patients with diabetes in eastern Uganda; a cross sectional study. *BMC health services research*, *15*(1), 1-7.

Baum, C., Soliman, A. S., Brown, H. E., Seifeldin, I. A., Ramadan, M., Lott, B., ... & Hablas, A. (2020). Regional variation of pancreatic cancer incidence in the Nile Delta Region of Egypt over a twelve-year period. *Journal of Cancer Epidemiology*, *2020*.

Bédard, A., Lamarche, P. O., Grégoire, L. M., Trudel-Guy, C., Provencher, V., Desroches, S., & Lemieux, S. (2020). Can eating pleasure be a lever for healthy eating? A systematic scoping review of eating pleasure and its links with dietary behaviors and health. *PloS one*, *15*(12), e0244292.

Bermejo, S., García-Carro, C., & Soler, M. J. (2021). Diabetes and renal disease—should we biopsy?. *Nephrology Dialysis Transplantation*, *36*(8), 1384-1386.

Bermeo-Cabrera, J., Almeda-Valdes, P., Riofrios-Palacios, J., Aguilar-Salinas, C. A., & Mehta, R. (2018). Insulin adherence in type 2 diabetes in Mexico: behaviors and barriers. *Journal of diabetes research*, *2018*.

Birabwa, C., Bwambale, M. F., Waiswa, P., & Mayega, R. W. (2019). Quality and barriers of outpatient diabetes care in rural health facilities in Uganda–a mixed methods study. *BMC Health Services Research*, *19*(1), 1-10.

Bosworth, H. B., Fortmann, S. P., Kuntz, J., Zullig, L. L., Mendys, P., Safford, M., ... & Rumptz, M. H. (2017). Recommendations for providers on person-centered approaches to assess and improve medication adherence. *Journal of general internal medicine*, *32*(1), 93-100.

Boursier, J., Anty, R., Carette, C., Cariou, B., Castera, L., Caussy, C., ... & Petit, J. M. (2021). Management of diabetes mellitus in patients with cirrhosis: An overview and joint statement. *Diabetes & Metabolism*, *47*(5), 101272.

Burnier, M. (2017). Drug adherence in hypertension. *Pharmacological research*, *125*, 142-149.

Buss, V. H., Leesong, S., Barr, M., Varnfield, M., & Harris, M. (2020). Primary prevention of cardiovascular disease and type 2 diabetes mellitus using mobile health technology: systematic review of the literature. *Journal of medical Internet research*, *22*(10), e21159.

Chater, A. M., Smith, L., Ferrandino, L., Wyld, K., & Bailey, D. P. (2020). Health behaviour change considerations for weight loss and type 2 diabetes: nutrition, physical activity and sedentary behaviour. *Practical Diabetes*, *37*(6), 228-231b.

Cheng, L. J., Wang, W., Lim, S. T., & Wu, V. X. (2019). Factors associated with glycaemic control in patients with diabetes mellitus: a systematic literature review. *Journal of clinical nursing*, *28*(9-10), 1433-1450.

Chia, C. W., Egan, J. M., & Ferrucci, L. (2018). Age-related changes in glucose metabolism, hyperglycemia, and cardiovascular risk. *Circulation research*, *123*(7), 886-904.

Conner, M., & Norman, P. (2017). Health behaviour: Current issues and challenges. *Psychology & health*, *32*(8), 895-906.

Conner, M., McEachan, R., Jackson, C., McMillan, B., Woolridge, M., & Lawton, R. (2013). Moderating effect of socioeconomic status on the relationship between health cognitions and behaviors. *Annals of Behavioral Medicine*, *46*(1), 19-30.

Dávila-Cervantes, C. A., & Agudelo-Botero, M. (2019). Sex disparities in the epidemic of type 2 diabetes in Mexico: national and state level results based on the Global Burden of Disease Study, 1990–2017. *Diabetes, metabolic syndrome and obesity: targets and therapy*, *12*, 1023.

de Souza Moreira, B., Sampaio, R. F., Diz, J. B. M., de Carvalho Bastone, A., Ferriolli, E., Neri, A. L., ... & Kirkwood, R. N. (2017). Factors associated with

fear of falling in community-dwelling older adults with and without diabetes mellitus: findings from the Frailty in Brazilian Older People Study (FIBRA-BR). *Experimental gerontology*, *89*, 103-111.

Dedefo, M. G., Ejeta, B. M., Wakjira, G. B., Mekonen, G. F., & Labata, B. G. (2019). Self-care practices regarding diabetes among diabetic patients in West Ethiopia. *BMC research notes*, *12*(1), 1-7.

Degefa, G., Wubshet, K., Tesfaye, S., & Hirigo, A. T. (2020). Predictors of adherence toward specific domains of diabetic self-care among type-2 diabetes patients. *Clinical Medicine Insights: Endocrinology and Diabetes*, *13*, 1179551420981909.

Divya, S., & Nadig, P. (2015). Factors contributing to non-adherence to medication among type 2 diabetes mellitus in patients attending tertiary care hospital in South India. *Asian J Pharm Clin Res*, *8*(2), 274-276.

Drewelies, J., Wagner, J., Tesch-Römer, C., Heckhausen, J., & Gerstorf, D. (2017). Perceived control across the second half of life: The role of physical health and social integration. *Psychology and Aging*, *32*(1), 76.

Elsous, A., Radwan, M., Al-Sharif, H., & Abu Mustafa, A. (2017). Medications adherence and associated factors among patients with type 2 diabetes mellitus in the Gaza Strip, Palestine. *Frontiers in endocrinology*, *8*, 100.

Epstein, N. E. (2017). More risks and complications for elective spine surgery in morbidly obese patients. *Surgical Neurology International*, *8*.

Fadare, J., Moshomo, T., Godman, B., Meyer, J. C., Gollakota, S., Gaenamong, M., ... & Rwegerera, G. M. (2017). Antidiabetic medication adherence and associated factors among patients in Botswana; implications for the future.

Farhat, R., Assaf, J., Jabbour, H., Licha, H., Hajj, A., Hallit, S., & Khabbaz, L. R. (2019). Adherence to oral glucose lowering drugs, quality of life, treatment

satisfaction and illness perception: A cross-sectional study in patients with type 2 diabetes. *Saudi pharmaceutical journal*, *27*(1), 126-132.

Faselis, C., Katsimardou, A., Imprialos, K., Deligkaris, P., Kallistratos, M., & Dimitriadis, K. (2020). Microvascular complications of type 2 diabetes mellitus. *Current vascular pharmacology*, *18*(2), 117-124.

Feizollahzadeh, S., Ghiasvand, R., Rezaei, A., Khanahmad, H., & Hariri, M. (2017). Effect of probiotic soy milk on serum levels of adiponectin, inflammatory mediators, lipid profile, and fasting blood glucose among patients with type II diabetes mellitus. *Probiotics and antimicrobial proteins*, *9*(1), 41-47.

Fénichel, P., & Chevalier, N. (2017). Environmental endocrine disruptors: New diabetogens?. *Comptes Rendus Biologies*, *340*(9-10), 446-452.

Flannick, J., Mercader, J. M., Fuchsberger, C., Udler, M. S., Mahajan, A., Wessel, J., ... & Abecasis, G. (2019). Exome sequencing of 20,791 cases of type 2 diabetes and 24,440 controls. *Nature*, *570*(7759), 71-76.

Forte, R., Haulani, H., & Jürgens, I. (2020). Quantitative and qualitative analysis of the three capillary plexuses and choriocapillaris in patients with type 1 and type 2 diabetes mellitus without clinical signs of diabetic retinopathy: a prospective pilot study. *Retina*, *40*(2), 333-344.

Gabler, M., Picker, N., Geier, S., Ley, L., Aberle, J., Lehrke, M., ... & Wilke, T. (2021). Guideline adherence and associated outcomes in the treatment of type 2 diabetes mellitus patients with an incident cardiovascular comorbidity: an analysis based on a large German claims dataset. *Diabetes Therapy*, *12*, 1209-1226.

Gastaldi, G., Goossens, N., Clément, S., & Negro, F. (2017). Current level of evidence on causal association between hepatitis C virus and type 2 diabetes: a review. *Journal of advanced research*, *8*(2), 149-159.

Gholamaliei, B., Karimi-Shahanjarini, A., Roshanaei, G., & Rezapour-Shahkolaei, F. (2016). Medication adherence and its related factors in patients with type II diabetes. *Journal of Education and Community Health*, *2*(4), 3-12.

Hackett, R. A., Moore, C., Steptoe, A., & Lassale, C. (2018). Health behaviour changes after type 2 diabetes diagnosis: Findings from the English Longitudinal Study of Ageing. *Scientific reports*, *8*(1), 1-8.

Hailu, F. B., Hjortdahl, P., & Moen, A. (2021). Effect of locally-contextualized nurse-led diabetes self-management education on psychosocial health and quality of life: A controlled before-after study. *International Journal of Africa Nursing Sciences*, *15*, 100325.

Hashimoto, K., Urata, K., Yoshida, A., Horiuchi, R., Yamaaki, N., Yagi, K., & Arai, K. (2019). The relationship between patients' perception of type 2 diabetes and medication adherence: a cross-sectional study in Japan. *Journal of pharmaceutical health care and sciences*, *5*(1), 1-10.

Heissam, K., Abuamer, Z., & El-Dahshan, N. (2015). Patterns and obstacles to oral antidiabetic medications adherence among type 2 diabetics in Ismailia, Egypt: a cross section study. *The Pan African Medical Journal*, *20*(177).

Ho, S. C., Chong, H. Y., Chaiyakunapruk, N., Tangiisuran, B., & Jacob, S. A. (2016). Clinical and economic impact of non-adherence to antidepressants in major depressive disorder: a systematic review. *Journal of affective disorders*, *193*, 1-10.

Huang, J., Ding, S., Xiong, S., & Liu, Z. (2021). Medication adherence and associated factors in patients with type 2 diabetes: A structural equation model. *Frontiers in public health*, 1647.

Hussain, N., Said, A. S., & Khan, Z. (2020). Influence of health literacy on medication adherence among elderly females with type 2 diabetes in

Pakistan. *International Quarterly of Community Health Education*, *41*(1), 35-44.

International Diabetes Federation. Diabetes facts & figures. 2020 [cited 12 February 2020]. In: International Diabetes Federation. Available from: https://www.idf.org/aboutdiabetes/what-is-diabetes/facts-figures.html

International Diabetes Federation. IDF Diabetes Atlas, 7th edn. Brussels, Belgium: International Diabetes Federation, 2015. *Eur Respir J*, *27*, 188-207. http://ww.idf.org/diabetesatlas/5e/the-global-burden

Islam, S. M. S., Salehin, M., Zaman, S. B., Tansi, T., Gupta, R. D., Barua, L., ... & Uddin, R. (2021). Factors associated with chronic kidney disease in patients with type 2 diabetes in Bangladesh. *International Journal of Environmental Research and Public Health*, *18*(23), 12277.

Jannoo, Z., Wah, Y. B., Lazim, A. M., & Hassali, M. A. (2017). Examining diabetes distress, medication adherence, diabetes self-care activities, diabetes-specific quality of life and health-related quality of life among type 2 diabetes mellitus patients. *Journal of clinical & translational endocrinology*, *9*, 48-54.

Jayawardena, R., Ranasinghe, P., Chathuranga, T., Atapattu, P. M., & Misra, A. (2018). The benefits of yoga practice compared to physical exercise in the management of type 2 Diabetes Mellitus: A systematic review and meta-analysis. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, *12*(5), 795-805.

Jayaweera, K., Aschan, L., Pannala, G., Adikari, A., Glozier, N., Ismail, K., ... & Hotopf, M. (2018). The Colombo Twin and Singleton Follow-up Study: a population based twin study of psychiatric disorders and metabolic syndrome in Sri Lanka. *BMC Public Health*, *18*(1), 1-15.

Jayedi, A., Emadi, A., & Shab-Bidar, S. (2022). Dose-Dependent Effect of Supervised Aerobic Exercise on HbA1c in Patients with Type 2 Diabetes: A Meta-analysis of Randomized Controlled Trials. *Sports Medicine*, 1-20.

Jenssen, T., & Hartmann, A. (2019). Post-transplant diabetes mellitus in patients with solid organ transplants. *Nature Reviews Endocrinology*, *15*(3), 172-188.

Jin, H., Kim, Y., & Rhie, S. J. (2016). Factors affecting medication adherence in elderly people. *Patient preference and adherence*, *10*, 2117.

Juma Elywy, G., Radhi, M. M., & Khyoosh Al-Eqabi, Q. A. (2022). Social Support and Its Association With the Quality of Life (QoL) of Amputees. *Iranian Rehabilitation Journal*, *20*(2), 253-260.

Khalifa, M. F. (2022). Impact of Psychological Distress in Women upon Coping with Breast Cancer. *Iraqi National Journal of Nursing Specialties*, *35*(1).

Khan, I. I., Pulock, O. S., Pinky, S. D., Barua, B., Dola, T. A., Chowdhury, P., ... & Siddiqui, S. R. A. (2022). Treatment noncompliance level among patients with type 2 diabetes mellitus: A hospital based cross-sectional study in Bangladesh. *Plos one*, *17*(9), e0271107.

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.

Khera, R., Valero-Elizondo, J., Das, S. R., Virani, S. S., Kash, B. A., De Lemos, J. A., ... & Nasir, K. (2019). Cost-related medication nonadherence in adults with atherosclerotic cardiovascular disease in the United States, 2013 to 2017. *Circulation*, *140*(25), 2067-2075.

Khudhair, S. S., & Ahmed, S. A. (2022). Type 2 Diabetic Patients' Knowledge Regarding Preventive Measures of Diabetic Foot. *Iraqi National Journal of Nursing Specialties*, *35*(2).

Kim, N. H., Look, K. A., Dague, L., & Winn, A. N. (2022). Financial burden and medication adherence among near-poor older adults in a pharmaceutical assistance program. *Research in Social and Administrative Pharmacy*, *18*(3), 2517-2523.

Kirkman, M. S., Rowan-Martin, M. T., Levin, R., Fonseca, V. A., Schmittdiel, J. A., Herman, W. H., & Aubert, R. E. (2015). Determinants of adherence to diabetes medications: findings from a large pharmacy claims database. *Diabetes care*, *38*(4), 604-609.

Knudsen, J. S., Knudsen, S. S., Hulman, A., Witte, D. R., Gregg, E. W., Lauritzen, T., ... & Thomsen, R. W. (2022). Changes in type 2 diabetes incidence and mortality associated with introduction of HbA1c as diagnostic option: A Danish 24-year population-based study. *The Lancet Regional Health-Europe*, *14*, 100291.

Koc, A. S., & Sumbul, H. E. (2018). Increased aortic intima-media thickness may be used to detect macrovascular complications in adult type II diabetes mellitus patients. *Cardiovascular Ultrasound*, *16*(1), 1-7.

Koech, C. K. (2020). *FACTORS AFFECTING TREATMENT COMPLIANCE AMONG TYPE 2 DIABETES PATIENTS ON FOLLOW-UP AT MOI TEACHING AND REFERRAL HOSPITAL* (Doctoral dissertation, MMUST).

Kooshyar, H., Shoorvazi, M., Dalir, Z., & Hosseini, M. (2013). Health literacy and its relationship with medical adherence and health-related quality of life in diabetic community-residing elderly. *Journal of Mazandaran University of Medical Sciences*, *22*(1), 134-143.

Kopitar, L., Kocbek, P., Cilar, L., Sheikh, A., & Stiglic, G. (2020). Early detection of type 2 diabetes mellitus using machine learning-based prediction models. *Scientific reports*, *10*(1), 1-12.

Kretchy, I. A., Koduah, A., Ohene-Agyei, T., Boima, V., & Appiah, B. (2020). The association between diabetes-related distress and medication adherence in adult patients with type 2 diabetes mellitus: a cross-sectional study. *Journal of diabetes research*, *2020*.

Kubica, A., Kosobucka, A., Michalski, P., Fabiszak, T., & Felsmann, M. (2017). Self-reported questionnaires for assessment adherence to treatment in patients with cardiovascular diseases. *Medical Research Journal*, *2*(4), 115-122.

Kvarnström, K., Westerholm, A., Airaksinen, M., & Liira, H. (2021). Factors contributing to medication adherence in patients with a chronic condition: a scoping review of qualitative research. *Pharmaceutics*, *13*(7), 1100.

Lambrinou, E., Hansen, T. B., & Beulens, J. W. (2019). Lifestyle factors, self-management and patient empowerment in diabetes care. *European journal of preventive cardiology*, *26*(2_suppl), 55-63.

Laranjo, L., Neves, A. L., Costa, A., Ribeiro, R. T., Couto, L., & Sá, A. B. (2015). Facilitators, barriers and expectations in the self-management of type 2 diabetes—a qualitative study from Portugal. *European Journal of General Practice*, *21*(2), 103-110.

Lee, C. S., Tan, J. H. M., Sankari, U., Koh, Y. L. E., & Tan, N. C. (2017). Assessing oral medication adherence among patients with type 2 diabetes mellitus treated with polytherapy in a developed Asian community: a cross-sectional study. *BMJ open*, *7*(9), e016317.

Lee, M. K., Han, K., Kim, M. K., Koh, E. S., Kim, E. S., Nam, G. E., ... & Kwon, H. S. (2020). Combinations of metabolic syndrome components and the risk of type

2 diabetes mellitus: A nationwide cohort study. *Diabetes Research and Clinical Practice*, *165*, 108237.

Leventhal, H., Nerenz, D. R., & Steele, D. J. (2020). Illness representations and coping with health threats. In *Handbook of Psychology and Health (Volume IV)* (pp. 219-252). Routledge.

Lin, L. K., Sun, Y., Heng, B. H., Chew, D. E. K., & Chong, P. N. (2017). Medication adherence and glycemic control among newly diagnosed diabetes patients. *BMJ Open Diabetes Research and Care*, *5*(1), e000429.

Lin, T., Gubitosi-Klug, R. A., Channa, R., & Wolf, R. M. (2021). Pediatric Diabetic Retinopathy: Updates in Prevalence, Risk Factors, Screening, and Management. *Current diabetes reports*, *21*(12), 1-11.

Lockton, D. (2012). Simon's scissors and ecological psychology in design for behaviour change. *Available at SSRN 2125405*.

Lundy, F. L., Suryani, P., & Akbar, P. S. (2020). Educational Model for Cadres and Housewives Against Changes in Family Knowledge and Behavior in Efforts to Prevent Complications of Type II DM in Bunut Wetan Village, Malang Regency. *Health Notions*, *4*(12), 419-424.

Majeed, A., Rehman, M., Hussain, I., Imran, I., Saleem, M. U., Saeed, H., ... & Rasool, M. F. (2021). The impact of treatment adherence on quality of life among type 2 diabetes mellitus patients–Findings from a cross-sectional study. *Patient preference and adherence*, 475-481.

Mannan, A., Hasan, M. M., Akter, F., Rana, M. M., Chowdhury, N. A., Rawal, L. B., & Biswas, T. (2021). Factors associated with low adherence to medication among patients with type 2 diabetes at different healthcare facilities in southern Bangladesh. *Global health action*, *14*(1), 1872895.

Manne-Goehler, J., Atun, R., Stokes, A., Goehler, A., Houinato, D., Houehanou, C., ... & Bärnighausen, T. (2016). Diabetes diagnosis and care in sub-Saharan

Africa: pooled analysis of individual data from 12 countries. *The lancet Diabetes & endocrinology*, *4*(11), 903-912.

Martín-Timón, I., Sevillano-Collantes, C., Segura-Galindo, A., & del Cañizo-Gómez, F. J. (2014). Type 2 diabetes and cardiovascular disease: have all risk factors the same strength?. *World journal of diabetes*, *5*(4), 444.

Masaba, B. B., & Mmusi-Phetoe, R. M. (2020). Determinants of non-adherence to treatment among patients with type 2 diabetes in Kenya: a systematic review. *Journal of Multidisciplinary Healthcare*, *13*, 2069.

McKenzie, A. L., Athinarayanan, S. J., McCue, J. J., Adams, R. N., Keyes, M., McCarter, J. P., ... & Hallberg, S. J. (2021). Type 2 diabetes prevention focused on normalization of glycemia: a two-year pilot study. *Nutrients*, *13*(3), 749.

Mehrtak, M., Hemmati, A., & Bakhshzadeh, A. (2018). Health Literacy and its Relationship with the medical, dietary Adherence and exercise in Patients with Type II Diabetes mellitus. *Journal of Health Literacy*, *3*(2), 137-144.

Mesfin, Y., Assegid, S., & Beshir, M. (2017). Medication adherence among type 2 diabetes ambulatory patients in Zewditu Memorial Hospital, Addis Ababa, Ethiopia. *Epidemiology (Sunnyvale)*, *7*(5), 1-12.

Mikhael, E. M., Hassali, M. A., Hussain, S. A., & Shawky, N. (2018). Self-management knowledge and practice of type 2 diabetes mellitus patients in Baghdad, Iraq: a qualitative study. *Diabetes, metabolic syndrome and obesity: targets and therapy*, 1-17.

Mishra, R., Chesi, A., Cousminer, D. L., Hawa, M. I., Bradfield, J. P., Hodge, K. M., ... & Grant, S. F. (2017). Relative contribution of type 1 and type 2 diabetes loci to the genetic etiology of adult-onset, non-insulin-requiring autoimmune diabetes. *BMC medicine*, *15*(1), 1-10.

Mishra, R., Sharma, S. K., Verma, R., Kangra, P., Dahiya, P., Kumari, P., ... & Kant, R. (2021). Medication adherence and quality of life among type-2 diabetes mellitus patients in India. *World Journal of Diabetes*, *12*(10), 1740.

Misra, B. B., & Misra, A. (2020). The chemical exposome of type 2 diabetes mellitus: Opportunities and challenges in the omics era. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, *14*(1), 23-38.

Mohamdy, O. (2020). Barriers to Health Behavior Change in People with Type 2 Diabetes: Survey Study. *medRxiv*.

Mohammed, M. Y., & Abdulwahed, H. S. (2021). Assessment of Health Follow up and Weight Control for Women with Osteoporosis in Baqubah City. *Iraqi National Journal of Nursing Specialties*, *34*(2), 89-98.

Morgan SG, Lee A. Cost-related non-adherence to prescribed medicines among older adults: a cross-sectional analysis of a survey in 11 developed countries. BMJ open. 2017 Jan 1;7(1):e014287.

Morgan, T. L., Semenchuk, B. N., Ceccarelli, L., Kullman, S. M., Neilson, C. J., Kehler, D. S., ... & Strachan, S. M. (2020). Self-compassion, adaptive reactions and health behaviours among adults with prediabetes and type 1, type 2 and gestational diabetes: a scoping review. *Canadian Journal of Diabetes*, *44*(6), 555-565.

Mugo, I. M. (2018). Compliance to Recommended Dietary Practices Among Patients with Type 2 Diabetes Mellitus Attending Selected Hospitals in Nakuru County. *Kenyatta Univ*.

Mukona, D., Munjanja, S. P., Zvinavashe, M., & Stray-Pederson, B. (2017). Barriers of adherence and possible solutions to nonadherence to antidiabetic therapy in women with diabetes in pregnancy: patients' perspective. *Journal of diabetes research*, *2017*.

Murwanashyaka, J. D. D., Ndagijimana, A., Biracyaza, E., Sunday, F. X., & Umugwaneza, M. (2022). Non-adherence to medication and associated factors among type 2 diabetes patients at Clinique Medicale Fraternite, Rwanda: a cross-sectional study. *BMC Endocrine Disorders*, *22*(1), 1-14.

Nejat, N., Khan Mohamadi Hezave, A., Aghae Pour, S. M., Rezaei, K., Moslemi, A., & Mehrabi, F. (2021). Self-care and related factors in patients with type II diabetes in Iran. *Journal of Diabetes & Metabolic Disorders*, *20*(1), 635-639.

Nelson, L. A., Wallston, K. A., Kripalani, S., LeStourgeon, L. M., Williamson, S. E., & Mayberry, L. S. (2018). Assessing barriers to diabetes medication adherence using the Information-Motivation-Behavioral skills model. *Diabetes Research and Clinical Practice*, *142*, 374-384.

Nguyen, V. B., Thi, K. H. P., Nguyen, T. X., Pham, N. T. L., Nguyen, V. V. H., & Van Le, C. (2022). Diabetes self-management and its associated factors among patients with diabetes in central Vietnam: A cross-sectional study. *Plos one*, *17*(7), e0270901.

Okur, M. E., Karantas, I. D., & Siafaka, P. I. (2017). Diabetes mellitus: A review on pathophysiology, current status of oral medications and future perspectives.

Onge, E. S., Miller, S. A., Motycka, C., & DeBerry, A. (2015). A review of the treatment of type 2 diabetes in children. *The Journal of Pediatric Pharmacology and Therapeutics*, *20*(1), 4-16.

Othman, M. M., Al-Wattary, N. A., Khudadad, H., Dughmosh, R., Furuya-Kanamori, L., Doi, S. A., & Daher-Nashif, S. (2022). Perspectives of persons with type 2 diabetes toward diabetes self-management: A qualitative study. *Health Education & Behavior*, *49*(4), 680-688.

Oyewande, A. A., Iqbal, B., Abdalla, L. F., Karim, F., & Khan, S. (2020). An overview of the pathophysiology of metabolic changes and their sequence of occurrence in obese diabetic females: a narrative review. *Cureus*, *12*(10).

Park, C. L., Waddington, E., & Abraham, R. (2018). Different dimensions of religiousness/spirituality are associated with health behaviors in breast cancer survivors. *Psycho-Oncology*, *27*(10), 2466-2472.

Patel, S., Abreu, M., Tumyan, A., Adams-Huet, B., Li, X., & Lingvay, I. (2019). Effect of medication adherence on clinical outcomes in type 2 diabetes: analysis of the SIMPLE study. *BMJ Open Diabetes Research and Care*, *7*(1), e000761.

Pati, S., & Schellevis, F. G. (2017). Prevalence and pattern of co morbidity among type2 diabetics attending urban primary healthcare centers at Bhubaneswar (India). *PloS one*, *12*(8), e0181661.

Perwitasari, D. A., & Urbayatun, S. J. S. O. (2016). Treatment adherence and quality of life in diabetes mellitus patients in Indonesia. *Sage Open*, *6*(2), 2158244016643748.

Pivari, F., Mingione, A., Brasacchio, C., & Soldati, L. (2019). Curcumin and type 2 diabetes mellitus: prevention and treatment. *Nutrients*, *11*(8), 1837.

Polonsky, W. H., & Henry, R. R. (2016). Poor medication adherence in type 2 diabetes: recognizing the scope of the problem and its key contributors. *Patient preference and adherence*, *10*, 1299.

Pourhabibi, N., Mohebbi, B., Sadeghi, R., Shakibazadeh, E., Sanjari, M., Tol, A., & Yaseri, M. (2022). Factors associated with treatment adherence to treatment among in patients with type 2 diabetes in Iran: A cross-sectional study. *Frontiers in Public Health*, *10*.

Prajapati, V. B., Blake, R., Acharya, L. D., & Seshadri, S. (2018). Assessment of quality of life in type II diabetic patients using the modified diabetes quality of life (MDQoL)-17 questionnaire. *Brazilian Journal of Pharmaceutical Sciences*, *53*.

Prasad, R. B., & Groop, L. (2019). Precision medicine in type 2 diabetes. *Journal of internal medicine*, *285*(1), 40-48.

Putra, K. W. R., & Toonsiri, C. (2017). Factors Influencing Health Behavior Among Type 2 Diabetes Mellitus Patients: An Integrative Review. *Belitung Nursing Journal*, *3*(1), 32-40.

Qassim, W. J., Yasir, A. A., & Radhi, M. M. (2018). Assessment of Self Hardness and its Relationship to Treatment Acceptance for Patients with Diabetes Mellitus at Diabetic Center in Hilla City/Iraq. *Journal of Pharmaceutical Sciences and Research*, *10*(1), 142-145.

Qi, J., He, P., Yao, H., Song, R., Ma, C., Cao, M., ... & Ning, G. (2019). Cancer risk among patients with type 2 diabetes: A real-world study in Shanghai, China. *Journal of diabetes*, *11*(11), 878-883.

Rana, M. M., Islam, M. S., Akter, J., & Khatun, S. (2019). Medication Adherence to type 2 diabetic patients hospitalized at a tertiary care hospital in bangladesh: Diabetic medication adherence. *Journal of Health Sciences*, *9*(3), 159-167.

Ranjbaran, S., Shojaeizadeh, D., Dehdari, T., Yaseri, M., & Shakibazadeh, E. (2020). Determinants of medication adherence among Iranian patients with type 2 diabetes: An application of health action process approach. *Heliyon*, *6*(7), e04442.

Rashidy, M., & Karkehabadi, S. (2021). Aerobic exercise ameliorates glycemic control by improving the beta cell function and independent of insulin resistance in diabetic rats. *Pathobiology Research*, *24*(1), 11-18.

Reed, J., Bain, S., & Kanamarlapudi, V. (2021). A review of current trends with type 2 diabetes epidemiology, aetiology, pathogenesis, treatments and future perspectives. *Diabetes, metabolic syndrome and obesity: targets and therapy*, *14*, 3567.

Reisi, M., Fazeli, H., & Mahmoodi, M. (2021). Application of the social cognitive theory to predict self-care behavior among type 2 diabetes patients with limited health literacy. *Journal of health litaracy*, *6*(2), 21-32.

Renzi, C., Kaushal, A., Emery, J., Hamilton, W., Neal, R. D., Rachet, B., ... & Lyratzopoulos, G. (2019). Comorbid chronic diseases and cancer diagnosis: disease-specific effects and underlying mechanisms. *Nature reviews clinical oncology*, *16*(12), 746-761.

Rezaei, M., Valiee, S., Tahan, M., Ebtekar, F., & Ghanei Gheshlagh, R. (2019). Barriers of medication adherence in patients with type-2 diabetes: a pilot qualitative study. *Diabetes, metabolic syndrome and obesity: targets and therapy*, 589-599.

Rokicka, D., Wróbel, M., Szymborska-Kajanek, A., Bożek, A., & Strojek, K. (2018). Assessment of compliance to self monitoring of blood glucose in type 2 diabetic patients and level of implementation of Polish Diabetes Association Recommendation for general practitioners. *Clinical Diabetology*, *7*(3), 129-135.

Rørholm Pedersen, L., Frestad, D., Mide Michelsen, M., Dam Mygind, N., Rasmusen, H., Elena Suhrs, H., & Prescott, E. (2016). Risk factors for myocardial infarction in women and men: a review of the current literature. *Current pharmaceutical design*, *22*(25), 3835-3852.

Rosiek, A., Kornatowski, T., Frąckowiak-Maciejewska, N., Rosiek-Kryszewska, A., Wyżgowski, P., & Leksowski, K. (2016). Health behaviors of patients diagnosed with type 2 diabetes mellitus and their influence on the patients' satisfaction with life. *Therapeutics and clinical risk management*, *12*, 1783.

Rwegerera, G. M. (2014). Adherence to anti-diabetic drugs among patients with Type 2 diabetes mellitus at Muhimbili National Hospital, Dar es Salaam, Tanzania-A cross-sectional study. *The Pan African Medical Journal*, *17*.

Saeedi, P., Petersohn, I., Salpea, P., Malanda, B., Karuranga, S., Unwin, N., ... & IDF Diabetes Atlas Committee. (2019). Global and regional diabetes prevalence estimates for 2019 and projections for 2030 and 2045: Results from the

International Diabetes Federation Diabetes Atlas. *Diabetes research and clinical practice*, *157*, 107843.

Saleh, F., Ara, F., Mumu, S. J., & Hafez, M. A. (2015). Assessment of health-related quality of life of Bangladeshi patients with type 2 diabetes using the EQ-5D: a cross-sectional study. *BMC research notes*, *8*, 1-8.

Sami, W., Ansari, T., Butt, N. S., & Ab Hamid, M. R. (2017). Effect of diet on type 2 diabetes mellitus: A review. *International journal of health sciences*, *11*(2), 65.

Sankar, P., Ahmed, W. N., Koshy, V. M., Jacob, R., & Sasidharan, S. (2020). Effects of COVID-19 lockdown on type 2 diabetes, lifestyle and psychosocial health: a hospital-based cross-sectional survey from South India. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, *14*(6), 1815-1819.

Schraube, E., & Osterkamp, U. (2013). Basic concepts of critical psychology. In *Psychology from the Standpoint of the Subject* (pp. 19-27). Palgrave Macmillan, London.

Schunk, D. H., & Usher, E. L. (2012). Social cognitive theory and motivation. *The Oxford handbook of human motivation*, *2*, 11-26.

Sendekie, A. K., Netere, A. K., Kasahun, A. E., & Belachew, E. A. (2022). Medication adherence and its impact on glycemic control in type 2 diabetes mellitus patients with comorbidity: A multicenter cross-sectional study in Northwest Ethiopia. *PloS one*, *17*(9), e0274971.

Shams, N., Amjad, S., Ahmed, W., & Saleem, F. (2016). Drug non-adherence in type 2 diabetes mellitus; predictors and associations. *Journal of Ayub Medical College Abbottabad*, *28*(2), 302-307.

Shawahna, R., Ahmad, M., Debray, M., Declèves, X., Yliperttula, M., & Blom, M. (2012). Prescribers' perspectives of the socioeconomic status and important

indicators affecting prescribing behavior in a developing country. *Open Medicine*, *7*(1), 129-136.

Shayo, F. K., & Shayo, S. C. (2019). Availability and readiness of diabetes health facilities to manage tuberculosis in Tanzania: a path towards integrating tuberculosis-diabetes services in a high burden setting?. *BMC public health*, *19*(1), 1-7.

Sheir, R. E. S., Salem, M. N., Mamdouh, M., & AbdelKarem, R. M. (2020). The Relation between Microvascular Complications of Type II Diabetes with Levels of Serum Progranulin. *Egyptian Journal of Medical Research*, *1*(1), 29-42.

Shrestha, A. D., Kosalram, K., & Gopichandran, V. (2013). Gender difference in care of type 2 diabetes. *Journal of the Nepal Medical Association*, *52*(189).

Sia, H. K., Kor, C. T., Tu, S. T., Liao, P. Y., & Wang, J. Y. (2021). Self-monitoring of blood glucose in association with glycemic control in newly diagnosed non-insulin-treated diabetes patients: a retrospective cohort study. *Scientific Reports*, *11*(1), 1-9.

Simeni Njonnou, S. R., Boombhi, J., Etoa Etoga, M. C., Tiodoung Timnou, A., Jingi, A. M., Nkem Efon, K., ... & Sobngwi, E. (2020). Prevalence of diabetes and associated risk factors among a group of prisoners in the Yaoundé central prison. *Journal of diabetes research*, *2020*.

Singh, K., Kondal, D., Mohan, S., Jaganathan, S., Deepa, M., Venkateshmurthy, N. S., ... & Eggleston, K. (2021). Health, psychosocial, and economic impacts of the COVID-19 pandemic on people with chronic conditions in India: a mixed methods study. *BMC public health*, *21*(1), 1-15.

Skyler, J. S., Bakris, G. L., Bonifacio, E., Darsow, T., Eckel, R. H., Groop, L., ... & Ratner, R. E. (2017). Differentiation of diabetes by pathophysiology, natural history, and prognosis. *Diabetes*, *66*(2), 241-255.

Soliman, A., Nair, A. P., Al Masalamani, M. S., De Sanctis, V., Khattab, M. A. A., Alsaud, A. E., ... & Yassin, M. (2020). Prevalence, clinical manifestations, and biochemical data of type 2 diabetes mellitus versus nondiabetic symptomatic patients with COVID-19: A comparative study. *Acta Bio Medica: Atenei Parmensis*, *91*(3), e2020010.

Sorato, M. M., Tesfahun, C., & Lamessa, D. (2016). Levels and predictors of adherence to self-care behaviour among adult type 2 diabetics at Arba Minch general hospital, Southern Ethiopia. *J Diabetes Metab*, *7*(6), 11.

Sözen, T., Başaran, N. Ç., Tınazlı, M., & Özışık, L. (2018). Musculoskeletal problems in diabetes mellitus. *European journal of rheumatology*, *5*(4), 258.

Stanhope, K. L., Goran, M. I., Bosy-Westphal, A., King, J. C., Schmidt, L. A., Schwarz, J. M., ... & Krauss, R. M. (2018). Pathways and mechanisms linking dietary components to cardiometabolic disease: thinking beyond calories. *Obesity reviews*, *19*(9), 1205-1235.

Stevens, J. W., Khunti, K., Harvey, R., Johnson, M., Preston, L., Woods, H. B., ... & Goyder, E. (2015). Preventing the progression to type 2 diabetes mellitus in adults at high risk: a systematic review and network meta-analysis of lifestyle, pharmacological and surgical interventions. *Diabetes research and clinical practice*, *107*(3), 320-331.

Suceveanu, A. I., Stoian, A. P., Parepa, I., Voinea, C., Hainarosie, R., Manuc, D., ... & Suceveanu, A. P. (2018). Gut microbiota patterns in obese and type 2 diabetes (T2D) patients from romanian black sea coast region. *Rev Chim*, *69*(8), 2260-2267.

Sugave Ramling, V., Nagoba Shivappa, N., Ningule Ganesh, M., & Patil Pooja, Y. (2019). Review on Management Prevention and Treatment of Diabetes Mellitus. *Asian Journal of Pharmaceutical Research and Development*, *7*(2), 56-62.

Sun, H., Saeedi, P., Karuranga, S., Pinkepank, M., Ogurtsova, K., Duncan, B. B., ... & Magliano, D. J. (2022). IDF Diabetes Atlas: Global, regional and country-level diabetes prevalence estimates for 2021 and projections for 2045. *Diabetes research and clinical practice*, *183*, 109119.

Świątoniowska-Lonc, N., Tański, W., Polański, J., Jankowska-Polańska, B., & Mazur, G. (2021). Psychosocial Determinants of Treatment Adherence in Patients with Type 2 Diabetes–A Review. *Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy*, *14*, 2701.

Tassew, B. (2015). *Assessment of Diabetes Self-Care Practice and its Associated Factors among Patient on Follow Up at Public and Private Primary Level Health Care in Addis Ababa, Ethiopia* (Doctoral dissertation, Addis Ababa University).

Taylor, R., Al-Mrabeh, A., & Sattar, N. (2019). Understanding the mechanisms of reversal of type 2 diabetes. *The lancet Diabetes & endocrinology*, *7*(9), 726-736.

Thapar, R., Holla, R., Kumar, N., Aithal, S., Karkera, S., Rao, C., ... & Kumar, A. (2020). Factors influencing adherence to anti-diabetes medications among type 2 diabetes patients attending tertiary care hospitals in Mangaluru. *Clinical Epidemiology and Global Health*, *8*(4), 1089-1093.

Thojampa, S., & Sarnkhaowkhom, C. (2019). The social cognitive theory with diabetes: Discussion. *International Journal of Caring Sciences*, *12*(2), 1251.

Tran, B. X., Nguyen, L. H., Pham, N. M., Vu, H. T. T., Nguyen, H. T., Phan, D. H., ... & Ho, R. C. (2020). Global mapping of interventions to improve quality of life of people with diabetes in 1990–2018. *International journal of environmental research and public health*, *17*(5), 1597.

Trout, K. K., McCool, W. F., & Homko, C. J. (2019). Person-Centered Primary Care and Type 2 Diabetes: Beyond Blood Glucose Control. *Journal of Midwifery & Women's Health*, *64*(3), 312-323.

Ueno, H., Yamazaki, Y., Yonekura, Y., Park, M. J., Ishikawa, H., & Kiuchi, T. (2018). Reliability and validity of a 12-item medication adherence scale for patients with chronic disease in Japan. *BMC health services research*, *18*, 1-9.

Uusitupa, M., Khan, T. A., Viguiliouk, E., Kahleova, H., Rivellese, A. A., Hermansen, K., ... & Sievenpiper, J. L. (2019). Prevention of type 2 diabetes by lifestyle changes: a systematic review and meta-analysis. *Nutrients*, *11*(11), 2611.

Van Cappellen, P., Rice, E. L., Catalino, L. I., & Fredrickson, B. L. (2018). Positive affective processes underlie positive health behaviour change. *Psychology & health*, *33*(1), 77-97.

van Eyk, H. J., Paiman, E. H., Bizino, M. B., de Heer, P., Geelhoed-Duijvestijn, P. H., Kharagjitsingh, A. V., ... & Jazet, I. M. (2019). A double-blind, placebo-controlled, randomised trial to assess the effect of liraglutide on ectopic fat accumulation in South Asian type 2 diabetes patients. *Cardiovascular Diabetology*, *18*(1), 1-12.

Van Smoorenburg, A. N., Hertroijs, D. F., Dekkers, T., Elissen, A. M., & Melles, M. (2019). Patients' perspective on self-management: type 2 diabetes in daily life. *BMC health services research*, *19*(1), 1-8.

Waari GK. *Assessment of medication non-adherence and associated factors among type 2 diabetes mellitus patients attending the diabetic clinic at Kenyatta National Hospital*(Doctoral dissertation, JKUAT-COHES). 2019. http://ir.jkuat.ac.ke/bitstream/handle/123456789/5131/Diabetes%20Medication%20Adherence%20Thesis%2010052019.pdf?sequence=1&isAllowed=y.

Waari, G., Mutai, J., & Gikunju, J. (2018). Medication adherence and factors associated with poor adherence among type 2 diabetes mellitus patients on follow-up at Kenyatta National Hospital, Kenya. *Pan African Medical Journal*, *29*(1), 1-15.

Warren, H. C. (2018). *Dictionary of psychology*. Routledge.

Washington, F., & Langdon, D. (2021). Factors affecting adherence to disease-modifying therapies in multiple sclerosis: systematic review. *Journal of neurology*, 1-12.

Wilhelmsen, N. C., & Eriksson, T. (2019). Medication adherence interventions and outcomes: an overview of systematic reviews. *European Journal of Hospital Pharmacy*, *26*(4), 187-192.

Williams, E. D., Tapp, R. J., Magliano, D. J., Shaw, J. E., Zimmet, P. Z., & Oldenburg, B. F. (2010). Health behaviours, socioeconomic status and diabetes incidence: the Australian Diabetes Obesity and Lifestyle Study (AusDiab). *Diabetologia*, *53*, 2538-2545.

World Health Organization. (2014). What's in a name? Compliance, adherence and concordance in chronic psychiatric disorders. *World journal of psychiatry*, *4*(2), 30.

World Health Organization. Diabetes. Geneva, Switzerland: World Health Organization; 2018. https://www.who.int/news-room/fact-sheets/detail/diabetes. Updated October 30, 2018. Accessed March, 2019.

Yavuz, D. G., Ozcan, S., & Deyneli, O. (2015). Adherence to insulin treatment in insulin-naïve type 2 diabetic patients initiated on different insulin regimens. *Patient preference and adherence*, 1225-1231.

Yuen, L., Saeedi, P., Riaz, M., Karuranga, S., Divakar, H., Levitt, N., ... & Simmons, D. (2019). Projections of the prevalence of hyperglycaemia in pregnancy in

2019 and beyond: Results from the International Diabetes Federation Diabetes Atlas. *Diabetes research and clinical practice*, *157*, 107841.

Zhang, X., Devlin, H. M., Smith, B., Imperatore, G., Thomas, W., Lobelo, F., ... & Gregg, E. W. (2017). Effect of lifestyle interventions on cardiovascular risk factors among adults without impaired glucose tolerance or diabetes: A systematic review and meta-analysis. *PloS one*, *12*(5), e0176436.

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.

Zioga, E., Kazakos, K., Dimopoulos, E., Koutras, C., Marmara, K., Marmara, E. E., ... & Lavdaniti, M. (2016). Adherence and quality of life in patients with type II diabetes mellitus in northern Greece. *Materia socio-medica*, *28*(4), 258.

Appendices

Appendices

University of Babylon
College of Nursing
Research Ethics Committee

جامعة بابل
كلية التمريض
لجنة اخلاقيات البحث العلمي

Issue No:
Date: / 1 /2023

Approval Letter

To, احسان جواد رياح

The Research Ethics committee at the **University of Babylon, College of Nursing** has reviewed and discussed your application to conduct the research study entitled " **Health Behaviors and its relationship to Treatment Adherence among Type II Diabetic Patients**".

The Following documents have been reviewed and approved:

1. Research protocol
2. Research instrument/s
3. Participant informed consent

Committee Decision.

The committee approves the study to be conducted in the presented form. The Research Ethics committee expects to be informed about any changes occurring during the study, any revision in the protocol and participant informed consent.

Prof. Dr. Shatha Saadi Mohammed
Chair Committee
College of Nursing
Research Ethical Committee
31 / 1 /2023

Appendices

لجنة الدراسات العليا

استمارة تسجيل (رسالة الماجستير)

اسم الطالب: احسان جواد رياح

تاريخ القبول : 2020-2021 موجلة تاريخ المباشرة بالدراسة : 15/9/2021

السيد رئيس فرع تمريض صحة الاسرة و المجتمع المحترم ارجو التفضل باتخاذ الاجراءات اللازمة للموافقة على عنوان بحثي الموسوم :

Health Behaviours and its Relationship to Treatment Adherence among Type II Diabetic Patients

كموضوع ل (رسالة الماجستير) وفق الخطة المرفقة:

عدد الوحدات المطلوبة للبحث (8) وحدة لغة البحث: اللغة الانجليزية

اسم الطالب وتوقيعه: احسان جواد رياح

اسم المشرف الاول وتوقيعه: أ.د. امين عجيل ياسر

اسم المشرف الثاني وتوقيعه:

استمارة خطة البحث :

١ - عنوان البحث باللغة العربية:

السلوكيات الصحيه وعلاقتها بالالتزام العلاجي لدى مرضى السكري من النوع الثاني

٢ عنوان البحث باللغة الانكليزية:

Health Behaviours and its Relationship to Treatment Adherence among Type II Diabetic Patients

Appendices

جمهورية العـــراق

Ministry Of Health
Babylon Health Directorate
Email:-
Babel_Healthmoh@yahoo.com
Tel:282628 or 282621

وزارة الصحة والبيئة
دائرة صحة محافظة بابـــل
المديـــر العـــام
مركـــز التدريب والتنمية البشرية
لجنة البحوث

استمارة رقم :-٠٣ /٢٠٢١

رقم القرار :- ١٨
تاريخ القرار :- ١٠/ ٢ /٢٠٢٣

قرار لجنة البحوث

تحية طيبة ...

درست لجنة البحوث في دائرة صحة بابل مشروع البحث ذي الرقم (٢٢ /٢٠٢٣/٠ بابل) المعنـون (السلوكيات الصحية وعلاقتها بالالتزام العلاجي لدى مرضى السكري من النوع الثاني) ،
والمقـدم من الباحث(أحسان جواد رياح) إلى وحدة أدارة البحوث والمعرفي مركز التدريب والتنمية البشرية في دائرة صحة بابل بتاريخ ٢٠٢٣/٢/١٣ وقررت :

قبول مشروع البحث أعلاه كونه مستوفيا للمعايير المعتمدة في وزارة الصحة والخاصة بتنفيذ البحوث ولا مانع من تنفيذه في مؤسسات الدائرة .

وزارة الصحة
دائرة صحة بابل
مركز التدريب والتنمية البشرية
لجنة البحوث

مـــــع الاحتـــــرام

الـدكتور
محمد عبد الله عجرش
رئيس لجنة البحوث
٢٠٢٣ / /

نسخة منه إلى :
- مكتب المدير العام / مركز التدريب والتنمية البشرية / وحدة إدارة البحوث ... مع الأوليات.

سوزان

دائرة صحة محافظة بابل / مركز التدريب والتنمية البشرية // ايميل المركز babiltrainning@gmail.com

Appendices

وزارة التعليم العالي والبحث العلمي
جمهورية العراق
Ministry of Higher Education and Scientific Research
جامعة بابل
كلية التمريض
University of Babylon
College of Nursing
UNIVERSITY OF BABYLON

العدد : ٨٤٤٠
التاريخ : ٥ / ٢ / ٢٠٢٣

Ref. No. :
Date: / /

الى / دائرة صحة بابل / مركز التدريب والتطوير
م/ تسهيل مهمة

تحية طيبة :
يطيب لنا حسن التواصل معكم ويرجى تفضلكم بتسهيل مهمة طالب الماجستير (احسان جواد رياح) لغرض جمع عينة دراسة الماجستير والخاصة بالبحث الموسوم:

السلوكيات الصحية وعلاقتها بالالتزام العلاجي لدى مرضى السكري من النوع الثاني .

Health Behaviors and its Relationship to Treatment Adherence among Type II Diabetic Patients.

مع الاحترام ...

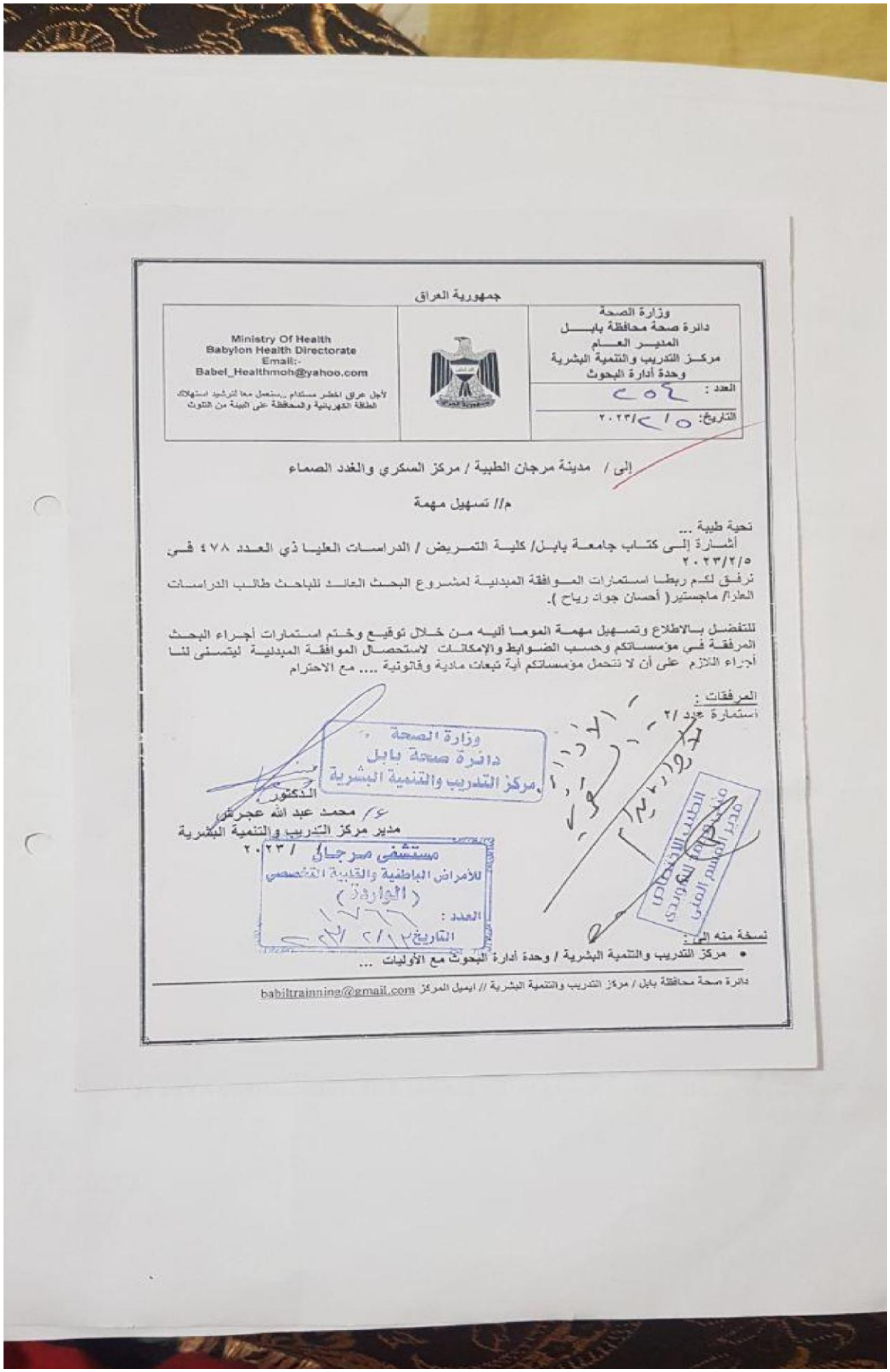
المرافقات //
- بروتوكول.
- استبانة.

ا. د. نهاد محمد قاسم
معاون العميد للشؤون العلمية والدراسات العليا
٢٠٢٣/٢/٥

مسورة عنه الى //
- مكتب السيد العميد للتفضل بالاطلاع مع الاحترام .
- شعبة الدراسات العليا
- الصادرة .

E-mail:nursing@uobabylon.edu.iq
STARS RATED FOR EXCELLENCE
وطني 07711632208
مكتب 009647711632208
www.uobabylon.edu.iq

Appendices



جمهورية العراق

وزارة الصحة
دائرة صحة محافظة بابـــل
المديـــر العـــام
مركـــز التدريب والتنمية البشرية
وحدة أدارة البحوث

العدد : ٤٥٢

التاريخ: ١٠/ ٤/ ٢٠٢٣

Ministry Of Health
Babylon Health Directorate
Email:-
Babel_Healthmoh@yahoo.com

لأجل عراق اخضر مستدام .. نستعمل معا لترشيد استهلاك الطاقة الكهربائية والمحافظة على البيئة من التلوث

إلى / مدينة مرجان الطبية / مركز السكري والغدد الصماء

م// تسهيل مهمة

تحية طيبة ...

أشارة إلـى كتـاب جامعـة بابـل/ كليـة التمـريض / الدراسـات العليـا ذي العـدد ٤٧٨ فـي ٢٠٢٣/٢/٥

نرفـق لكـم ربطـا اسـتمارات المـوافقة المبدئيـة لمشـروع البحـث الخالـد للباحـث طالـب الدراسـات العليا/ ماجستير(أحسان جواد رياح).

للتفضـل بـالاطلاع وتسـهيل مهمـة المومـا اليـه مـن خـلال توقيـع وخـتم اسـتمارات أجـراء البحـث المرفقـة فـي مؤسساتكم وحسـب الضـوابط والإمكانـات لاستحصـال الموافقـة المبدليـة ليتسـنى لنـا أجراء اللازم على أن لا تتحمل مؤسساتكم أية تبعات مادية وقانونية .... مع الاحترام

المرفقات :
استمارة عدد ٢/

وزارة الصحة
دائرة صحة بابل
مركز التدريب والتنمية البشرية

الدكتور
م/ محمد عبد الله عجرش
مدير مركز التدريب والتنمية البشرية
٢٠٢٣ / ٤ / ١٠

مستشفى مرجان
للأمراض الباطنية والغدية التخصصي
(الوارد)
العدد :
التاريخ ٢٠٢٣/٤/١٠

نسخة منه الى :
- مركز التدريب والتنمية البشرية / وحدة أدارة البحوث مع الأوليات ...

Appendices

First : Socio-demographic Characteristics

1. **Age** ☐ year
2. **Gender**

   Male ☐ Female ☐

3. **Monthly Income**

   Sufficient ☐ Sufficient to certain limit ☐ insufficient ☐

4. **Marital Status**

   Single ☐ Married ☐ Separated ☐

   Divorced ☐ Widower ☐

5. **Educational level**

   Not read or write ☐ Elementary School ☐

   Secondary School ☐ Intermediate ☐ school Institute and above ☐

6. **Occupation**

   Government employee ☐ Free business ☐

   Retired ☐ Unemployed ☐

7. **Duration of diabetes:** ☐

   Yes ☐ No ☐

8. **Do you have a chronic disease associated with diabetes?**

   Yes ☐
   No ☐

   ☐

If yes, So what is it

Second: Healthy behavior among diabetics

List	items	Always	Sometime	Never
1	Eat my meals regularly			
2	I am interested in doing my favorite sport			
3	I do activities that make me relax, such as (walking, taking a shower...)			
4	I eat meals that contain all nutrients, including sugars			
5	I do fitness training regularly			
6	I keep myself from getting into accidents			
7	I eat a balanced diet, medication dosage, and physical activity			
8	I sleep enough hours			
9	I do my best to keep specific times for exercise			
10	I do exercises to reach and maintain the ideal body weight			
11	I do things that make me feel energetic			
12	I monitor my blood sugar before and after exercise			
13	Join my friends in fun activities			
14	I avoid drinking caffeine-containing drinks (tea, coffee, cola)			
15	I try to keep my body weight in the right range			
16	Take care of my personal hygiene and good looks			
17	I brush my teeth constantly			
18	I follow the diabetes program when a change to the daily routine is required			
19	I constantly check my feet			
20	I take the exact dose of my medication			
21	I keep medication dose times			
22	Stick to the dosage prescribed by the doctor			
23	I have enough information about the medicines I use for diabetics			
24	I eat my meals at the same time every day			
25	I cut my toenails the right way			

Third: Treatment Adherence among Type II DM

Medication Adherence Scale (MAS-12)

List	Medication compliance	Always	Sometime	Never
1	Over the past 3 weeks, I have taken the prescribed daily dosage of my medication.			
2	Over the past 3 weeks, I have followed the instructions about when or how often to take my medication.			
3	I have stopped taking medication based on my own judgment (not including times when I forgot to take my medication)			
List	Collaboration with healthcare providers			
4	I feel comfortable asking my healthcare provider about my medication.			
5	My healthcare provider understands when I tell him/her about my preferences in medication taking.			
6	My healthcare provider understands when I explain to him/her about my past medication including previous allergic reactions.			
List	Willingness to access and use information about medication			
7	I understand both the effects and the side effects of my medication.			
8	I report side effects, allergic reactions, or unusual symptoms caused by the medication.			
9	I personally search for and collect information that I want about my medicine.			
List	Acceptance to take medication and how taking medication fits patient's lifestyle			
10	I accept the necessity of taking medication in the prescribed manner to treat my illness.			
11	Taking medication is part of my everyday life, just like eating or brushing my teeth.			
12	I sometimes get annoyed that I have to keep taking medicine every day.			

عزيزي المراجع/

إن المعلومات التي تصدر عنك ستكون في غاية السرية ولن تستخدم إلا لغرض البحث العلمي فقط.. لذا يمكنك الإدلاء برأيك بكل جدية ومصداقية

الجزء الاول: المعلومات الديموغرافية:

العمر : ☐

الجنس: ☐ ذكر ☐ أنثى

الدخل الشهري: ☐ لا يكفي ☐ يكفي ☐ يكفي الى حد ما

الحالة الاجتماعية :

☐ ارمل ☐ مطلق ☐ أعزب ☐ متزوج ☐ منفصل

المستوى التعليمي:

☐ خريج ☐ يكتب ☐ يقرأ ويكتب ☐ لا يقرأ ولا
متوسطة ☐ ابتدائية خريج
☐ خريج إعدادية ☐ خريج معهد او كلية

المهنة:

☐ متقاعد ☐ لا يعمل ☐ موظف حكومي ☐ إعمال حرة

☐

☐

مدة الإصابة بمرض السكري:

هل لديك إمراض مزمنة مصاحبة لمرض السكري

كلا ☐ نعم ☐

اذا كانت الاجابة نعم, فما هي

الجزء الثاني: السلوك الصحي بين مرضى السكري

ت	الفقرات	دائما	أحيانا	أبدا
1	تناول وجباتي بطريقة منتظمة			
2	أهتم بممارسة رياضتي المفضلة			
3	أمارس الأنشطة التي تجعلني في حالة استرخاء مثل)المشي, الاستحمام..(			
4	أتناول وجبات غذائية تحتوي على جميع العناصر الغذائية بما فيها السكريات			
5	أقوم بممارسة تدريبات اللياقة البدنية بانتظام			
6	أحافظ على نفسي من التعرض للحوادث			
7	أتناول وجبات غذائية متوازنة مع جرعة الدواء والنشاط البدني الذي أقوم به			
8	أنام عددا كافيا من الساعات			
9	أبذل جهدي للمحافظة على أوقات محددة لممارسة التدريبات الرياضية			
11	أقوم بالتمارين الرياضية للوصول والمحافظة على الوزن المثالي للجسم			

11	أقوم بالأشياء التي تشعرني بالنشاط والحيوية			
12	أتابع نسبة السكر قبل وبعد ممارسة التمارين الرياضية			
13	اشترك مع أصدقائي في النشاطات الترفيهية			
14	أتجنب تناول المشروبات التي تحتوي على الكافيين)شاي, قهوة,			
	كولا(			
15	أحاول أن يكون وزن جسمي في المعدل المناسب			
16	اهتم بنظافتي الشخصية وحسن مظهري			
17	أقوم بنظيف أسناني باستمرار			
18	أتابع برنامج السكري عندما يطرأ تغيير على الروتين اليومي			
19	أفحص قدماي باستمرار			
21	آخذ جرعة دوائي المحددة			
21	أحافظ على أوقات أخذ جرعات الدواء			
22	ألتزم بجرعة الدواء التي يصفها الطبيب			
23	أملك معلومات كافية حول الأدوية التي أستعملها لمرضى السكري			
24	أتناول وجباتي الغذائية في نفس التوقيت كل يوم			
25	أقص أظافر قدماي بالطريقة الصحيحة			

الجزء الثالث: الالتزام العلاجي بين مرضى السكري

ت	الإبعاد	الدرجة		
	اولا: امتثال الدواء	**دائما**	**أحيانا**	**أبدا**
1	خلال الأسابيع الثلاثة الماضية , تناولت الجرعة اليومية الموصوفة من دوائي.			

2	على مدار الأسابيع الثلاثة الماضية , اتبعت التعليمات المتعلقة بوقت تناول الدواء وعدد مرات تناوله.			
3	لقد توقفت عن تناول الدواء بنا ء على تقديري الخاص)لا يشمل الأوقات التي نسيت فيها تناول الدواء(			
	ثانيا: التعاون مع مقدمي الرعاية الصحية	**دائما**	**أحيانا**	**أبدا**
4	أشعر بالراحة عند سؤال مقدم الرعاية الصحية الخاص بي عن دوائي.			
5	يتفهم مقدم الرعاية الصحية الخاص بي عندما أخبره / أخبرتها عن تفضيلاتي في تناول الأدوية.			
6	يتفهم مقدم الرعاية الصحية الخاص بي عندما أشرح له / لها عن دوائي السابق بما في ذلك ردود الفعل التحسسية السابقة.			
	ثالثا: الاستعداد للوصول إلى المعلومات المتعلقة بالأدوية واستخدامها	**دائما**	**أحيانا**	**أبدا**
7	أنا أفهم كلا من الآثار والآثار الجانبية لأدويتي			
8	أبلغ عن الآثار الجانبية أو ردود فعل تحسسية أو أعراض غير عادية ناجمة عن الدواء.			
9	أنا شخصي ا أبحث عن المعلومات التي أريدها عن دوائي وأجمعها.			
	رابعا: قبول تناول الأدوية وكيف يتناسب تناولها مع نمط حياة المريض	**دائما**	**أحيانا**	**أبدا**
11	أوافق على ضرورة تناول الأدوية بالطريقة الموصوفة لعلاج مرضي.			
11	تناول الدواء هو جزء من حياتي اليومية , تما ما مثل الأكل أو تنظيف أسناني بالفرشاة.			
12	أشعر أحيا نا بالانزعاج لأنني يجب أن أستمر في تناول الدواء كل يوم.			

خبراء تحكيم استمارة الاستبانة

ت	اسم الخبير	اللقب العلمي	مكان العمل	الاختصاص	سنوات الخبرة
1	د. سلمى كاظم جهاد	استاذ	جامعه بابل \كليه التمريض	تمريض صحة الأسرة والمجتمع	63
2	د. سحر أدهم علي	استاذ	جامعة بابل \كلية التمريض	تمريض البالغين	63
3	د. فاطمة وناس خضير	استاذ	جامعة الكوفة \كلية التمريض	تمريض صحة الأسرة والمجتمع	63
4	د. نهاد محمد الدوري	استاذ	كليه التمريض \جامعه بابل	تمريض أطفال	63
5	د. ناجي ياسر سعدون	استاذ	جامعة بابل\ كلية التمريض	تمريض صحة الأسرة والمجتمع	82
6	د.شذى سعدي محمد	استاذ	كليه التمريض \ جامعه بابل	تمريض البالغين	83
7	د.ندى خزعل هندي	استاذ	جامعة بابل\ كلية التمريض	علوم طبية	11
8	د.حيدر الحدراوي	استاذ مساعد	جامعة الكوفة \كلية التمريض	تمريض النفسية والعقلية	82
9	د. منصور عبد الله فلاح	استاذ مساعد	جامعة الكوفة \كلية التمريض	تمريض صحة الأسرة والمجتمع	12

المستخلص

داء السكري هو عبء كبير على الصحة العامة يتطلب اهتمامًا فوريًا من اجل الحفاظ على الحياة، والسلوكيات الصحية هي أحد المحددات الرئيسية للالتزام بالعلاج. تهدف هذه الدراسة إلى تقييم السلوكيات الصحية وعلاقتها بالالتزام بالعلاج لدى مرضى السكري من النوع الثاني.

دراسة ارتباطية وصفية أجريت في مدينة الحلة خلال الفترة من 1 أكتوبر 2022 إلى 29 مارس 2023. تم اختيار عينة الدراسة المكونة من 200 مريض وفقًا لمنهج أخذ العينات غير الاحتمالي. تم التحقق من صحة الاستبيان من قبل الخبراء وتم التحقق من موثوقيتها من خلال دراسة تجريبية. تم جمع البيانات من خلال المقابلات وتحليلها من خلال تطبيق التحليل الإحصائي الوصفي والاستدلالي.

أشارت النتائج إلى أن متوسط عمر المشاركين 44.03 سنة ، ومعظمهم من الإناث وخريجي الكليات. وجد أن أكثر من نصف المشاركين في الدراسة (59.5٪ و 88٪) لديهم سلوكيات صحية سيئة وضعف الالتزام بالعلاج. يختلف الالتزام بالعلاج باختلاف العمر والجنس والدخل الشهري والحالة الاجتماعية ومدة داء السكري والأمراض المرتبطة به. يشير الانحدار الخطي البسيط إلى أن الدخل الشهري والمستوى التعليمي من المتغيرات التي تتنبأ بالسلوكيات الصحية ($p = 0.000$). يرتبط الالتزام بالعلاج بشكل إيجابي بالسلوكيات الصحية ($p = 0.000$).

أظهرت الدراسة السلوكيات الصحية والتزام العلاجي كان ضمن المستوى الغير المقبول. يمكن أن يتنبأ السلوكيات الصحية بتحسين الالتزام بالعلاج. تسلط الدراسة الضوء على التثقيف الصحي لجميع شرائح المجتمع تجاه السلوكيات الصحية لدى مرضى السكري من النوع الثاني. هناك حاجة إلى مزيد من الدراسة لاستكشاف الاستراتيجيات التي تحافظ على السلوكيات الصحية بين المرضى من أجل تحسين التزامهم بالعلاج.

جمهورية العراق
وزارة التعليم العالي والبحث العلمي
جامعة بابل
كلية التمريض

السلوكيات الصحية وعلاقتها بالالتزام العلاجي لدى مرضى السكري من النوع الثاني

رسالة مقدمة الى

مجلـــس كلية التمريض جامعة بابل

كجزء من متطلبات نيل درجة الماجستير في علوم التمريض

من قبل

إحسان جواد رياح

بإشراف

أ.د. أمين عجيل الياسري

تشرين الاول/ 2023 ميلادية ربيع الاول/1445 هجرية