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University of Babylon
College of Nursing

Effectiveness of Self-Care Instructional Program for adult Patients on Controlling Type II Diabetes Mellitus in Al- Diwaniyah Teaching Hospital

A Dissertation Submitted to

Council of the College of Nursing, University of Babylon

In Partial Fulfillment of the Requirements for The Degree of Doctorate of Philosophy in nursing

By

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﴿ وَلَقَدْ آتَيْنَا دَاوُودَ وَسُلَيْمَانَ عِلْمًا
وَقَالَا الْحَمْدُ لِلَّهِ الَّذِي فَضَّلَنَا
عَلَى كَثِيرٍ مِنْ عِبَادِهِ الْمُؤْمِنِينَ ﴾

صدق الله العلي العظيم

(النمل : ١٥)

Academic Supervisor Certification

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Dedication

To …

My great parents who never stop giving of themselves in countless ways.

My love & dear wife who leads me through the valley of darkness with light of hope and support.

My beloved brother and sisters who stand by me when things look black.

My beloved kids Zainab Al-howraa, Mohammed Reda and Mohammed Baker whom I can't force myself to stop loving.

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Abstract

Diabetes mellitus is a most common chronic metabolic disorders characterized by hyperglycemia. The hyperglycemia may be caused by a relative insulin deficiency due to decreased insulin secretion, impaired insulin action, or both. Consequent chronic hyperglycemia causes glycation of tissues that typically results in acute metabolic disorders, irreversible organ damage, and serious complications with adverse health consequences.

Self-care is a significant strategy for controlling blood sugar, blood pressure, and cholesterol. Self-care behaviors improve quality of life and health, in addition to increased patient satisfaction, reduced healthcare costs, symptom management, and survival.

Objectives

The objective of the present study is to evaluate the effect of the self –care instructional program on the knowledge and behavior for patients with type 2 diabetes.

Methodology

Quasi-experimental design with the use of pretest and posttest approach for two groups of the samples (study and control) was conducted in Al-Diwaniyah Teaching Hospital from the period of 15th July, 2022 to 17th May, 2023.

The instrument used in the study is composed of two aspects: first aspect demographic variables like the age, gender, education level, marital status, and clinical variables was used smoking, disease duration, type of treatment, family history of T2DM and BMI. And second aspect diabetes Self-Care Scale (DSCS): The Diabetes Self-Care Scale was created in 2005 by American researchers Fisher and Lee to assess the self-care of people with DM. The original scale had a Cronbach alpha of 0.80. The results of the pilot study revealed that after being

applied to 10 patients with T2DM, the reliability of scale's Iraqi version was (r = 0.84).

Results

The majority of patients with diabetes mellitus type 2 were 33 (55 %) female while male respondents 27 patients (45%) attended to endocrine and diabetes center at Al-Dewaynia Teaching Hospital. almost (61.7%) of them were between 50-60 years old and (71.65%) were married, in addition, The most of participants in both groups have educational level no reading & no writing (33.3%) and most the participants are bravely monthly income. The diabetes self-care scale showed that improved self-care among diabetic patients after intervention significantly from 1.79±0.360 to 3.17±0.546 (P: 0.01).

Conclusions

The study concludes that instruction program improves diabetes patients' self-care activities, knowledge, and adherence to diet, physical activity, and medication among those with type 2 diabetes.

Recommendations

Encourage the health care provider to improve diabetic patients' self-care activities and focusing on all domain aspects of self-care. The ministry of health should get attention to the availability of active sessions to educate diabetes patients on how to cope with their disease and improve patients' awareness about the method of healthy coping

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List of Abbreviations

Abbreviations	Word
A	Alpha
ADA	American Diabetes Association
A.D	Anno Domini
B.C	Before Christ
B	Beta
BMI	Body mass Index
DCCT	Diabetes Control and Complications Trail
DM	Diabetes Mellitus
DSCS	Diabetes Self-Care Scale
Et.al	Et alia (and other)
e.g.	Example
FPG	Fasting Plasma Glucose
FFA	Free Fatty Acids
HbA1c	Glycated hemoglobin
HDL	High-density lipoprotein
IGT	Impaired glucose tolerance

IDDM	Insulin-Dependent Diabetes Mellitus
IDF	International Diabetes Federation
IQD	Iraq Dinar
LDL	Low-density lipoprotein
MENA	Middle East and North Africa
MENA	Middle East and North Africa
NHANES	National Health and Nutrition Examination Survey
NCDs	Non-communicable diseases
NIDDM	Non-Insulin Dependent Diabetes Mellitus
NGT	Normal glucose tolerance
OGTT	Oral Glucose Tolerance Test
ORI	Oregon Research Institute
QOL	Quality Of Life
RBS	Random Blood Sugar
SMBG	Self-Monitored Blood Glucose
T1DM	Type 1 Diabetes Mellitus
T2DM	Type 2 Diabetes Mellitus
USA	United States of America
WHO	Word Health Organization
Statistical symbol	
OR	Odds ratio
CI	Confidence interval
SPSS	Statistical Package for Social Sciences
F	Frequency

%	Percentage
SD	Standard Deviation
M.S	Mean of scores

Chapter One
Introduction

Chapter One

Introduction

1.1. Introduction:

Diabetes mellitus (DM) is a most common chronic metabolic disorders characterized by hyperglycemia. The hyperglycemia may be caused by a relative insulin deficiency due to decreased insulin secretion, impaired insulin action, or both. Consequent chronic hyperglycemia causes glycation of tissues that typically results in acute metabolic disorders, irreversible organ damage, and serious complications with adverse health consequences (Petrovic et al., 2019; Ouyang, 2007).

Diabetes is divided into three types: type I, type II, and gestational Diabetes. Type I diabetes is defined by an insulin insufficient that requires daily insulin therapy. However, type II diabetes is caused by the body's inefficient utilization of insulin, while gestational diabetes is hyperglycemia that begins during pregnancy or is initially diagnosed at that time. As a result, insulin therapy is often an essential aspect for controlling diabetes and is a cornerstone of type I diabetes treatment. It may also be used to control many type II diabetes patients (American Diabetes Association, 2014).

Type 2 diabetes, previously referred to as noninsulin-dependent diabetes or adult-onset diabetes, accounts for 90-95% of all diabetes. This form encompasses individuals who have relative) rather than absolute) insulin deficiency and have peripheral insulin resistance. At least initially, and often throughout their lifetime, these individuals may not need insulin treatment to survive (Baynest, 2015).

Insulin resistance and reduced insulin secretion are the two primary issues with insulin in T2DM. Insulin resistance is known as a reduction in the sensitivity of cells to insulin. Insulin normally attaches to specific receptor on

cells surface and triggers a sequence of glucose-metabolizing processes (Ajlan & Mahmood, 2011).

Diabetes is a chronic illness that requires continuous medical care for life and education and support for patient self-management to prevent acute complications and risk of long-term complications such as nephropathy, retinopathy, and neuropathy. Diabetes self-care activities are behaviors undertaken by people with or at risk of diabetes to successfully manage the disease on their own. Self-care management of diabetes is complex. It needs a multi-faceted approach which requires the patient to follow certain guidelines such as healthy eating, being physically active, regular monitoring of blood sugars, taking regular medications, good problem-solving skills, healthy coping skills and risk-reduction behaviors to achieve an optimum glycemic control, and prevent complications in future (Garg et al., 2017).

Therefore, diabetes treatment requires education. Diabetes education aims to change the patient's behavior by increased motivating them to follow therapeutic recommendations, improving their quality of life, establishing a partnership within the treatment process, preparing them for self-care, increasing their awareness of cardiovascular risk factors, and improving their psychological resilience. However, several factors, including the patient's psychological and socioeconomic characteristics as well as educator-related variables, influence the educational process. Diabetes education has been demonstrated to primarily help patient self-care and metabolic management. (Swiątoniowska et al, 2019).

Self-care plays a crucial role in the management of diabetes, these activities including maintaining healthy eating, regular exercise, and self-control blood sugar levels by monitoring, and taking prescribed medications. If these are neglected, the disease will worsen, but if followed, they can help prevent cardiovascular complications, which account for as much as 80 % of deaths among diabetics. As a result, self-care activities are considered to be crucial in managing chronic diseases like diabetes (Arulmozhi and Mahalakshmy, 2014).

However, Self-care may be difficult to apply and often requires changes in lifestyle, which most patients ignoring despite receiving medical recommend leading to an increase in the problems. Patients' compliance with self-care activities is important for achieving the desired outcomes. Patients with type II diabetes may benefit from program that are specifically designed to help with their knowledge deficits and poor self-care behaviors if these problems are determined (Gesare, et al., 2014; Mohebi, et al., 2014).

On the other hand, Self-care is an important strategy for controlling blood sugar, blood pressure, and cholesterol. Self-care behaviors improve health and quality of life, as well as increased patient satisfaction, reduced healthcare costs, symptom management, and survival (Vazini & Barati, 2014).

Seven crucial diabetic patient self-care behaviours with expected positive outcomes, These include following a healthy diet, having good problem-solving skills, have body with energy, taking treatment regularly, monitoring blood glucose level , using healthy coping mechanisms, and engaging in risk-reducing behaviours, all of which have been displayed to be positively related to blood glucose control, which decreases complications and improves quality of life (Gopichandran et al., 2012; Shrivastava et al., 2015).

Moreover, Diabetes management is associated with lifestyle management, medication adherence, meal planning, physical activity, weight control, monitoring blood glucose, and patient psychological management. Self-care behaviors adherence is important to avoid diabetes mellitus complications and improved the quality of life (Putra et al., 2019)

Controlling blood sugar levels is still important in the management of diabetes mellitus, particularly to avoid microvascular risks. Controlling glucose levels takes time to improve macrovascular problems (Dandona & Chaudhuri, 2017).

Self-management of glycemic levels can significantly decrease the incidence of diabetes-related complications. However, self-management of

diabetes and glycemic control are challenging and can be further problems common related to treatment plan adherence. Most diabetes studies have found that a significant percentage of patients fail to engage in adequate self-management. Inadequate adherence to self-management is well documented as negatively effecting outcome in patients with diabetes (Carpenter et al., 2019).

Therefore, patients with type 2 diabetes who adhere to prescribed treatment regimen had a reduced risk of all-cause mortality and hospitalizations. Despite this, a significant number of people with Type-2 diabetes continue to not take their medication as prescribed, resulting in poor outcomes. Therapeutic inertia and a failure to adhere are the primary reasons that are not achieving targets (Khunti et al., 2019).

On the other hand, diabetes management requires several complex self-care behavior, including lifestyle modifications (such as dietary control, regular exercise, and psychological coping skills) and medical self-care (medication prescription and self-monitoring of blood glucose). To prevent complications and prolong life, self-care must be continuous. Diabetes severity increases annually because of the patient's decrease of knowledge and poor self-care. Well-informed patients can better control hyperglycemia and cardiovascular risk factors. Poor self-care can lead to poor long-term metabolic control and diabetes complications such as retinopathy, neuropathy, nephropathy, and atherosclerotic problems. Thus, patients need self-care education ranging from lifestyle education to medication prescription (cardiovascular risk factors like smoking, obesity, regular medical and ophthalmological examinations, foot care and diet) (Jackson et al., 2014).

Focusing on self-care management of diabetes mellitus in developing countries such as Iraq, where resources are limited and treatment costs are raising, may improve treatment outcomes and costs, particularly when medication compliance is low due to lack of knowledge about the disease and its complications.

1.2. Importance of the Study:

Diabetes is one of the most common non-communicable chronic diseases, 451 million people globally had diabetes in 2017, and by 2045, that number is expected to rise to 693 million, according to the International Diabetes Federation (IDF). Uncontrolled diabetes may result in both macro- and microvascular problems including heart disease, stroke, kidney failure, blindness, and lower limb amputation. An estimated 5 million deaths globally in 2017 were directly related to diabetes (Marathe et al, 2017).

More than 135 million people had diabetes globally in 1997, according to the World Health Organization (WHO), and by 2025, the number will increase by 120%. In the United States, around 50% of diabetes patients remain undiagnosed. The National Health and Nutrition Examination Survey (NHANES) revealed that despite advancements in pharmacology, diabetes treatment devices, and a focus on treatment adherence, 43–45% of diabetes patients did not attain the glycaemic target of HbA1C 7%. Diabetes causes nearly one million deaths each year, with developing nations accounting for two-thirds of these deaths. Diabetes was most often associated with chronic microvascular and macrovascular complications (Ali et al., 2018).

However, diabetes type II is a chronic disease that often develops without manifestations for years. It is the most common type of diabetes worldwide, followed by Diabetes type I and gestational. About 85–95% of diabetes cases are type II. Diabetes and affluence -related diseases including cardiovascular disease and obesity are serious health problems in the 21st century. The number of diabetics is expected to rise to over 330 million by 2025 (representing 6.5% of the world's population) and increased to 600 million by 2035 (Rosiek et al., 2016).

In addition, DM is one of the main causes of death. Around 60 million people in Europe, or 10.3% of men and 9.6% of women over 25 years old, were diagnosed with diabetes. The WHO estimates that 347 million adult in the world have diabetes, and that the number of deaths caused to the diabetes would double between 2005 and 2030 (Fadhil & Wang, 2019).

According to Aziz et al. (2018), about 75–80% of type 2 diabetes patients resided in low-and middle-income countries. After China, India has more than 69 million type II diabetic patients, a number that is expected to increase by double in 2040. There are 36.5 million people in India who have impaired glucose tolerance (IGT), a condition that may progress to type II diabetes.

In Iran, the number of diabetes patients is expected to rise to six million by the year 2030, according to the World Health Organization report. Control of diabetes is important because diabetes is one of the most serious health problems facing people all over the world, and because vascular disorders caused by diabetes are a leading cause of morbidity and mortality. Diabetes complications can be reduced by controlling blood sugar (Zareban et al., 2013).

Jordan has the highest diabetes prevalence in the world, making it a serious health problem. From 2002 to 2004, the diabetes prevalence in Jordan increased from 6.3% to 7.4%. The prevalence of diabetes among Jordanians aged 25 and older increased by 31.5% between a 1994 survey and a 2008 study (Alghadir et al., 2016).

In addition, diabetes affecting 366 million people worldwide, half of them was undiagnosed. Six of the top 10 diabetes countries are in the Middle East (Kuwait, Lebanon, Qatar, Saudi Arabia, Bahrain, and the United Arab Emirates). Nearly 20.5 million Arabs had diabetes and 13.7 million are in the prediabetes stage had impaired glucose tolerance in the 20 countries (International Diabetes Federation., 2011).

However, Meo et al., (2019) stated that diabetes affects 425 million people worldwide, including 39 million persons in the Middle East and North Africa (MENA) region. In Arab, the Kingdom of Saudi Arabia has the highest prevalence of diabetes (31.6 %), followed by Oman (29 %), Kuwait (25.4 %), Bahrain (25%), and (25%) of the United Arab Emirates

While the prevalence of Type II diabetes mellitus in Iraq reached epidemic levels in 2007, impacting nearly 2 million individuals, or 7.43% of the country's total population. Long-term consequences are more likely with diabetes in any type. These may not show up for between 10 and 20 years (Ali et al., 2019).

The International Diabetes Federation reported in December 2011 that showed (21.1%) in Kuwait, (20.2%) in Qatar, (20.2%) in Lebanon, (20.0%) in Saudi Arabia, (19.9%) in Bahrain, and (19.2%) in the United Arab Emirates seemed to have the highest prevalence of diabetes in adults aged 20–79years.

Diabetes prevalence in Iraq is uncertain, based on 2006–2007 surveys; Iraq has a medium prevalence (9.3%) of diabetes in the Middle East. According to studies done in 2010, about 21.9% of Iraqis living in Sweden were diagnosed with diabetes. In the study of adults in Basra, which was conducted in Southern Iraq, they showed that one of every five subjects had diabetes (Mansour et al., 2014).

Also diabetes is the second-highest level in patients under the age of 60 in the MENA region (Middle East and North Africa), and an estimated 51.8 % of deaths in those under 60 years of age. The estimated T2DM prevalence in Iraq ranges from 8.5 to 10.9% (Mikhael et al., 2019).

Therefore, from above information, the researcher noticed the importance of construct instructional program that enhances type II diabetic patients' self-care in Al-Diwaniyah City. Therefore, the need for a more understanding of the

difficulties of self-care of patients individuals who have positive attitudes towards diabetes management will be more likely to adjust the self-care behavior in order to control sugar levels in the blood of those who have negative attitudes. The primary emphases of this study will be on the performance of primary self-care activities.

1.3. Problem Statement:

The broad objectives of this study was to investigate the degree of reported frequency of performing different diabetes self-care behaviors, and to identify background characteristics and factors that influence those performances among adult Patients with type II diabetes mellitus in Al-Diwaniyah Teaching Hospital who received instructional program about diabetes self-care. The ultimate goal was to improve self-care behaviors and therefore control of type 2 diabetes and thus to better health outcomes and quality of life. It is to be hoped that this study will serve as the basis for future efforts to formulate health policies to improve diabetes self-care and therefore may possibly to decrease morbidity and mortality among type 2 patients in Iraq

1.4. Objectives of the Study:

The present study aims are to:

1. Assess the diabetes patients need for instructional program on self-care .
2. Finding an instructional program to enhance self- care for patients with diabetes mellitus type II.
3. Evaluate effectiveness of an instructional program on self-care for patients with diabetes mellitus type II in pre and post applied instructional program.
4. Determine the effect of demographic and clinical data on the effectiveness of the instructional program on self-care for patients with diabetes mellitus type II.

1.5. Hypotheses

Null Hypothesis:

There is no significant positive effectiveness of the program on patients' self-care with diabetes mellitus type II in Al-Diwaniyah City

Alternative Hypothesis:

There is significant positive effectiveness of the instructional program on patients' self-care with diabetes mellitus type II in Al-Diwaniyah City

1.6. Research Question

Is there significant positive effectiveness of the program on patients' self-care with diabetes mellitus type II in Al-Diwaniyah City?

1.7. Definition of the Terms:

1.7. 1. Effectiveness:

a. Theoretical definition:

Demonstrates the success attained when using the resources to complete the stated objectives by comparing the outcome obtained with the outcome that was predicted by the program (Florina, 2017).

b. Operational Definition:

Positive desired outcomes required after exposing diabetes mellitus Patients to an instructional program focusing on self-care.

1.7. 2. Instructional Program:

a. Theoretical Definition:

It is instruction list or training list provided by institution for their employees. The program is held at the institution and is designed to increase workers' knowledge, abilities, and competence in a given subject. It may also be used as part of personnel development (Nam et al., 2011).

b. Operational Definition:

An instructional plan prepared for patients with diabetes mellitus type 2 for teaching and instructing them about self-care to understand how to perform right daily self-care to avoid complication.

1.7. 3. Self-Care:

a. Theoretical definition:

The individual's activities and behaviours that aimed to promote good change that are directed to well-being related to physical, psychological, and spiritual states (Maikeow, 2012).

b. Operational definition:

Self-activities performed by the diabetic patient to maintain his health status and prevent complication. Which included healthy eating, exercise, monitoring, medications, stress management, general hygiene, weight control and body safety domains.

1.7. 4. Patients:

a. Theoretical Definition:

A person who is the recipient of health care or treatment (WHO, 2012).

b. Operational Definition:

Is an individual who suffers from diabetes mellitus type II who has deficient knowledge about self- care attend Al- Diwaniyah center for diabetes and endocrine disorders

1.7. 5. Diabetes Mellitus Type II:

a. Theoretical Definition:

Type II diabetes mellitus also known as non-insulin dependent diabetes mellitus is the most common form of diabetes mellitus characterized by hyperglycemia, insulin resistance, and relative insulin deficiency (Khatoon et al., 2018).

b. Operational Definition:

Type II diabetes mellitus is a form of diabetes that is characterized by high blood sugar, insulin resistance, and relative lack of insulin.

Chapter Two
Literature Review

Chapter Two

Literature Reviews

One of the most important aspects of scientific research is a review of related literature, which includes information and studies on research problems.

2.1. Historical background

Diabetes is a very old disease; it was first recorded by the ancient Egyptians. And described in an Egyptian medical document called the Ebers Papyrus, written around 1552 B.C., as a condition characterized by excessive urination. Patients reported extreme thirst, weight loss, boils, and infections. Susrata, an Indian physician, recognized gluttony in diabetic patients in 400 B.C., especially when eating too much rice, flour, and sugar. He examined for diabetes by pouring urine near an anthill; if the ants swarmed over the anthill, the urine clearly contained sugar, and the patient was diagnosed with diabetes. The term "diabetes" was invented five hundred years later, in the second century A.D., by Greek physician Aretaeus, who described diabetes as a alarming problem, uncommon among men, characterized by the breakdown of flesh and limbs into urine. Although ancient physicians could describe the noticeable symptoms of diabetes, they had no idea how to effectively treat it or alleviate patients' suffering (Ambrose, 2014).

The term "diabetes" or "to pass through" was used by the Greek Apollonius of Memphis in 230 BC. During the Roman Empire, the disease was considered uncommon, with Galen stating that he had only seen two cases during his career. This might be because of the ancients' diets and lifestyle, or because the symptoms were noticed during an advanced stage of the disease. The disease was named "urine diarrhea" (Poretsky, 2010; Laios *et al*., 2012).

However, Menon el at., (2015) declared that the diabetes is derived from Latin and ancient Greek and literally means "a passing through; a syphon". Diabetes, which means "running through a syphon", is based on the ancient notion that in this condition, all fluids consumed rapidly run through the body to be excreted in urine, resulting polyuria. Mellitus is a Latin word that means "honeysweet". It was given the name mellitus by Thomas Wills in 1675 because patients with diabetic urine had a sweet taste. However, the ancient Greeks and Indians had already commented on this sweet taste.

In 1776, Thomas Wills, a professor who discovered the sweetness of urine, described the relationship between diabetes and frequent urination as Pissing evil. The first description of hyperglycemia was published in 1776 by Liverpool physician Matthew Dobson, who found that the serum and urine of one of his patients tasted delicious (Pickup and Williams, 2003).

Arctaeus of Cappadocia used the name diabetes. Its root is the Greek term Diabaincin, which was created by combining the verb beinein (to walk or stand) with the prefix dia- (across, apart). The name diabetes derives from the Greek diabeinin, which means to stride, stroll, or stand with legs apart. As a result, it refers to someone who straddles, more specifically a compass or syphon. The "sense siphon" caused an illness characterized by increased urine output (Dobson, 2011).

However, Scottish physician John Rollo developed the first medical diet for diabetes, which included rotting meat, blood pudding, and a combination of milk and limewater. He added the term mellitus to distinguish diabetes from diabetes insipidus (the Greek word for honey) (Poretsky, 2010).

2.2. Theoretical Framework

The theoretical framework is a guide for the research presented in dissertation. It provides direction for the study and a framework for defining the philosophical, epistemological, methodological, and analytic. An Eisenhart description of a theoretical framework is s “a structure that guides research by relying on a formal theory…constructed by using an established, coherent explanation of certain phenomena and relationships”. Therefore, the theoretical framework includes the theory (or theories) selected to support the thinking about how they understand and plan to investigate the problem as well as the relevant concepts and definitions from that theory (Osanloo & Grant, 2016) .

2.2.١. Orem’s self-care theory

Orem theory of self-care focused on behavior for the maintenance of life. Human beings use their health and well-being to their advantage. When applied successfully, they help to maintain people's completeness and activity (Neta, et al., 2015).

Self-care refers to the actions of people included to ensure stable functioning, continual personal growth, and well-being. Self-care is further characterized to include regular evaluation of symptoms and commitment to medication. The theory of self-care is the basis for three other hypotheses, including self-care theory, self-care deficit theory, and nursing systems theory (Orem, 2002).

Dorothea Orem's theory is widely used in the healthcare setting and helps nurses in improving the health condition of patients by making them independent. A nurse can help a patient recover quickly by integrating scientific principles into the procedure. It is usually used in primary care and rehabilitation facilities, where patients are encouraged toward self-care (Younas, 2017).

The active participating of patients with diabetes in self-care activities is a critical component in the treatment of Diabetes. More than 95% of the management is done by the patient and their family (Neta et al., 2015).

Orem self-care model is one of the most comprehensive self-care theories available, providing a useful clinical guidance for planning and executing good self-care principles. Orem believes that people are able to care for themselves, and that when this ability is distorted in a patient, nurses may help patients restore this ability by providing immediate care and compensating instructional supports (Borji et al., 2017).

According to Dorothea, nursing care is required when the patient is affected by disabilities that affect their practice and self-care needs. Diabetes mellitus is an example of these limitations; the self-care should be handled in a manner that the client or his family will get support as much as possible to recover the patient's self-care ability (Kirkevold, 2000) .

Therefore, Orem theory consists of three integrated theories: (self- care, self-care deficit, and nursing systems). The philosophy of self-care deficit nursing is created for patients who are unable to manage their condition requirements, even with the help him by family members of the management. If they are unable to provide essential management, there will be a need for self-care, which a nurse may provide (Johnson and Webber, 2015).

According to Hagran and Fakharany (2015), The theory of self-care deficit decides when nursing care is required. Nursing is required when an adult (or in the case dependent, the parent) is unable or restricted in the providing of persistent effective self-care. A self- care deficit existing when the therapeutic self-care requirement exceeds self-care ability .

Dorothea Orem classified three types of nursing practice in nursing systems:

1. Wholly compensatory system, in which nursing replaces individuals in self-care;
2. partially compensatory system, in which people require nursing only to assist them in carrying out what they are unable to do on their own; and
3. Supportive-educative system, in which people are capable of performing self-care but require nurses to teach and supervise them while performing it. Informal caregivers might receive from the supportive-educational system (Queiros et al., 2014).

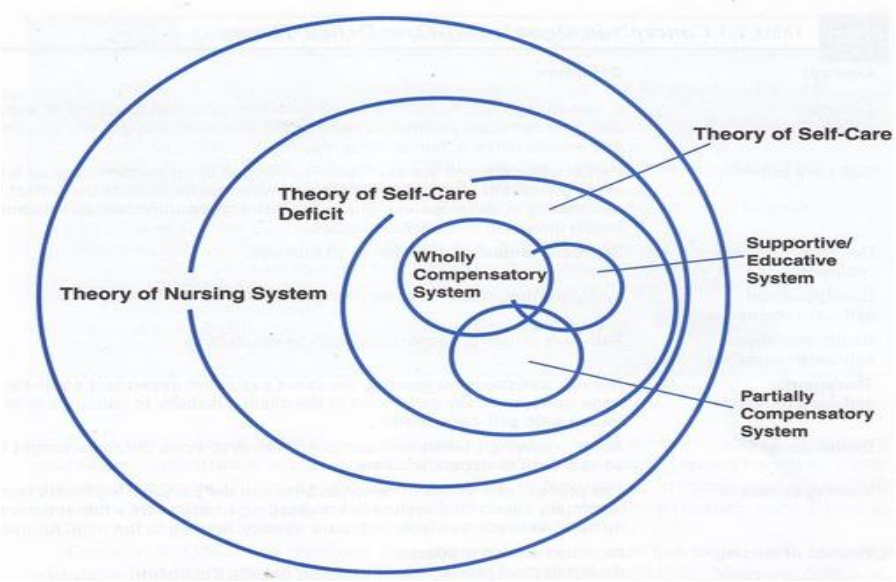

Figure (2-1) Self-Care Deficit Nursing Theory (Orem, 2001)

The patient is unable to perform any self-care activities and must rely on the nurse to perform them in the wholly compensatory system while in the partially compensatory system; both the patient and the nurse perform self-care activity, with the nurse taking on a main role as the self-care demand changes.

When patients regain the ability to provide for themselves, their need for nursing care reduced (Johnson and Webber, 2015) .

According to Mohammed & Hamza, (2016), In Orem theory there are (5) specifies methods which the nurses could apply to help in meeting the self-care patient's needs :

- Performing activities for others .
- Managing and leading.
- Applying physical supports .
- Applying psychological support.
- Environmental and teaching support should be provided.

2.3. Diabetes Mellitus overview

2.3.1. Definition of Diabetes Mellitus

Diabetes Mellitus is a persistent metabolic, progressive endocrinological problem of the carbohydrates, proteins, and fat metabolism characterized by increased blood glucose level due to either an absolute insulin deficit in type I diabetes or a relative insulin deficiency and insulin resistance in type II diabetes (Jackson et al., 2014).

Diabetes refers to a collection of metabolic illnesses defined by an elevated blood glucose level resulting from abnormalities in insulin production, insulin action, or both. Diabetes causes long-term organ damage, malfunction, and failure, particularly in the kidneys, eyes, nerves, heart, and blood vessels (American Diabetes Association [ADA], 2013).

2.3.2. Classification of Diabetes Mellitus

Diabetes is divided into the following categories: diabetes type I (due to autoimmune -cell destruction, usually leading to relative insulin deficiency), diabetes type II (due to a progressive loss of adequate β-cell insulin secretion commonly on the background of insulin resistance), gestational DM (DM diagnosed in the second or third trimester of pregnancy that wasn't clearly overt diabetes before to gestation), specific types of diabetes due to other causes, e.g., monogenic diabetes syndromes (such as neonatal diabetes and maturity onset diabetes of the young), diseases of the exocrine pancreas (such as cystic fibrosis and pancreatitis), and drug or chemical induced diabetes such as with glucocorticoid use in the management of HIV/AIDS, or after organ transplantation (American Diabetes Association, 2014a).

Diabetes type I and type II are heterogeneous disease in which varying clinical manifestations and disease progression. Although categorization is crucial for defining treatment, some people can't be categorized as type I or type II diabetics at the time of diagnosis. Diabetes type II occurs in adults while diabetes types I in children, so the old classifications are no longer accurate. Diabetes type I is characterized by polyuria/polydipsia and diabetic ketoacidosis (DKA) and about one-third of children (Dabelea et al., 2014).

2.3.3. Diabetes Mellitus Type II

Diabetes Mellitus Type II (also known as non-insulin dependent DM) affects usually exclusively adults and is described by insulin resistance manifested as hyperinsulinemia and hyperglycemia. It is closely related with obesity, physical inactivity, and a family history of DM and it accounts for 90% of all diabetes (Ouyang, 2007).

In addition, type II diabetes is a metabolic diseases described by chronic hyperglycemia resulting by resistance of insulin in the peripheral tissues, insufficient insulin secretion, and decreased suppression of glucagon secretion in response to ingested glucose (Boada et al, 2013).

Therefore, Insulin resistance and decreased insulin secretion are the two major insulin disorders in diabetes type II. Reduced tissue insulin sensitivity causes to the insulin resistance. Insulin is a hormone that binding to specific receptors on the surface of cells and starting a series reaction including glucose metabolism. Intracellular reactions are reduced in diabetes type II, and causing insulin less effective at stimulating glucose absorption by tissues and regulating liver glucose release. In the diabetes type II the specific mechanism causing insulin resistance and decreased insulin secretion are unknown; however genetic factors are believed to play a role (Hinkle and Cheever, 2018).

To prevent blood glucose accumulation and overcome insulin resistance, increased insulin must be secreted to keep the glucose level normal or increases level slightly. Glucose levels rise and type 2 diabetes occurs when beta cells can't keep up with increasing insulin demand. In addition, insulin resistance also led to metabolic syndrome, a group of symptoms including abdominal obesity, hypertension, hypercholesterolemia, and other abnormalities (Grossman & Porth, 2014).

Moreover, People with type 2 diabetes are also concerned about their blood sugar. The problem for those individuals is that, while they can make insulin, their cells aren't sensitive to the message it delivers. If cells aren't sensitive to the message delivered by insulin, their body will secrete more insulin in order to give the message to the cells to open and receive glucose. A major problem arises when cells become exhausted because they eventually stop secrete insulin on their own. The combination of over production of insulin, the

body's inability to regulator blood sugars, and increased blood sugar levels result in increased health complications (Frazer, 2019).

Furthermore, type 2 diabetes is described by decreased insulin production from pancreatic beta-cells and insulin resistance in peripheral tissues. Moreover, insulin resistance increased fatty acids in plasma, resulting in reduced glucose transport into muscle cells and increased fat breakdown, which causes an increased glucose production from liver. DM type 2 progress when pancreatic beta -cell dysfunction and insulin resistance occur (Al-Goblan et al., 2014).

2.3.4. Pathophysiology of Type II Diabetes Mellitus

Type II Diabetes Mellitus involves at least two primary pathogenic mechanisms: (a) a progressive decline in pancreatic islet cell function resulting in reduced insulin secretion and (b) peripheral insulin resistance resulting in a decrease in the metabolic responses to insulin. This dynamic interaction between insulin secretion and insulin resistance is essential to the maintenance of normal glucose tolerance (NGT). The transition from the normal control of glucose metabolism to type 2 diabetes mellitus occurs through the intermediate states of altered metabolism that worsen over time. The first state of the disease is known as prediabetes, and consists of a set of metabolic disorder characterized by a great hyperglycemia, enough to increase of retinopathies, nephropathies and neuropathies incidence. If we advance in the T2DM temporal sequence we found a remarkable change in the pancreatic cells population that form the Langerhans islets, mainly caused by amylin fibers accumulation over these cells from polypeptide hormone called amyloid polypeptide or IAPP. The IAPP hypersecretion and amylin fibers deposition attached to the endoplasmic reticulum stress caused by excessive workload due to biosynthesis overproduction of insulin and IAPP result in β-cell apoptosis. In addition to these alterations, we must also consider the changes observed in incretins

profiles like GIP (glucosedependent insulinotropic polypeptide) and GLP-1 (glucagon-like peptide 1) directly related to glucose homeostasis maintenance. Risk factors that predispose to a healthy individual to develop T2DM are several, but the most important is the obesity. The body mass index (BMI) has been used in numerous epidemiological studies as a powerful indicator of T2DM risk. Lipotoxicity caused by circulating free fatty acids increased, changes in lipoprotein profiles, body fat distribution and glucotoxicity caused by cells over-stimulation are other risk factors to consider in T2DM developing (Boada et al, 2013).

2.3.5. Risk Factors

Pre-diabetes and Type 2 diabetes mellitus are significantly influenced by lifestyle factors such as nutrition, physical activity, sedentary lifestyle, stress, and sleep. Regardless of obesity levels, many of these activities, such as sugar eating, lead to impaired glucose management (Spruijt-Metz et al,. 2014).

The global changes in lifestyle brought on by social progress and rapid urbanization are an important factor contributing to the ongoing increase in the number of people with T2DM. Some of them had sedentary lifestyles, don't follow healthy nutrition guidelines, consume a lot of processed foods, and are stressed and exhausted. This is true not just for developed countries, but also for those with citizens who have a medium or low social status. Regardless of social status, the problem of this disease's incidence involves the overall world. Therefore, diabetes is both a health and an economic problem. Many T2DM patients were middle-aged and at the top of their professions' and economy's productivity (Rosiek et al., 2016) .

Stated that gender (Male) has been recognized as a risk factor for diabetes type 2 development. It is unknown why males are more likely than females to

contract this illness. Another potential contributing factor is the general rise in obesity rates. However, men appear to be at higher risk of developing diabetes type 2 than do women with similar BMI, and obesity seems to be more common in men than in women (Nordstrom et al., 2016).

T1able 2.1: Causes and Risk Factors of Diabetes Mellitus:

Risk factors	
Modified	Non-modified
Sedentary lifestyle	Age
Obese people	Family history
Metabolic syndrome	Gender
Dietary factors	Ethnicity
Intrauterine environment	History of gestational diabetes
Previously identified IGT/IFG	Polycystic ovary syndrome
Inflammation	

(Yadav, et al., 2008; Holt and Hanley, 2012; Talwalkar, 2015).

2.3.5.1. Obesity/ Body Mass Index (BMI)

Obesity is considered one of the most common and neglected public health problems in developed and developing nations, according to the WHO. Hypertension, diabetes, dyslipidemia, CVDs, and some cancers are associated with obesity. Approximately 88% of type 2 diabetes patients were overweight or obese, contributing to the epidemic (Vasanthakumar & Kambar, 2020).

Most people who are overweight or obese have some degree of insulin resistance, but type 2 diabetes only occurs in those who do not secrete enough insulin to meet the level of insulin resistance. The glycemic control of these individuals is impaired even if their insulin levels are high (Al- Goblan et al., 2014)

Obesity is the most important environmental trigger of TIIDM. Obesity is described as including a body mass index of 30 or greater. Genetics have a big part in obesity and, in developing TIIDM. Somehow, to have a lot of fat in the body this can produce insulin resistance. For so many years, TIIDM can be managed with diet regimen and practicing exercise. Reduction of weight with growing the muscle size while reducing the total body fat can facilitate the body for better utilization of insulin. Also there is association between TIIDM and the location of storing fat. People with excess fat in the abdomen; they can have more chances of developing TIIDM than those with increasing fat on their hips and thighs (Holt and Hanley, 2012).

However, in type II diabetes there is unknown specific etiology, with no autoimmune damage of B-cells can occur; but the most of patients with TIIDM are obese. Obesity can cause insulin resistance (Defronzo et al., 2015).

2.3.5.2. Unhealthy Diet

Diabetes is caused by an unhealthy diet (high in sugar, salt, fat and deficient in fruits, fiber and vegetables). Non-communicable diseases (NCDs) like diabetes can be prevented by a healthy lifestyle that includes regular exercise, restricted alcohol and cession smoking, and a diet rich in fruits, vegetables, and low in salt, sugar, and saturated fats (Caperon et al., 2019).

Moreover, dietary habits contribute to general health. According to population-based studies, particular unhealthy eating behaviors, such as missing

breakfast, snacking between meals, and eating at night, are related with an elevated risk of diabetes (Huang et al., 2017).

2.3.5.3. Physical inactivity

One of the most important modifiable risk factors for diseases like diabetes is a lack of physical activity. Physical activity reduces metabolic risks and improves blood glucose and lipid profiles in diabetes patients, helping them weight management (Sarbazi et al., 2019).

Physical inactivity has been studied a lot as a factor in how Type 2 diabetes develops. Physical inactivity increases the risk of type 2 diabetes and makes its management more difficult. On the other hand, regular physical activity can not only prevent the development of T2DM, but it can also increase the effects of the antidiabetic drugs therapy, which improves glycemic control (Anjana & Mohan, 2016) .

Furthermore, several studies showed that the risk of diabetes rises when physical activity decreases. Physical activity is a necessity for maintaining human health, preventing or delaying the onset of type 2 diabetes, effectively managing diabetes, and decreasing mortality. Public health and chronic disease treatment, particularly T2DM priority achieving the optimum physical activity level (Abramczyk, 2018).

The majority of urbanites now have sedentary lifestyles that include constant use of automobiles, even for short distances, long hours spent sitting at offices or study tables, and a greater emphasis on watching television and using computers throughout their entire lives. The prevalence of diabetes and heart disease has increased as a result of these practices (Raman, 2016).

2.3.5.4. Smoking

Cigarette Smoking is a major modifiable risk factor for DM. Smoking causes vascular damage, endothelial dysfunction, and blood-clotting cascade activation; therefore it is not unexpected that high blood glucose and smoking exacerbate vascular damage in diabetes smokers. (Campagna et al., 2019.)

Smoking and diabetes increased mortality and morbidity. People who smoke with diabetes are risk coronary heart disease and microvascular complications. Smoking and diabetes contribute 65% of cardiovascular deaths. Smoking increases insulin resistance, decreased diabetes control, increasing risk of hypoglycemia risk (Georges et al., 2019).

Also Smoking is a modifiable risk factor for chronic illnesses such CVD, cancer, asthma, chronic obstructive pulmonary disease, and diabetes. Smoking effects on diabetes are often underestimated. Smoking causes inflammation and oxidative stress, which directly damage beta-cell function and decreased endothelial function (Chang, 2012).

2.3.5.5. Stress

Stress is a major problem for patients with diabetes. Stress and psychological distress contribute to the development, progression, and chronicity of diabetes (Alonso-Moran et al., 2014).

Changes in blood pressure, heart rate, and cardiac output are all effects of stress- induced sympathetic activation of the autonomic nervous system, whereas activation of parasympathetic influences heart rate variability. High blood pressure increases the risk of diabetes (Hackett & Steptoe, 2017).

Moreover, Diabetes and stress are both causes and effects of one another. In other words, diabetes can be thought of as both a cause and a result of stress.

However, stress raises glucose levels and glycated hemoglobin (HbA1c), as well as diabetes and its complications can raise stress levels in patient with type 2 diabetes ,in addition it may cause other physical, behavioral, and mental disorders (Zamani-Alavijeh et al., 2018).

2.3.6. Clinical Manifestation

Type II diabetes often stays unrecognized for several years as the circulating glucose develops progressively and there are no recognizable symptoms in early stages of the disease (Vij, 2008; Hillson, 2015).

According to Awuchi et al. (2020), symptoms of type 2 diabetes can be slow for years or absent. Diabetes classical signs include:

1. Weight loss.
2. Increased hunger (polyphagia).
3. Increased thirst) polydipsia).
4. Increased urination (polyuria).

Other signs and symptoms are:

1. Vision obscured.
2. Delay wound healing.
3. Exhaustion and tiredness.
4. Multiple skin rashes in diabetes are known as diabetic dermatomes
5. Headache

2.3.7. Complications of diabetes mellitus type II

Primary complications of diabetes are damage to the eye, nerve, and kidney caused by damage to the small blood vessels. Diabetic retinopathy, caused by retinal blood vessel damage, can cause progressive vision loss and finally blindness (Awuchi et al., 2020).

A common problem of the disease, renal disease is a subset to diabetic microvascular alteration in the nephritic system. Few people with type II diabetes eventually develop ESRD. Within ten years of being diagnosed with diabetes, they may develop renal disease (Whitehouse et al., 2018; Garza et al., 2017).

Furthermore, diabetes patients have a significantly higher prevalence of coronary artery disease (CAD), peripheral vascular disease, and cerebrovascular disease than non-diabetics. Atherosclerosis, which is the primary underlying cause of all these complications and is accelerated in diabetics, increases the prevalence of macrovascular disease (Yan et al., 2015).

Estimated prevalence of 12–15% among all people with diabetes, foot ulcers are the most frequent medical complication among diabetic patients. More hospital stays are brought on by diabetic foot ulcers than by any other diabetes complication. Up to 90% of lower extremity amputations in diabetic patients result from ulcers, which can have devastating complications (Yazdanpanah et al., 2015).

However, long-term complications are more likely in all types of diabetes. These typically appear after 10 to 20 years, but they could be the first symptoms in people who had not previously been diagnosed. The possible complications of diabetes include retinopathy, neuropathy, and nephropathy. Significant long-term complications are caused by blood vessel damage. Cardiovascular diseases are two times more likely to develop in people with diabetes, and coronary artery disease accounts for about 75% of their deaths. Other macro-vascular diseases include peripheral artery disease, and stroke (Awuchi et al., 2020).

Comorbidities and complications of diabetes include high blood pressure, high cholesterol, vascular disease (including coronary artery, cerebrovascular,

and peripheral artery disease), kidney disease, eye disease, and nerve damage. Poor control of glucose, blood pressure, and cholesterol, as well as negative emotions, lead to these complication (Chew et al., 2018).

According to Baynes (2015), complications of diabetes mellitus include :

1. Acute complications

1.1. Hypoglycemia

1.2. Hyperglycemic crises

1.2.1. Diabetes Ketoacidosis (DKA)

1.2.2. Hyperglycemic hyperosmolar state (HHS)

2. Chronic complications:

2.1 Macrovascular disease complications

2.2 Microvascular complications

2.2.1. Retinopathy

2.2.2. Nephropathy

2.2.3. Neuropathy

3. Other complications and associated conditions

3.1. Impaired growth and development

3.2. Associated autoimmune conditions

3.3. Hyperthyroidism

3.4. Hypothyroidism

3.5. Celiac disease

3.6. Vitiligo

3.7. Primary adrenal insufficiency (Addison’s disease(

3.8. Lipodystrophy (lipoatrophy and lipohypertrophy(

3.9. Necrobiosis lipoidica diabeticorum

3.10. Infections seen in patients with diabetes

3.11. Non-alcoholic fatty liver disease

3.12. Limited joint mobility

3.13. Edema.

2.3.8. Assessment and Diagnostic Findings

The decision of test used to determine whether a patient has diabetes should be left up to the health care professional's assessment, who should also consider whether it would be practical to test a patient or a group of patients. The performance of diabetes testing when necessary is perhaps more important than the option of diagnostic test. There is depressing evidence suggesting that many at-risk patients still do not receive adequate testing and treatment for this disease that is becoming more prevalent or for the cardiovascular risk factors that frequently accompany it.

2.3.8.1. Fasting Plasma Glucose Level

The foundation for a laboratory diagnosis of diabetes mellitus is the measurement of blood glucose levels. A normal blood glucose level is when the glucose level is less than 100 mg/dl. If the result of a fasting blood glucose test (which can be done after an 8-hour fast) is >126 mg/dL, diabetes can be identified (Defronzo, et al., 2015).

2.3.8.2. Casual Plasma Glucose (CPG)

The accuracy of a fasting blood sugar test might be doubted on occasion. casual plasma glucose is tested regardless of the last meals eaten. If the CPG is greater than 200 mg/dL and diabetic symptoms are present, a diabetes diagnosis is confirmed (Williams and Hopper, 2015).

2.3.8.3. Oral Glucose Tolerance Test (OGTT)

The oral glucose tolerance test is another method for diagnosing diabetes. This test is used to check the patient's blood glucose at intervals after drinking a concentrated carbohydrate beverage. After 2 hours, diabetes is diagnosed when the blood glucose level is 200 mg/dL or above (Smeltzer, et al., 2010).

2.3.8.4. Glycohemoglobin test:

Also known as glycosylated hemoglobin, or HbA1c [hemoglobin A1C] is used to gather data and assess the development of diabetes control. The RBC, which has a lifespan of about three months, binds glucose in the blood to hemoglobin. It expresses the rate of plasma glucose for the previous two to three months after measuring the glucose that is bound to hemoglobin. Additionally, it helps in defining the degree of utility of the treatment plan for the patient. Normal HbA1c ranges from 4% to 6%. If the result was 6.5% or higher, the diagnoses is diabetes (Williams and Hopper, 2015).

2.3.9. Medication

The medication of DM can be shown in the table (2-2):

Medication	Action	Side effect
First-Generation Sulfonylureas Acetohexamide (Dymelor) Tolbutamide (Orinase)	Induce pancreatic beta cells to produce insulin; may enhance insulin binding to insulin receptors or increase insulin receptor.	Hypoglycemia, Weight gain, Mild GI symptoms, Skin reactions Medication interactions (warfarin, NSAIDs)
Second-Generation Sulfonylureas Glimepiride (Amaryl), Glipizide (Glucotrol), Glyburide(DiaBeta, Micronase)	Stimulate release of insulin from beta cells of the pancreas.	Hypoglycemia, dizziness, headache, nausea, nervousness, anxiety, diarrhea, tremor.
Biguanides Metformin(Glucophage)	Improve insulin sensitivity in muscle and fat; decrease hepatic gluconeogenesis and glycogenolysis.	Vomiting, loss of appetite, metallic taste, diarrhea, lactic acidosis
Alpha-Glucosidase Inhibitors Acarbose (Precose), Miglitol (Glyset)	Locally inhibit carbohydrate breakdown and glucose absorption in the small intestine.	Abdominal distention or discomfort, severe decrease of plasma glucose, diarrhea and flatulence.

Dipeptidyl Peptidase-4 (DPP-4) Inhibitor Sitagliptin (Januvia) Alogliptin (Nesina) Linagliptin (Tradjenta) Saxagliptin (Onglyza)	Inhibiting endogenous incretion breakdown improves insulin secretion and lowers glucagon secretion.	headache, cough, upper respiratory tract, Nasopharyngitis, urinary tract infection, Infections Arthralgia, back pain, weight gain and increased incidence of hypoglycemia when added to a sulfonylurea
Meglitinides Nateglinide (Starlix) Repaglinide (Prandin)	Stimulates pancreatic insulin secretion and leads to opening of calcium channels; increased calcium influx induces insulin secretion	Hypoglycemia, upper respiratory infection, dizziness, back pain, Headache, flu-like syndrome
Insulin: **Rapid-Acting** Apidra, glulisine Humalog, lispro Novolog, aspart **Short-Acting** Humulin R, Regular, Novolin R **Intermediate-Acting** Humulin N, Novolin N, NPH **Long-Acting** Lantus, Levemir, detemir	A hormone produced and secreted by the beta cells of the islet of Langerhans in the pancreas. Inhibits glycogen, fat, and protein breakdown. Increases glucose absorption by muscle and adipose tissue.	swelling, redness, and itching at the injection site, wheezing, shortness of breath, weight gain, constipation, weakness dizziness, blurred vision, sweating, fast heartbeat and muscle cramps

2.4. Self-Care for Type 2 Diabetes Mellitus

Self-care can be defined as the practice of activities that people perform independently to maintain life, health and well-being. The development of this practice is directly related to skills, limitations, values, cultural and scientific rules and the self (Gomides et al., 2013).

Self-care considered an important method to control the disease which depends on patient's readiness and interest in implementing self-care actions. These activities include, healthy eating to control the blood sugar, doing exercise, stress management, general hygiene that include personal and foot care, weight control and body safety (Mohebi et al., 2014).

Diabetic patient's self-care can help to increase information or awareness by learning to persist with the difficult nature of the diabetes in a community environment. Patient with diabetes and their families have to handle most the daily care; they can cooperate in handling the daily self-care management (Shrivastava et al., 2015).

Type II diabetes is essentially a self-managed disease, and the options patients make for themselves have an impact on their health because they are ingrained in their regular daily activities. Effective self-management requires constant individual effort and a variety of focused, difficult cognitive and behavioral tasks.

The management responsibilities include:

1. Medical management (such as administer medication, following a specific diet or exercise program)
2. Role management (making new significant behaviors or have role in life).
3. Emotional management (educating to adjust psychologically to his condition which may correct the individual’s view in the future) .

The skills needed in self-management which a person may represent on to achieve their management tasks include, problem solving, decision making, resource utilization, and activity planning (AL-Taie, 2010).

Diabetes education is essential but it must be altered to activities for the patient beneficial. Reducing the level of patient's glycosylated hemoglobin may be the final aim of self-care of diabetes. There must be an evaluation to be done to measure the changes in self-care activities like patient participation in achieving and maintaining specific glycemic targets by self-monitoring of blood glucose control. It will give information about current blood glucose condition, allowing for assessment of treatment and directing in adjusting diet, exercise and medication in order to achieve optimal glycemic control. But still recommendation should include those adults with diabetes, should continue to engage in regular physical activity (Shrivastava, et al., 2015).

The weak commitment to self-care activities for diabetic people can increase the problem. Many factors can influence the self-management of care related to personal, social, economic and cultural order, as well as parts associated to the disease treatment. Moreover, Health and nursing professionals' duty help to promote patient adherence to medical treatment by encouraging important behavioral changes to have an effective control of the disease (Neta, et al., 2014).

Nevertheless, Self-care is the cornerstone of good diabetes treatment. The ADA has identified seven important activities that have been demonstrated to be positively correlated with better health in people with diabetes. They include (Mahjouri et al., 2011) :

- Monitor of blood glucose, medication adherence,
- Being physically active ,

- Healthy eating ,
- Protect feet from injury and infection, and get medical care if indication).
- Problem-solving skill (e.g., inspecting feet and identifying foot issues early,
- Risk-reduction behaviors, and Healthy coping skills (such as practicing deep breathing) .
- The following specific self-management activities are related diabetes care and living with diabetes are: (Smallwood, 2015).
- Establish the relationships between foodstuff, activity and medications.
- Carry out self-monitoring of blood glucose, blood pressure and having retinal screening .
- weight loss, foot care, injection technique and self-monitoring activities.
- Management of acute complications (hypoglycemia and hyperglycemia).

On the other hand, diabetes treatment requires self-care in diet, exercise, medicine, glucose monitoring, and symptom management to avoid severe mortality and morbidity. Self-care behavior assessment is difficult and an important problem for clinical care and research because there are no diabetic regimens that include all of these dimensions (Weinger et al., 2005).

2.5. Type 2 Diabetes Mellitus Controlling and Management

People with type 2 diabetes mellitus have lifelong complications from the condition. Effective self-management is required for people who have type 2 diabetes. Dietary control, regular exercise, regular medication, and self-monitoring of blood glucose levels are the four basic diabetic self-management skills recommended for T2DM patients by the Global Guideline for T2DM (Yao et al., 2019).

In addition, Self-management of diabetes includes a number of lifestyle modifications, including physical activity, diet, weight loss, regular blood

glucose monitoring and adherence to medication. Diabetes complications and burden can be reduced through self-management. Diabetes patients should actively participate in self-management activities (Damayanti et al., 2018).

Lifestyle management, which includes self-management support, self-management education, and lifestyle modification, are major aspect of DM care. People must take care of themselves on the basis of deliberate action because self-care is a human regulatory function. Self-care as deliberate action is an action with a predetermined result that is preceded by investigation, reflection, and judgment to assess the circumstance and by a conscious decision regarding what should be done (Lambrinou et al., 2019).

Furthermore, Ouyang, (2007) indicated that diabetes can be prevented and treated by eating a healthy diet, exercising frequently, maintaining a normal body weight, and abstaining from tobacco use. For those who have the disease, it's important to maintain proper foot care, control blood pressure, and take care of eyes.

While Khunti et al, (2019).declared that Good adherence is related to a reduced risk of all-cause mortality and hospitalization in patients with Type 2 diabetes mellitus, making glycaemic control a crucial goal. However, many Patients with type 2 diabetes do not take their medication as prescribed and have poor outcomes. Therapeutic inertia and lack of adherence are major causes of failure to achieve goals.

Nevertheless, diabetes Control and Complications Trail (DCCT) showed that the long-term complications of diabetes such as retinopathy, nephropathy and neuropathy can be decreased by as much as 50% to 70% with intensive glycemic control when compared to more conventional therapy. However, comprehensive patient education is required to provide the patient with the self-

care skills that are necessary to achieve such as level of glycemic control. In the United States, only about 35% of individuals with diabetes have attended a diabetes class or education program and only about 33% check their blood sugars on a regular basis (Ouyang, 2007).

2.5.1. Healthy Eating

According to nutritionists, diet is crucial in the management of diabetes, including both the types and quantity of foods which affect blood sugar levels. Meal should be taken at regular intervals with low fat, high fiber, and restricted carbohydrate content (Sami et al., 2017).

Healthy eating patterns like the DASH diet and the Mediterranean diet are typically advised, but there isn't any evidence to suggest that one is better than the other according to the ADA, people with diabetes type 2 who are unable to attain the glycemic target or where decreasing anti-glycemic medication is a priority may benefit from very-low or low-carbohydrate diets, as they have the most evidence for glycemic improvement. For overweight individuals with diabetes type 2, a diet that achieves loss of weight is effective (Awuchi et al., 2020).

In addition , Healthy eating affects weight and metabolic rate is important for diabetes health care behavior. Low-carbohydrate diets are not widely applicable or well-tolerated by patients, as evidenced by the lack of compliance seen in trial settings. In TIIDM, whether managed by diet, pills, insulin, or a combination of the three, six months of low carbohydrate diets containing as few as 50-120 g/day appears safe. Patients who follow a low-carbohydrate diet are unlikely to require oral hypoglycemic medications or insulin injections. Dietary options for weight loss that improve glycemic control can be offered to people with TIIDM, such as simple caloric restriction, low fat intake, and the

use of carbohydrates with a low glycemic index (Scottish Intercollegiate Guidelines Network, 2014).

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Carbohydrates effect insulin more than fat or protein. High insulin levels decrease satiety, influence eating behavior, and down regulation lipolysis. Figure -2 shows how carbohydrate reduction helps lower insulin resistance. Patients with higher insulin levels benefit more from carbohydrate restriction. Insulin affects the "set point" of eating behavior and body weight regulation, similar medication therapy and surgery but not calorie restriction alone. Therapeutic ketosis is being studied for its ability to reduce hunger and appetite surges caused by dietary restriction (Kelly et al., 2020).

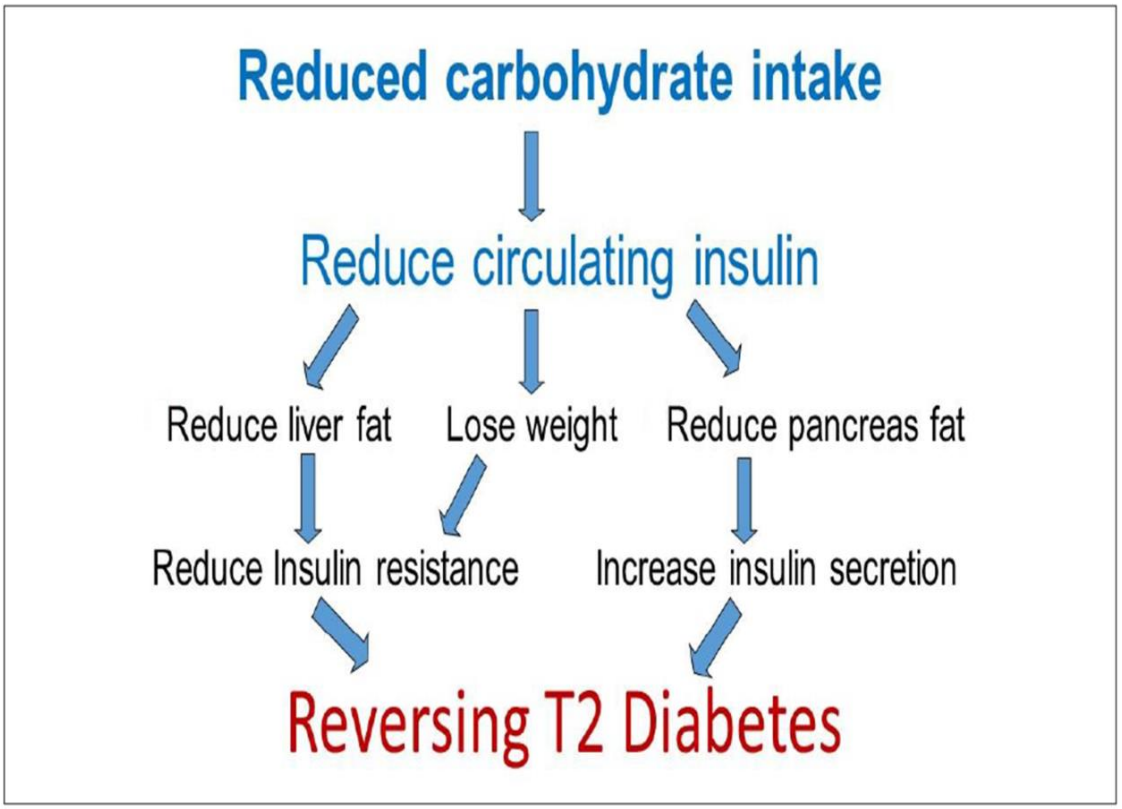

Figure 2-2: A model that describes the process by which lowering total energy and carbohydrate consumption may reverse the pathogenesis of diabetes type 2. Following a very low-calorie diet, type 2 diabetes remits in 46% of patients after one year, according to the diabetes remission clinical trial (Kelly et al., 2020)

Patient with TIIDM advised to eat not too much sugar, few fatty foods, and plenty of fruit and vegetables. Calorie restriction is essential for patients with TIIDM. This restriction must continue and of long duration to make an impact on body weight. Patient must avoiding excessive alcohol consumption as part of calorie restriction (Taylor and Batey, 2012).

Moreover, Awuchi et al., (2020) illustrated that a low-carbohydrate diet can help reduce the amount of glucose the body is exposed to, resulting to benefits in the areas of weight loss, decreased obesity risk, and improved control of diabetes and other metabolic disorders. Low-carbohydrate diets include less

than 20% carbohydrate, according to the American Academy of Family Physicians.

Therefore, A good diet, regular exercise, and a normal weight can usually delay or prevent type 2 diabetes, which represents for 85–90% of all cases globally. Higher levels of exercise (more than 90 minutes per day) reduce the risk of diabetes to 28% (Ouyang, 2007).

2.5.2. Physical Activity or Exercise

Exercise plays essential role in diabetes control. Physical activity reduces cardiovascular risk, improves glycemic management, helps weight loss, and improves health. Regular physical activity for 8 weeks' period can lower HbA1C in people with TIIDM, better than those with type I diabetes.. It can improve health condition like increased muscle strength, cardiovascular fitness and insulin sensitivity. In the absence of contraindications, older people with diabetes type II should do resistance exercise three times per week (Gesare et al.,2014; Cefalu, 2015).

Exercise is another behavioral predictor of improved life quality in people with diabetes, as it is related with lower hyperinsulinemia, increased insulin sensitivity, lower body fat, lower blood pressure, and better lipid profiles in both type I and type I I diabetes (Ouyang, 2007)

Moreover, regular exercise is an important factor in the prevention and treatment of diabetes type 2. Previous studies have shown that people of any age can benefit from regular physical activity and a reduction in body mass. According to World Health Organization guidelines, all healthy adults should engage in at least 150 minutes of moderate-intensity aerobic exercise or at least 75 minutes of intense aerobic exercise every week. Regular physical activities decrease the risk of type 2 diabetes (Klimek et al., 2019).

Physical activity refers to any type of movement that uses more energy, whereas exercise refers specifically to such planned and structured activity. Exercising helps people with type 2 diabetes maintain a healthy weight, improves their cardiovascular health, and improves their well-being. Type 2 diabetes mellitus may be prevented or delayed if regular exercise is followed (Colberg et al., 2016) .

Albikawi and Abuadas, (2015) stated that physical activity is essential for both physiological and psychological health. To increase patients' optimism and self-confidence, activity must be increased; therefore, now is the time to help patients with diabetes mellitus in discovering and converting the feeling that comes with exercise into internal gain.

On the other hand, regular exercise is related with diminishing the risk of developing type 2 diabetes. People with TIIDM should be advised to be involved in physical activity or structured exercise to get better glycemic control and reduce risk factors for cardiovascular (Scottish Intercollegiate Guidelines Network, 2014).

Taylor and Batry, (2012) mentioned that Individuals are encouraged to walk rather than driving or taking the bus, to use the stairs rather than the lift, and to engage in recreational activities. In addition, physical activity is recommended for two reasons: For starters, it will help with energy balance. People gain weight when they consume more calories than they burn in their daily lives. Second, people with TIIDM are more prone to heart attacks and CVA, which can be reduced with regular exercise.

The International Diabetes Federation (2012) recommended practicing physical activity or exercise or because it is considered important part components for preventing and managing in typing 2 diabetes. Although, the

word exercise or physical activity are utilized interchangeably on time, physical activity be known at the same time as the movement of the body trigger through skeletal muscle contractions have been occurring in substantial increase within power spending whereas exercise is known the same as a physical activity part have carried out with the goal to improve physical health (Gabish & Mohammed, 2018).

According to Gabish & Mohammed, (2018), confirmed that individuals who have type 2 diabetes patients that perform together aerobic and resistance training had recommended a lower within glycated hemoglobin, blood pressure, lipid profile and obesity. This study had informed this exercise for 150 minutes weekly have resulted in controlling of HA1C and different cardiovascular risk factors diseases within type 2 diabetic patients.

2.5.3. Self-Monitoring of Blood Glucose

Diabetics need self-monitor their blood glucose levels to determine if their treatment is effective and if their glycemic targets are being reached. It may also be used to avoid hypoglycemia and insulin dosages after meals, adjust medicines, medical nutrition treatment, and physical activity (Gesare et al., 2014).

Self-monitoring blood glucose (SMBG) aims to keep blood glucose levels as close to normal as possible in order to prevented long-term complications, to make appropriate decisions regarding exercise, diet, and medication, to assess the effects of these decisions, and to detect hyperglycemia and hypoglycemia (Hortensius et al., 2012).

While, Weinstock, (2019) indicated that Self-monitoring of blood glucose levels is important for people who have Type 2 diabetes mellitus who use insulin or other medication that can cause hypoglycemia. The healthcare

provider can assist the patient to identify the frequency of blood glucose monitoring based on the patient's condition (Weinstock, 2019).

Therefore, it is obvious that good glycemic control is one of the most important aspects in avoiding and delayed diabetes-related problems. This needs thorough education, active self-monitoring, effective lifestyle modifications, and a therapeutic plan (Muralidharan et al., 2017).

Whereas Svartholm and Nylander, (2010) confirmed that Self-monitoring of blood glucose levels is essential to improving the effectiveness and safety of treatment for TIIDM patients receiving insulin. Blood glucose levels should be checked at least four times per day, before each meal and at bedtime. By doing so, the patient's glucose levels can be controlled and hypoglycemia will be prevented.

Nevertheless, Diabetes patients have found that self-blood glucose monitoring is important because it enables them to monitor their glycemic targets and assess how well their treatment is working. Additionally, it aids in the management of medications, postprandial insulin dosages, medical nutrition therapy, and physical activity. Hypoglycemia is prevented. The best timing and frequency for patients with type II diabetes receiving non-insulin therapy to check their blood sugar levels have remained debatable (Farmer et al., 2007).

Kirk & Stegner, (2010) stated that self-monitoring of blood glucose levels by patients is an essential component of intense glycemic therapy and is commonly regarded to enhance blood glucose control and health outcomes. In furthermore, the United Kingdom Prospective Diabetes Study found that a decrease in HbA1c was associated with a reduced risk of microvascular problems in people with T2DM.

2.5.4. Medication Management

Pharmacologic therapy for patient diabetes type 2 can help with good control by normalizing A1C with insulin and lowering A1C by 0.5 to 2% with oral diabetes medication. Despite the benefits of pharmacotherapy, medication adherence has been reported to be poor, ranging from 36 to 85% for oral medications (Gesare, et al., 2014) .

On the other hand, if treatment of diabetic patient with oral antidiabetic agent cannot control of the high blood glucose then insulin should be used in a combination with oral therapy to decrease the danger of hypoglycemia and weight gain (Svartholm and Nylander, 2010).

Effective management of type 2 diabetes requires the performance of several complex self-care behaviors including both lifestyle change (i.e. regular exercise and dietary control), and medical self-care (such as medication use, glucose testing, recording blood glucose levels and foot care. Although dietary therapy is importance of diabetes care, diet has been identified by many patients as one of the most challenging aspects in management their diabetes (Ouyang, 2007).

2.5.5. Stress Management

Stress is a factor in everyone's life including the diabetic patients. Stress management help to learn relaxing techniques to lower the amount of stress in their life for better health. Diabetic patients must learn yoga, meditation, and deep breathing to help in stress management (Abbas, 2013).

Techniques for stress management may help patients in managing their blood glucose levels, which may help them to avoid long-term complications associated with diabetes such diabetic foot ulcers and blindness. It was demonstrated that stress training program helped diabetic women control their

blood glucose levels while reducing their levels of stress, anxiety, and depression (Hamid, 2011).

Stress is an integral part of modern day life. Stressors can be internal and external. The body reacts to stress by fight or flight reaction and recurrent stress may cause unsuccessful regulator occurrence of hypothalamus leading to less effective hormonal dominance through feedbacks. This may cause many alterations in different functioning parts of the body which cause different diseases. Like risk of DM with stress, the results are worse than expected, but differences remain personal because of the different behavior (Abbas, 2013).

Social support is considered as a facilitator of healthy conduct in social psychology. Social support has been shown to be useful in physiological, social, and psychological adaptability, as well as stress and depression reduction in chronic conditions. As a result, social support and self-efficacy in people with T2DM are associated with self-care behavior adherence as well as diabetic adaption (Gao et al., 2013).

2.5.6. Personal Hygiene

Diabetes patients are at risk to infection. Skin is less effective as a first line of defense. Uncontrolled diabetes leads to loss of fat deposits under the skin, glycogen reduction, and proteins damage in the body. Losing Protein may impede inflammatory and healing response, weaken WBC function and migration of WBC to infection site (Al Ebrahimy, 2003).

Abbas, (2013) added that body hygiene requires more than just being uncontaminated. It involves several skills that aid individuals to live well. Patients must be alert of the harm which can happen, and apply simple practices e.g. hand washing frequently can assist in avoiding or preventing in some occasion fatal diseases from spreading.

In addition, bacterial killing and phagocytosis are included in fighting infection. Reduced blood supply to certain parts of the body can interrupt healing. The skin must remain clean from pathogenic bacteria as needed. Frequently, contamination can be happen in warm and moist areas that help in organism's growth in specific areas in the body e.g. (between the toes, under the axilla and breast, and groin) (Oleiwi, 2012; Abbas, 2013).

2.5.7. Foot Care

Complications related to diabetes in the foot, which may be more common in the elderly, can reduce by enhance people's quality of life. The risk of foot complications can be reduced by preventative measures such as hygiene, daily examination of feet, medical attention, and used of appropriate footwear (Matricciani & Jones, 2015).

Therefore, diabetes causes a lot of difficulties, so diabetic individuals need to take care of their feet. They are more prone to neurovascular disease, which can lead to impaired circulation, loss of protective sensation in the feet, and slow healing of wounds on the feet. Each of these situations contributes to the rise in amputation rates. Even in the absence of nerve and vascular signs, a patient's feet could still be at risk (Tomar and Lester, 2000).

According to (WHO) standards, diabetic foot is an infection with tissue destruction, or ulceration that is associated by neurological abnormalities and peripheral vascular disease in the lower extremities. Additionally, it is regarded as a major problem in chronic disorders that change protein, fat, and carbohydrate metabolism as a result of an endocrine disorder or a relative or complete lack of insulin (Al Ebrahimy, 2003).

Diabetes foot ulcers result from improper footwear. Routine examining shoes for any pieces, unusual objects, or linings is important. Patients should be

informed about appropriate footwear, diabetes patients needing to pay attention to the size and type of their shoes and avoiding pointed-toe and open-toe shoes, high heels, and sandals. Patient should examine footwear material and structure. More than 50% of these amputations and diabetic foot complications can be avoided by educating patients' daily self-management skills and this can be done every day (Mohammed-Ali & Hamza, 2016).

Pourkazemi et al.,(2020).confirmed that diabetic foot complications and amputation can be avoided with Good knowledge and practice toward diabetic foot care. American Diabetes Association recommends annual knowledge, skills, and behavior assessments for diabetic.

Patients who have diabetes should be advised against walking barefoot on sand or water, using natural ointment on feet to prevent skin from drying, cracking, and remembering not to apply between toes, and using mild foot powder on the soles of their feet to avoid blisters and other skin irritations (Oleiwi, 2013).

In addition, patients should carefully dry their feet, especially between their toes, and not wear new shoes for more than an hour to avoid injuries. The best time to trim nails is after a shower. Toenails should be clipped evenly and straight, without cutting the corners (Abbas, 2013).

A group of symptoms associated with diabetic foot might lead to tissue destruction. Neuropathy and ischemia are TIIDM symptoms that enhance the risk of infection in TIIDM patients. About 50-70% of TIIDM patients have a lower extremity amputation that begins with an ulcer. The prevalence of diabetic foot ulcers is 4.6%, sensory neuropathy is 14.9%, lower extremity ischemia is 7.5%, and amputation is 1.7%. Foot ulcers were mostly related with male

gender, neuropathy, and a longer duration of diabetes (Albikawi and Abuadas, 2015) .

If necessary, the patient should cut his or her own nails. They must straighten the nails and file the edges. It should not be too long, as this might cause wounds, nor too short, as this can cause the nail to grow inwards. If they develop calluses or corns, they must seek expert assistance. Diabetics must change their socks on a daily basis to dry and clean socks that fit properly. The feet must be kept warm at night, and socks may be an option if they are cold. During the winter and on rainy days, it is vital to wear socks and shoes. Before putting on their shoes, the patient should inspect them to see if there are any defect (Svartholm and Nylander, 2010).

Prevention and caregivers education for the patient, blood glucose control, wound cleaning, infection control, revascularization, off-loading of the ulcer, and reconstructive surgery if required are all part of the gold standard for diabetic foot therapy. Hyperbaric oxygen treatment may also be helpful (Khan et al., 2017).

2.5.8. Maintain a Healthy Weight

The problem of overweight in TIIDM is common. Over 80% of people with TIIDM are obese, some of them at the diagnosis. Weight gain is not only undesirable, but it also considered an essential medical problem that can become a barrier to the positive management of glycemic control. So far, most hypoglycemia medication worsens overweight (Jones and Khan, 2007).

Clinically significant decrease in blood glucose, HbA1c, and triglycerides are produced by lifestyle modifications that lead to modest and long-term weight loss. Even greater advantages result from additional weight loss, such as lower blood pressure, improve of low-density lipoprotein (LDL) and high-density

lipoprotein (HDL) cholesterol, and less need for medication to regulate blood sugar, blood pressure, and lipids (American Diabetes Association , 2016).

Oleiwi, (2012). Reported that Insulin resistance happens due to overweight, when the body does not use insulin well. Even a weight loss of (5 - 10) kilograms can improve blood sugar control but it will also lower blood pressure. After weight loss, patient may need less diabetes medications.

Therefore, weight management is a vital part for diabetic patient with (BMI >30 kg/m2). Decrease weight in obese persons has been related with decreases in mortality, blood pressure, lipid profiles, arthritis-related disability and other consequences (Norris, et al., 2011.(

Weight loss can reduce the risk of cardiovascular disease, result in a partial recovery in people with diabetes, or prevent the progression of prediabetes into type 2 diabetes. There is no one diet that is best for everyone with diabetes (Ouyang, 2007).

2.5.9. Body safety

Diabetics' patient when they want to apply the physical safety should recognize the most important reasons that make it exposed to situations of dangerous (to avoid falling, accidents, injuries, etc.). The disease will affect the balance of the patient, so they need to learn and practice sport balance to avoid falls associated with injury and loss of consciousness (Powell, et al., 2005).

Diabetic patient must identifying hyperglycemia and hypoglycemia in order to protect himself from the risk of complications. Hyperglycemia has an impact on the perception and activities which are necessary as in hypoglycemia. It affects the majority of patients with diabetes who are unable to reach therapeutic goals. Blood sugar self-monitoring detection of body signals and interventions should be prepared toward prevention disabling hypoglycemia and

undesirable hyperglycemia. With long period, chronic hyperglycemia is a risk for cognitive decline. Acute and frequent hyperglycemia, over 15 mm/L can also lead to have an impact on cognitive motor tasks. Maintaining blood sugar to avoid hyperglycemia in diabetic workers will help to improve safety in the life activities, As well as to avoid falling and fainting (Lee, et al., 2011; Toh, et al., 2011).

Also Diabetic patient ordered to maintain the safety of himself by keeping something sweet with him at all times to treat hypoglycemia, if the patients are able to check their blood glucose level or when the patient feel signs of hypoglycemia, he should always keep with him sugar cubes or 1 tablespoon honey or syrup, 4-7 small pieces of candy, and 1/2 cup fruit juice, then the blood sugar can be checked again (Oleiwi, 2012).

2.5.10. Education

Diabetes self-care education can be defined as continuous practice for teaching and training simplify skills, knowledge and capability significant for management of diabetes self-care. Evidence based knowledge have used headed for guide diabetics to integrate their requires, expectation and experience in this course of action for caring. Empower patients with decision making tools are the main goals of the education in addition to trouble solving skills toward reinforce cooperation by the diabetes managing group to gain optimistic clinical outcome, enhanced quality of life with health status (Funnell et al., 2012).

The goals of diabetes mellitus managing are keeping plasma glucose level within normal range, arrival to normal metabolic functions of patients within diabetic, maintenance plasma glucose range within normal level and to decrease predisposing factors of diabetes mellitus - associated complications. It is as well intended to delegate clients for managing diabetes self-care skills and to return

clients with diabetic to normal lifestyles dependent on better healthy conditions (Akanji, 2013.)

Self-care education programs reduce the risk of type 2 diabetes mellitus complications and increase patients' self-management, self-efficacy, and quality of life (Syikir & Irwan, 2020).

Type 2 diabetes mellitus patients require self-care education programs to change lifestyles (diet, exercise and self-monitoring). To achieve glycemic control, patients must manage their conditions (Shrivastava et al., 2013).

2.5.11. Smoking Cessation

The Korean Diabetes Association recommends smoking cessation to reduce diabetes-related cardiovascular problems. Many studies had indicated that smoking has negative effects on diabetes mellitus, including diabetic macrovascular complications, but the direct relationship between smoking and diabetes and the evolution of diabetic micro vascular problems is unknown (Chang, 2012).

The risk of developing diabetes type 2 can be reduced by smoking cessation alone. Smoking cessation is strongly recommended in patients with diabetes to improve health outcomes in clinical guidelines for the management of diabetes, including the American Diabetes Association's and the National Institute for Health and Care Excellence guidelines (Cho et al., 2018).

Results from the Nurses' Health Study and the Health Professionals Follow-Up Study analyzed by Liu and colleagues showed that in former smokers with type 2 diabetes, the risk of cardiovascular disease and mortality was reduced after smoking was stopped but only if the person did not gain weight as a result. Gaining weight after quitting smoking is associated with a

lower risk of death from cardiovascular disease in people with type 2 diabetes (Stower, 2020).

2.6. Previous Studies Related to the Patients self-care

A study was carried out by **(Abed and Jassim, 2021)** to evaluate (Effectiveness of a Coping Style- related Instructional program on Self - Care of Patients with Diabetes Mellitus Type II at Endocrinology and Diabetes Center in Al-Basra City). Descriptive analytic (quasi – experimental) design. Sample composed of (60) patients were divided into two groups study and control group, (30) patients in each one. The self-report questionnaire was containing three parts which are: part I consist of demographic data, part II consists of clinical data, and part III consists of three domains (1) Michigan Diabetes Knowledge Questionnaire True/ False/, (2) Summary of Diabetes Self Care Activities Scale Expanded Version. And (3) Diabetes Coping Measure Scale. The researcher evaluate effectiveness of program by applying pre-test and post-test, the instructional program consist of three sessions was given. After that applying the post-test. The data were analyzed by using two statistical approaches: Descriptive and Inferential statistics. The study findings Showed s that participants' age group at a level (46-65 years) were (67.7%) of the study group, and (56.7%) of the control group. (56.7%) of the study group were male, while (53.3%) of the control groups were female. The study also confirmed that the effectiveness of a Coping style related instructional program on Self - Care of Patients with Diabetes Mellitus Type II at Endocrinology and Diabetes Center in Al-Basra City.

A study was carried out by **(Gabish, 2018)**, to assess the effectiveness of educational program on improving diabetic foot self-efficacy concerning managing their feet. A descriptive analytic (quasi – experimental) design study was carried out at Diabetic and Endocrinology Center in Baghdad- Rusafa

Sector from 2 nd of May 2017, to27th June 2018. Non-probability sample of (80) male and female diabetic patients were selected. The study instruments consisted of two major parts: first part related to sociodemographic characteristic and the second part is related to diabetic foot self-efficacy. The researcher examined the patients' self-efficacy by introducing the pre-test then, the teaching program of three lectures was given. one – hour lecture was given. Afterward, the post-test. The data were analyzed by using two statistical approaches: Descriptive and Inferential statistics. The study revealed that the diabetic foot self-efficacy regarding foot self-care was 60.0% (acceptable) for the post-test as opposed to the pre-test which was 37.5% (weak). Recommendation: The study recommended that type 2 diabetic patients should be encouraged to attend specific educational programs and workshops concerning diabetic foot self-care and effect of self-care to improve self-confidence

Taha et al., (2016) conducted a study at Zagazig University Hospital in Egypt (Impact of a health educational guidelines on the knowledge, self-management practice and self-efficacy of patients with type-2 diabetes), Diabetes is a common costly condition associated with significant morbidity and mortality. The process of teaching individuals to manage their diabetes had been considered an important part of the clinical management. The goals of self-management education are to optimize metabolic control, prevent acute and chronic complications, and optimize quality of life; To evaluate the impact of a health education intervention guidelines for T2DM on Patients' knowledge, self-efficacy, and self-management practices. Methods: Design: quasi-experimental uncontrolled design on 50 patients evaluated at pre-intervention, post-intervention, and 6-month follow-up. The study was carried out in the outpatient clinics of Endocrinology and Metabolism at Zagazig University Hospital. Tools: three tools were used, 1st tool was an interview questionnaire to assess socio-

demographic data and patients' knowledge, self-efficacy scale and patients' self-reported self-management behaviors concerning self-care practices. There were statistically significant improvements in patients' knowledge ($p < .001$), self-efficacy ($p < .001$), and self-management ($p < .001$), which continued through follow-up. Multivariate analysis showed that the knowledge and self-efficacy scores positively predicted the scores of self-management. Conclusions: The study demonstrates the effectiveness of health educational intervention guidelines in improving T2DM patients' self-management behaviors and self-care practices through provision of sound information and fostering their self-efficacy. The slight decline at the follow-up phase indicates the need for periodic booster doses of the intervention. Therefore, the study recommends generalization of such educational guidelines in all health care settings providing services to T2DM patients. Such guidelines should particularly address the patients with low educational attainments, long history of T2DM, and those residing in rural areas. More research is needed to investigate the long-term effect of such educational interventions.

Chaurasia et al., (2015), entitled a self-care management awareness study among diabetes mellitus patients in rural Nepal. Study aimed to determine the self-care management of diabetes mellitus among a convenience sample of 192 diabetics. A structured validated questionnaire was administered during community diagnostic program in March 2014. The mean self-care knowledge score of 192 patients (18 years) was 5.406 ± 1.709. Among them, 61 (31.77%) had poor knowledge of diabetes mellitus, 110 (57.29%) had moderate knowledge, and 21 (10.93%) had good knowledge. Most people who had diabetes knew self-care reduces complications. The majority of them engaged in self-care (physical activity, hand and foot care, general health check-up) They found that more than two-thirds of the participants had uncontrolled blood sugar.

Albikawi and Abuadas (2015) studied diabetes self-care management behaviors among jordanian type II diabetes patients. This study aimed to assess the status of diabetic self-care management behaviors in Jordanian patients with TIIDM and their connection to demographic variables. This study used a descriptive correlational design and a convenience sample of 149 Jordanian patients with TIIDM who were being treated at the Specialized Diabetes Center in Amman, Jordan. Medication taking was the most commonly performed self-care management behaviour, followed by foot care, food adherence, and exercising, and blood glucose monitoring was the least frequently completed behaviour. Diabetes self-care behaviours were discovered to be related to age, gender, degree of education, and length of diagnosis. The findings of this study can help health providers be trained to give suitable self-care management interventions that may improve self-care management habits in diabetic patients.

Rajasekharan, et al., (2015) conducted a study entitled self-care activities of diabetic patients attending a Tertiary Hospital in Mangalore, Karnataka, India. The purpose of this study was to investigate the self care activities of diabetics attending a tertiary care hospital in Mangalore. In Mangalore's Government Wenlock Hospital, a facility-based cross-sectional study was conducted. After receiving their agreement, a summary diabetes self-care activities questionnaire was administered to a total of 290 individuals with diabetes lasting more than one year. The statistical study was conducted using descriptive statistics and the relationship between variables. Findings indicate that 45.9% of the individuals adhered to a healthy eating plan on a daily basis, 43.4% performed in 30 minutes of daily exercise, and 76.0% monitored their blood sugar regularly. Regarding adherence to oral hypoglycemic medicines and insulin, 60.5% of patients were daily adherent to medication and 66.9% were daily adherent to insulin injections. Conclusions of study Self-care was inadequate except for blood sugar monitoring and drug adherence. As these

practices are critical for preventing problems and improving quality of life, greater efforts should be made to educate diabetics.

2.6.1. Summary of previous disease

Using previous studies provides the researcher with important information and a general idea about the topic he intends to study, and thus helps the researcher not to make the mistakes that other researchers have made. Previous studies provide the researcher with a large amount of important information, which saves him effort and time. Previous studies provide a large amount of references and sources that the researcher can use. Reviewing previous studies will give the researcher the opportunity to learn about the best methods used in this topic, and thus will facilitate the task of choosing the appropriate research method. Previous studies enhance the value and credibility of scientific research, and provide the researcher with a good basis and important information for his research. Reviewing previous studies helps the researcher know the areas in which other researchers have researched and the results they have reached in his field of study, and thus will avoid repeating information or researching a problem or issue that has been answered. Including previous studies in scientific research will provide justification for the research; Because it will define its goal and emphasize its importance and the reason for the need for further research and analysis on the topic under study.

Chapter Three
Methodology

Chapter Three

Methodology

In this chapter, the researcher outlines the study methods, including the study design, administrative arrangements, ethical issues, study setting, study sample, and program. The study design, research instrument, pilot study, data collecting, data analysis, and limitations will be discussed.

3.1. The Study design:

Quasi-experimental design with the use of pretest- posttest approach for two groups of the samples (study and control) was conducted to determine (Effectiveness of Self-Care Instructional Program for Adult Patients on Controlling Type II Diabetes Mellitus in Al- Diwaniyah Teaching Hospital) from the period of 15th July, 2022 to 17th May, 2023.

3.2 Administrative Agreements:

For obtaining administrative and formal permission the following steps took place:

1. Protocol paper was filled as a first step to obtain formal approval of the study by the Scientific Committee of Adult Nursing Department- College of Nursing- University of Babylon.
2. A study proposal, title, objectives and importance, were presented in special seminar which carried out by the Scientific Postgraduate Committee - University of Babylon - College of Nursing in order to obtain formal agreement to start the study.
3. After obtaining agreement from of the AL- Diwaniyah Health Director and then obtaining agreement from Training and Development Department- An official permission is obtaining from AL- Diwaniyah Teaching Hospital /

Endocrine and Diabetes Center as a proper setting to facilitate data collection (Appendix A1, A2, A3, and A4).

3.3. Ethical Consideration

Respect for values and self-respect is one of the fundamental data collection principles. The University of Babylon - Faculty of Nursing Ethics Committee granted this approval (Appendix A1).

After explaining the study goal to each participant, the researcher assured them that their personal information would be kept private and that their regular visits and care would not be interrupted in any way by their participation in the study. In addition to the subsequently, the researcher also informed each participant that their participation is completely voluntary and that they are free to leave at any moment, whether or not the interview was finished. After obtaining verbal consent from the patients, face-to-face interviews were used to collect data, while height and weight were measured by the researcher.

3.4. Setting of the Study:

The study was done in the Endocrine and Diabetes Center in AL-Diwaniyah Teaching Hospital. The center provides services for diabetes patients such as treatments (tablets and insulin) and also teaches diabetic patients how to maintain a healthy lifestyle.

These are the reasons why the researcher selected this hospital:-

1. This hospital is the only specialist teaching Hospital in Al-Diwaniyah City that treats diabetes patients.

2. To obtain a large number of patients within a short period of time so as to effectively reach the target population.

3. The staff was extremely cooperative throughout the program's implementation.

3.5. The Study Sample:

Non-probability (purposive) sample drawn from the target population who satisfied particular requirements over a set period of time. (10) patients were chosen to evaluate the patient's requirements for this program, and another (10) individuals were chosen to participate in the pilot study, while (60) patients with Diabetic millets type II having the same inclusion criteria are were divided into two groups: (30) patients act as study group (17) females and (13) males, and the other (30) patients were treated as control group (16) females and (14) males, who scheduled for frequent visits to the center for treatment and consultation. According to the specific characteristics that delimit the study sample through the eligibility criteria

3.5.1. Inclusion Criteria

The study samples subjects are were selected as follows:

1. Adult patient's between18 to 60 years age group.
2. Patients should have one or more year of affect with diabetes millets type II.
3. Patients have to be able to communicate and have fully consciousness.
4. Patients who scored less than 60% in the pre-test in the study group were chosen.
5. Patients should live in the Al Diwaniyah governate.

3.5.2 Exclusion Criteria

The study excludes patients:

1. Newly diagnosed patients with type II diabetes mellitus.
2. Refused to participate and adhere to the schedule of the program.

3. Those suffering from any psychological illness or unable to care for themselves.

3.6. Steps of the Study:

The study objectives was to evaluate the effectiveness instructional program on self-care for patients with diabetes mellitus type II at the endocrine and diabetes center in Al- Diwaniyah City, the researcher conducted the following steps:

3.6.1 Assessing the Needs of Patients Concerning Self-Care Diabetes Mellitus Type II:

Before starting the instructional program, the initial assessment was conducted, which aims to assess patients' self-care activities and their knowledge. The questionnaire of the initial assessment prepared by the researcher is based on the review of relevant literature and experiences of the researcher. The researcher used a close-ended questionnaire format answers (yes / no).

The sample consists of (10) patients who were admitted to the Endocrine and Diabetes Center in AL- Diwaniyah city. The questionnaire of the initial assessment is composed of (10) items concerning diabetes self-care. Each patient requires (10-20) minutes to answer the questions.

The majority of patients, according to the findings of the initial assessment, indicated signs of a knowledge deficit. The result showed that (76%) of the sample recorded poor knowledge related to diabetic self –care (Appendix B).

This outcome has clarified the need to develop an instructional program for diabetic patients to enhance their knowledge and self-care about T2DM.

3.6.2 Construction of self-care instructional program:

The program was designed and developed according to the American Diabetes Association (ADA) and International Federal Diabetes (IDF), as well as the results of a preliminary test evaluation of a measurement for diabetes patient knowledge about self-care. It contains related components with the aimed of the study to improve the level of knowledge and the performance of self-care.

After completing all sessions of the study instructional program, the researcher offered the program to a group of experts for assessing its scientific content and experts marked their notes and suggestions on some points to make it better as possible and to meet the needs of the participants and the aims of the study. Through period 1/7/2022-15/8/2022.

The instructional program was designed to provide the patients' knowledge and improve self-care including information about diabetes mellitus type II (definition, clinical manifestation, risk factors, causes, complications, and diagnosis, medication adherence, a healthy lifestyle, self-care and controlling for patients with T2DM) (Appendix D).

Sessions of the Instructional Program

1- The first session:

Topic: Introduction about diabetes mellitus type II

Objective: The program aims to increase the knowledge of patients about

Diabetes mellitus type II.

Contents:

- Definition of diabetes mellitus.
- Definition type II diabetes mellitus.
- Risk factor of type II diabetes mellitus.
- Signs and symptoms of type II diabetes mellitus.
- Diagnosis of type II diabetes mellitus.
- Complications of type II diabetes mellitus.

Place of lecture: At classroom in the Endocrine and Diabetes Center in Al-Diwaniyah City

Time of lecture: 45 minutes

Learning devices that are used in all sessions are:

A. Lecture with discussion.

B. Computer.

C. Booklet at end of the program.

2. The second session:

Topic: Self- Care for DM type II.

Objectives: The program aims to increase the knowledge of patients about the self- care and medication of DM type II.

Contents:

- Diabetes Self Care
- Dietary planning.
- exercise and daily life activities
- Medication
- Self- Monitoring blood glucose

Place of lecture: At classroom in the Endocrine and Diabetes Center in Al-Diwaniyah City.

Time of lecture: 45 minutes

Learning devices that are used in all sessions are:

A. Lecture with discussion.

B. Computer.

C. Poster with pictures.

D. The booklet at the finish of the program.

3. **The third session:**

Topic: Controlling and management DM type II

Objectives: The program aims to increase the knowledge of patients with

DM type II about self-care and prevent complications.

Contents:

- The relationship among self-management, diabetes, and health.
- Stress management
- Prevention diabetic foot
- Eye care

Place of lecture: At classroom in the Endocrine and Diabetes Center in Al-Diwaniyah City.

Time of lecture: 45 minute

Learning devices that are used in all sessions are:

A. Lecture with discussion.

B. Computer.

C. Booklet at the end of the program.

3.6.3. Implementation of the instructional Program

The instructional program was implemented to the study sample at the classroom in the Endocrine and Diabetes Center at AL- Diwaniyah Teaching Hospital throughout three lectures.

Each lecture took approximately (45) minutes. The presentation was used through introducing, discussion, the laptop is used for presentation the lecture pictures, and video as educational methods for participants (Appendix G).

3.6.4. Evaluation phase:

Each participant was tested three times using the same data collecting instruments. This was performed during the period of recruiting (pretest), immediately following the end of the recommendations for the instructional program (posttest 1), and again after one month (posttest 2) as follow-up**.**

3. 7. Instrument of the study:

For the purpose of evaluating effectiveness of self-care instructional program for adult patients on controlling type II diabetes mellitus in Al-Diwaniyah Teaching Hospital, the researcher used Diabetes self-care scale (DSCS) the study instrument to attain to the objectives of the study. The study instrument consists of three parts (Appendix C1-C2), including the following

Part I: Patients Socio-Demographic Characteristics:

The first part of the questionnaire concerned with the collection demographic data of the patients that includes (7) items related to the patients, who treated in the Endocrine and Diabetes Center in AL- Diwaniyah Teaching

Hospital that included: age, gender, educational level, marital status, monthly income, occupation status, and residency (Appendix C1,C2).

Part II: Clinical Characteristic of Patients with DM type II:

The second part of the questionnaire sheet was consisted of (7) items that concerned with smoking status, duration of diagnosis, type of treatment, previously received an education about diabetes self-care, family diabetes history, have DM complications, and body max index.

Body mass Index (BMI) was calculated by using the formula:

$$BMI = \frac{body\ weight(kg)}{height(m)^2}$$

Based on BMI, patients were classified in to five groups:

- Underweight (BMI≤18.4 kg/m^2)
- Normal (18.5 to 24.9kg/m^2)
- Overweight (25 to 29.9 kg/m^2)
- Obese (30 to 34.9 kg/m^2)
- Severely obese (BMI≥35 kg/m^2)

Part III: Diabetes self-care scale (DSCS):

The Diabetes Self-Care Scale was created in 2005 by American researchers Fisher and Lee to assess the self-care of people with DM. The original scale had a Cronbach alpha of 0.80. The results of the pilot study revealed that after being applied to 10 patients with T2DM, the reliability of scale's Iraqi version was (r =0.84). The scale has 31 items and is a 4-option Likert scale; each is a 4-point Likert scale with response options never (1), sometimes (2), frequently (3) and always (4). The scale has a minimum score of

31 and a maximum score of 124; the higher the score, the better the diabetes patient's level of self-care. The scale includes factors like diet frequency and status, engaging in regular physical activity, following treatment recommendations, measuring and recording blood glucose, understanding the value of foot care, going to physician follow up for blood glucose control, using personal hygiene techniques, and being aware of diabetes and potential complications.

3.8. The validity of the Instrument:

The content of the program and the study instrument (the questionnaire) were presented by a committee of experts, who have experience in their fields and with regard to diabetes, its complications, how to care for diabetic patients to investigate the content of the program. The experts surveyed for this research are professors and assistant professors, doctors and practitioners who have extensive experience working in many areas within universities and educational health institutions in Iraq. these experts briefed the program and the tool by reviewing the instrument, the content program, clarity, relevance, and sufficiency, some elements (such as those that were not relevant to the topic) were excluded as well as adding some other elements (such as it is closely related to the topic that the researcher may forget to mentioned and appropriate to setting, culture and population), and all comments and recommendations were taken into account. added These experts were (3) faculty members at the College of Nursing in the University of Babylon (4) faculty members at the College of Nursing in the University of Baghdad, (1) faculty members at the College of Nursing in the University of Al Kufa, (1) faculty members at the College of Nursing in the University of Karbala and (3) endocrinologists from Diabetes and Endocrinology Center in the AL- Dewaynia Teaching Hospital.

3.9. Pilot study

A pilot study was conducted on (10) patients who were attending in the Endocrine and Diabetes Center in Al- Diwaniyah Teaching Hospital. They were excluded from original sample of the study.

The purposes of pilot study are to:

1. Recognize the obstacles that can be faced throughout the collection of data procedure
2. Estimate the best approach needed to make patients collaborated with the researcher and to recognize the problems that the researcher might meet.
3. Measure the reliability of the questionnaire.
4. Determine the typical time needed to collect data for each subject.
5. Obtain the clarity and the relevancy of the questionnaire.

Nieswiadomy, (2012) mentioned that using of pilots study to examine a new tool or to assess a presented instrument. It also can be used to decide the time needed perform to collect data, and to estimate the patients' reaction to method of data collection.

3. 10. Reliability of the instrument

Reliability is refers to an extent to which a question

naire reports the same results on repeated time measure. Briefly it refers to consistent scores over times or raters (Bolarinwa, 2015).

The reliability of the instrument was determined through the computation of Correlation Coefficient; internal consistency method was used for determining the reliability. The Correlation Coefficient was applied to determine the reliability of the present study instrument by application of Statistical Package for Social Science Program (IBM SPSS) version 22.0.

Reliability is concerned with the consistency and dependability of a research instrument to measure a variable of interest. Determining the reliability of the questionnaire depends on the Pearson correlation coefficients (stability and reliability of the test and retest method obtained by accessing (10) patients selected from the diabetes and endocrine center.

Table (3-1) was statistically created to test the reliability coefficient of the instrument used in the present study, and the result shows that there is an acceptable level of the reliability value of correlation coefficients for the table, and then there is an acceptable level of reliability scale.

Table 3-1: Reliability of the Studied Questionnaire:

Scale study	Number of Items	Actual value	Assessment
Self-care items	31	0.84	Accept

The degree of reliability may be determined by a correlation analysis. Coefficients of reliability are determined by a number range from (-1 to +1), and a value of 0.70 is considered acceptable. The patients' self-care had a coefficient of reliability of 0.84 throughout all domains. The estimated results of the questionnaire indicate that the research tool can measure the phenomenon in question at any time in the future **(**Barton & Peat, 2014).

3.11. Analysis

The appropriate statistical methods were used in this study to analyze data and obtain the results. SPSS (version 22) statistics package program for social sciences was used for the statistical analysis. A descriptive statistical analysis is used to describe the distribution of demographic characteristics of sample; frequency and percentage were the appropriate statistical analysis used. An

inferential statistics was used "ANOVA'' test that utilized in both control and study groups, and t-test also used to identify the result of comparing between pre-test for both control and study group.

3.11.1. Descriptive data analysis:

1. **Frequency distribution:** used to calculate the description of demographic characteristics.
2. **Percentage (%)**

$$\% \equiv \frac{Frequencies}{sample\ size} x100$$ (Polit D and Hungler, 2004)

3-Mean: use to estimate the value of the data

$$\bar{x} \equiv \frac{\sum fi}{n}$$

4-Mean of scores "M.S."**:**

$$M.S = \frac{\sum ri = 1Fi \times Si}{\sum ri = 1Fi} x100$$

5-Standard Deviation (SD):

$$SD = \sqrt{\frac{1}{n-1}\sum_{i=1}^{n}(Xi - \bar{\chi})^2}$$

3.11.2. Inferential data analysis:

This approach is performed through the application of the following:

1. **Sample Independent t-test:**

A. Paired Sample t-test

In order to measure the significance of the difference in two tests administered to the same group, as in a before-and-after intervention group.

B-Independent Sample t-test

To evaluate the significance of the measurement difference between two groups, such as the pre-test of the study group and the pre-test of the control group, based on the following question.

$$t = \frac{\bar{x}1 - \bar{x}2}{Sp\sqrt{n1-1)s21 + (n2-1)s2/n1+n2-2}}$$

2- Measure analysis of variance (ANOVA) Test: is analysis tool used in statistics that splits an observed aggregate variability found inside a data set into parts systemic factors and random factors.

Source of variance	Sum of square	d.f	Mean square	F
Between Groups	$SS_B = \sum \frac{(\sum xP1)^2}{n} - \frac{(\sum xP)^2}{n}$	$df_B = K-1$	$\frac{MS\beta}{MS\beta}$	$\frac{MSB}{MSW}$
Within Groups	$SS_W = \sum \frac{(\sum xP1)^2}{(\sum xP)^2} - \frac{}{N}$	$df_w = N-k$	$\frac{SSw}{DFw}$	
Total	$SS_T = \sum \frac{(\sum xP1)^2}{(\sum xP)^2} - \frac{}{N}$	$df_1 = N-1$		

P-value (≤0.05)

- **Chi-Square test (X^2)** to test the independence of observed frequency distributions and to measure the type-specific association between study variables.

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

Chapter Four
Results of the Study

Chapter Four

Results of the Study

This chapter presents the results of the data analysis systematically in tables and these corresponded with the objectives of the study as follows:

Table (4-1): Distribution of Demographic Data of Both Groups (N=60)

Demographic Data		Control N=30		Study N=30	
		F	%	F	%
Age / Years	20-29	2	6.7	1	3.3
	30-39	4	13.3	1	3.3
	40-49	6	20.0	9	30.0
	50-60	18	60.0	19	63.3
	M ± SD	49.56± 9.75			
Sex	Male	14	46.7	13	43.3
	Female	16	53.3	17	56.7
Marital Status	Single	4	13.4	1	3.3
	Married	20	66.6	23	76.7
	Separated	1	3.3	0	0
	Divorced	1	3.3	1	3.3
	Widowed	4	13.4	5	16.7
Education	Unable to Read and Write	10	33.3	12	40.0
	Read and Write	5	16.7	5	16.7
	Primary school Graduate	6	20.0	8	26.7
	Intermediate school Graduate	2	6.7	2	6.7
	Secondary school Graduate	2	6.7	0	0
	Institute Graduate	3	10.0	2	6.7
	College Graduate	2	6.7	1	3.3
Occupation	Employee	5	16.7	3	10.0
	free businessman	5	16.7	8	26.7
	Unemployed	1	3.3	1	3.3
	Student	1	3.3	1	3.3
	Retired	6	20.0	4	13.4

	Housewife	**12**	**40.0**	**13**	**43.3**
Income	**Sufficient**	**7**	**23.3**	**4**	**13.3**
	Barely Sufficient	**15**	**50.0**	**14**	**46.7**
	Not Sufficient	**8**	**26.7**	**12**	**40.0**
Residency	**Rural**	**12**	**40.0**	**11**	**36.7**
	Urban	**18**	**60.0**	**19**	**63.3**

*F=frequency, %= percentage

As clarified in (Table 4.1), a total of 60 patients with type2 diabetes were included in the study, and divided equally into control and study group (30 patients at each group). The participants' age group at a level (50-60 years) for both control and study group were (60% and 63.3%) respectively and the mean age was (49.56± 9.75) for study and control group.

Regarding the gender (53.3% and 56.7%) respectively of the control and study group was female. Relative to marital status participants of both the control and study group were married (66.7% and 76.7%) respectively.

Concerning educational level, the distribution of findings in the control and study group as unable read and write (33.3% and 40.0%) respectively. Majority of participants in the control and study group were housewife (40.0% and 43.3%) respectively. Both group control and study residents in urban areas and make barely sufficient Income.

Table (4-2): Distribution of Clinical Data of Both Groups (N=60).

Clinical Data			Control N=30		Study N=30	
			F	%	F	%
Smoking status		Smoker	5	16.7	5	16.7
		Non-Smoker	24	80.0	21	70.0
		Ex-Smoker	1	3.3	4	13.3
Disease duration		Less than 3 years	2	6.7	3	10.0
		3-6 years	7	23.3	8	26.7
		7-10 years	15	50.0	11	36.6
		More than 10 years	6	20.0	8	26.7
Type of treatment		Oral antidiabetics	9	30.0	6	20.0
		Insulin	5	16.7	7	23.3
		Oral antidiabetics plus insulin	15	50.0	15	50.0
		Oral antidiabetics before and insulin now	1	3.3	2	6.7
Do you receive an education about diabetes management self-care?		Yes	2	6.7	3	10.0
		No	28	93.3	27	90.0
Family diabetes history		Non	13	43.3	3	10.0
		Father side	12	40.0	14	46.7
		Mother side	5	17.0	13	43.3
DM complications	Eye	Yes	13	43.3	15	50.0
		No	17	56.7	15	50.0
	Neurological	Yes	7	23.3	5	16.7
		No	23	76.7	25	83.3
	Cardiovascular	Yes	7	23.3	6	20.0
		No	23	76.7	24	80.0
	Diabetic foot	Yes	5	16.7	4	13.3
		No	25	83.3	26	86.7
	Renal	Yes	2	6.7	3	10.0
		No	28	93.3	27	90.0
	Hepatic	Yes	0	0	1	3.3
		No	30	100	29	96.7
Body mass index		Under weight	2	6.7	2	6.7
		Normal weight	5	16.7	8	26.7
		Over weight	11	36.7	12	40.0
		Obese	8	26.7	5	16.7
		Severely obese	4	13.3	3	10.0

F=frequency, %= percentage

Table (4-2) shows that the smoking status for both group control and study were nonsmoking (80.0% and 70.0%) respectively. Regarding the duration of disease, a larger proportion (50% and 36.7%) respectively for both group control and study were between 7-10 years. Relative to the treatment, about (50%) of patients used Oral antidiabetics plus insulin. Concerning receiving of health education about the self-care activity, the study results show that (93.3% and 90%) respectively of the control and study sample are not receiving education. Concerning the past diabetes family history, the study results indicate that 40% and 46.7% of the control and study have a positive family history from father side respectively. Relative to the complication, the highest percentage (43.3% and 50%) are suffering from eye complication for control and study respectively and Majority of patients in both groups with overweight body mass index (36.7% and 40%) respectively.

Table (4-3a): Summary Statistics for Control Group Respondents in the Pre-test Measurement for their Answers

Items	Response	Pre-Test Measurement			
		F	%	Mean	Evaluation
1) I eat my meals at the same time everyday	Never	1	3.3	1.96	Poor
	Sometimes	29	96.7		
2) I always eat my snacks	Never	5	16.7	2.56	Fair
	Sometimes	8	26.7		
	Frequently	12	40.0		
	Always	5	16.7		
3) I keep bound to my diet when I eat out in the restaurants	Never	7	23.3	2.16	Fair
	Sometimes	13	43.3		
	Frequently	8	26.7		
	Always	2	6.7		
4) I stick to my diet when I go to invitations (to others, friends, meetings	Never	8	26.7	2.03	Fair
	Sometimes	16	53.3		
	Frequently	3	10.0		
	Always	3	10.0		

5) I keep bound to my diet even when the people around me bound I do not know I am diabetic	Never	11	36.7	1.80	Poor
	Sometimes	16	53.3		
	Frequently	1	3.3		
	Always	2	6.7		
6) I do not eat excessively	Never	11	36.7	1.73	Poor
	Sometimes	17	56.7		
	Frequently	1	3.3		
	Always	1	3.3		
7) I do exercise regularly	Never	9	30.0	1.73	Poor
	Sometimes	20	66.7		
	Frequently	1	3.3		
8) I do my exercises even when I don't feel like exercising	Never	5	16.7	2.23	Fair
	Sometimes	16	53.3		
	Frequently	6	20.0		
	Always	3	10.0		
9) I do exercise adequately	Never	19	63.3	1.36	Poor
	Sometimes	11	36.7		
10) I measure my blood sugar	Never	25	83.3	1.16	Poor
	Sometimes	5	16.7		
11) I keep records of my blood sugar measurements	Never	23	76.7	1.23	Poor
	Sometimes	7	23.3		
12) I take my oral anti diabetic drugs as recommended	Never	13	43.3	1.80	Poor
	Sometimes	10	33.3		
	Frequently	7	23.3		
13) I take my insulin injections as recommended	Never	16	53.3	1.60	Poor
	Sometimes	10	33.3		
	Frequently	4	13.3		
14) I adjust my insulin dosage according to my blood sugar measurements	Never	11	36.7	2.06	Fair
	Sometimes	8	26.7		
	Frequently	9	30.0		
	Always	2	6.7		
15) I keep a lump sugar with me when I'm out/away from home	Never	19	63.3	1.50	Poor
	Sometimes	7	23.3		
	Frequently	4	13.3		
16) I eat a lump sugar when my blood sugar drops	Never	14	46.7	1.80	Poor
	Sometimes	8	26.7		
	Frequently	8	26.7		
17) I regularly go and see my	Never	7	23.3	1.96	Poor

doctor	Sometimes	17	56.7		
	Frequently	6	20.0		
18) I consult my doctor when my blood sugar level rises extremely.	Never	15	50.0	1.73	Poor
	Sometimes	9	30.0		
	Frequently	5	16.7		
	Always	1	3.3		
19) I consult my doctor when my blood sugar level drops extremely.	Never	8	26.7	1.76	Poor
	Sometimes	21	70.0		
	Frequently	1	3.3		
20) I regularly check my feet.	Never	12	40.0	1.63	Poor
	Sometimes	17	56.7		
	Frequently	1	3.3		
21) I always wear shoes, by all means, outside of the house.	Never	13	43.3	1.60	Poor
	Sometimes	16	53.3		
	Frequently	1	3.3		
22) I always wear a slipper or a house-shoe when inside the house	Never	5	16.7	1.90	Poor
	Sometimes	24	80.0		
	Always	1	3.3		

Table (4-3a): Cont.….

23) I always wear socks.	Never	5	16.7	2.23	Fair
	Sometimes	15	50.0		
	Frequently	8	26.7		
	Always	2	6.7		
24) I keep my toenails short and straight.	Never	11	36.7	1.76	Poor
	Sometimes	16	53.3		
	Frequently	2	6.7		
	Always	1	3.3		
25) I brush my teeth every day.	Never	5	16.7	2.13	Fair
	Sometimes	17	56.7		
	Frequently	7	23.3		
	Always	1	3.3		
26) I carry a diabetes identification card on me.	Never	6	20.0	2.23	Fair
	Sometimes	13	43.3		
	Frequently	9	30.0		
	Always	2	6.7		
27) I talk with the other diabetes patients about how	Never	10	33.3	1.80	Poor
	Sometimes	16	53.3		

they care for themselves	Frequently	4	13.3		
	Always				
28) I consult nurses, doctors, and other health care providers/specialists about how to prevent complications.	Never	17	56.7	1.43	Poor
	Sometimes	13	43.3		
29) I read the hand-outs and brochures about diabetes, when given.	Never	7	23.3	1.80	Poor
	Sometimes	22	73.3		
	Frequently	1	3.3		
30) I do research on the internet to find information about diabetes.	Never	28	93.3	1.06	Poor
	Sometimes	2	6.7		
31) Use the things I learn to avoid any complications that can occur about diabetes.	Never	29	96.7	1.03	Poor
	Sometimes	1	3.3		

Poor knowledge (mean 1-2); fair knowledge (mean 2.1-3), good knowledge (mean 3.1-4), %= percentage; f= frequency.

The findings demonstrated assessment of the patient responses in the pre- test for control group. The study results indicate that the control group at the pre-test are poor self-care about type 2 diabetes mellitus in all studied items except, the items number (2, 3, 4, 8,14,23,25 and 26) the responses were fair knowledge about self-care for type 2 diabetes mellitus.

Table (4-3b): Summary Statistics for Control Group Respondents in the Post-test Measurement for Their Answers

Items	Response	Post-Test Measurement			
		F	%	Mean	Evaluation
1) I eat my meals at the same time everyday	Never	12	40.0	1.93	Poor
	Sometimes	9	30.0		
	Frequently	8	26.7		
	Always	1	3.3		
2) I always eat my snacks	Never	16	53.3	1.63	Poor
	Sometimes	11	36.7		
	Frequently	1	3.3		

	Always	2	6.7		
3) I keep bound to my diet when I eat out in the restaurants	Never	12	40.0	1.93	Poor
	Sometimes	12	40.0		
	Frequently	2	6.7		
	Always	4	13.3		
4) I stick to my diet when I go to invitations (to others, friends, meetings	Never	16	53.3	1.73	Poor
	Sometimes	8	26.7		
	Frequently	4	13.3		
	Always	2	6.7		
5) I keep bound to my diet even when the people around me bound I do not know I am diabetic	Never	16	53.3	1.66	Poor
	Sometimes	9	30.0		
	Frequently	4	13.3		
	Always	1	3.3		
6) I do not eat excessively	Never	18	60.0	1.66	Poor
	Sometimes	5	16.7		
	Frequently	6	20.0		
	Always	1	3.3		
7) I do exercise regularly	Never	18	60.0	1.50	Poor
	Sometimes	9	30.0		
	Frequently	3	10.0		
8) I do my exercises even when I don't feel like exercising	Never	26	86.7	1.13	Poor
	Sometimes	4	13.3		
9) I do exercise adequately	Never	19	63.3	1.53	Poor
	Sometimes	6	20.0		
	Frequently	5	16.7		
10) I measure my blood sugar	Never	9	30.0	2.16	Fair
	Sometimes	10	33.3		
	Frequently	8	26.7		
	Always	3	10.0		
11) I keep records of my blood sugar measurements	Never	20	66.7	1.5	Poor
	Sometimes	6	20.0		
	Frequently	3	10.0		
	Always	1	3.3		
12) I take my oral anti diabetic drugs as recommended	Never	20	66.7	1.70	Poor
	Sometimes	3	10.0		
	Frequently	3	10.0		
	Always	4	13.3		
13) I take my insulin injections	Never	13	43.3	2.13	Fair

as recommended	Sometimes	4	13.3		
	Frequently	9	30.0		
	Always	4	13.3		
14) I adjust my insulin dosage according to my blood sugar measurements	Never	6	20.0	2.43	Fair
	Sometimes	9	30.0		
	Frequently	11	36.7		
	Always	4	13.3		
15) I keep a lump sugar with me when I'm out/away from home	Never	3	10.0	2.56	Fair
	Sometimes	12	40.0		
	Frequently	10	33.3		
	Always	5	16.7		
16) I eat a lump sugar when my blood sugar drops	Never	14	46.7	2.02	Fair
	Sometimes	5	16.7		
	Frequently	7	23.3		
	Always	4	13.3		
17) I regularly go and see my doctor	Never	5	16.7	2.33	Fair
	Sometimes	14	46.7		
	Frequently	7	23.3		
	Always	4	13.3		
18) I consult my doctor when my blood sugar level rises extremely.	Never	11	36.7	1.80	Poor
	Sometimes	14	46.7		
	Frequently	5	16.7		
19) I consult my doctor when my blood sugar level drops extremely.	Never	15	50.0	1.56	Poor
	Sometimes	14	46.7		
	Always	1	3.3		
20) I regularly check my feet.	Never	3	10.0	2.26	Fair
	Sometimes	19	63.3		
	Frequently	5	16.7		
	Always	3	10.0		
21) I always wear shoes, by all means, outside of the house.	Never	9	30.0	2.20	Fair
	Sometimes	9	30.0		
	Frequently	9	30.0		
	Always	3	10.0		
22) I always wear a slipper or a house-shoe when inside the house	Never	13	43.3	1.90	Poor
	Sometimes	8	26.7		
	Frequently	8	26.7		
	Always	1	3.3		
23) I always wear socks.	Never	14	46.7	1.76	Poor

	Sometimes	9	30.0		
	Frequently	7	23.3		
24) I keep my toenails short and straight.	Never	3	10.0	2.76	Fair
	Sometimes	7	23.3		
	Frequently	14	46.7		
	Always	6	20.0		
25) I brush my teeth every day.	Never	7	23.3	2.20	Fair
	Sometimes	13	43.3		
	Frequently	7	23.3		
	Always	3	10.0		
26) I carry a diabetes identification card on me.	Never	19	63.3	1.56	Poor
	Sometimes	7	23.3		
	Frequently	2	6.7		
	Always	2	6.7		
27) I talk with the other diabetes patients about how they care for themselves	Never	4	13.3	2.16	Fair
	Sometimes	19	63.3		
	Frequently	5	16.7		
	Always	2	6.7		
28) I consult nurses, doctors, and other health care providers/specialists about how to prevent complications.	Never	11	36.7	1.93	Poor
	Sometimes	12	40.0		
	Frequently	5	16.7		
	Always	2	6.7		
29) I read the hand-outs and brochures about diabetes, when given.	Never	24	80.0	1.30	Poor
	Sometimes	4	13.3		
	Frequently	1	3.3		
	Always	1	3.3		
30) I do research on the internet to find information about diabetes.	Never	20	66.7	1.56	Poor
	Sometimes	5	16.7		
	Frequently	3	10.0		
	Always	2	6.7		
31) Use the things I learn to avoid any complications that can occur about diabetes.	Never	9	30.0	2.16	Fair
	Sometimes	9	30.0		
	Frequently	10	33.3		
	Always	2	6.7		

Poor knowledge (mean 1-2); fair knowledge (mean 2.1-3), good knowledge (mean 3.1-4), %= percentage; f= frequency.

The findings demonstrated assessment of the patient responses in the pre- test for control group. The study results indicate that the control group at the pre-test are poor self-care about type2 diabetes mellitus in all studied items except, the items number (10, 13, 14, 15,16,17,20,21,24,25 and 31) the responses were fair knowledge about self-care for type 2 diabetes mellitus.

Table (4-3c): Overall Evaluation of Patent's Knowledge at Pre-test and Post-test Measurement for Control Group

Periods of Measurements	Level of Knowledge	Statistical parameters			Evaluation
		F	%	Mean ± SD	
Pre-Test	Poor	25	83.3	1.76 ± 0.203	Poor
	Fair	5	16.7		
	Good	0	0		
	Total	30	100		
Post-Test	Poor	20	70	1.89± 0.284	Poor
	Fair	10	30		
	Good	0	0		
	Total	30	100		

Poor knowledge (mean 1-2); fair knowledge (mean 2.1-3), good knowledge (mean 3.1-4). %= percentage; f= frequency

Table (4-3C) shows that the patients had a low knowledge level during the pre-test period (mean ± SD=1.76 ± 0.203) (n=25; 83.3%). also in post-test same level(mean ± SD=1.89 ± 0.284) (n=20; 70%). There were unobservable progress in passing items among control group post-test because they did not exposed to any intervention related knowledge.

Table (4-3d): Mean Difference (Paired T-Test) between the Control Group Responses at Two Levels of Measurement (Pre-Test and Post-Test)

Periods of measurement	Mean	N	SD	t-value	d.f.	p-value
Pre-test	1.76	30	0.203	1.836	29	0.077 NS
Post-test	1.89	30	0.284			

Findings illustrated that there is non-significant difference between the control group responses in two periods of measurements (pre-test and posttest) at p-value 0.07.

Table (4-4a): Summary Statistics for Study Group Respondents in the Pre-Test Measurement for Their Answers

Items	Response	Pre-Test Measurement			
		F	%	Mean	Evaluation
1) I eat my meals at the same time everyday	Never	12	40.0	1.90	Poor
	Sometimes	11	36.7		
	Frequently	5	16.7		
	Always	2	6.7		
2) I always eat my snacks	Never	6	20.0	2.73	Fair
	Sometimes	4	13.3		
	Frequently	12	40.0		
	Always	8	26.7		
3) I keep bound to my diet when I eat out in the restaurants	Never	11	36.7	2.16	Fair
	Sometimes	5	16.7		
	Frequently	12	40.0		
	Always	2	6.7		
4) I stick to my diet when I go to invitations (to others, friends, meetings	Never	11	36.7	1.83	Poor
	Sometimes	14	46.7		
	Frequently	4	13.3		
	Always	1	3.3		

5) I keep bound to my diet even when the people around me bound I do not know I am diabetic	Never	12	40.0	1.63	Poor
	Sometimes	17	56.7		
	Frequently	1	3.3		
6) I do not eat excessively	Never	18	60.0	1.70	Poor
	Sometimes	6	20.0		
	Frequently	3	10.0		
	Always	3	10.0		
7) I do exercise regularly	Never	46.7	14	1.73	Poor
	Sometimes	33.3	10		
	Frequently	20.0	6		
8) I do my exercises even when I don't feel like exercising	Never	11	36.7	2.1	Fair
	Sometimes	5	16.7		
	Frequently	14	46.7		
9) I do exercise adequately	Never	22	73.3	1.33	Poor
	Sometimes	6	20.0		
	Frequently	2	6.7		
10) I measure my blood sugar	Never	18	60.0	1.60	Poor
	Sometimes	7	23.3		
	Frequently	4	13.3		
	Always	1	3.3		
11) I keep records of my blood sugar measurements	Never	25	83.3	1.23	Poor
	Sometimes	3	10.0		
	Frequently	2	6.7		
12) I take my oral anti diabetic drugs as recommended	Never	13	43.3	1.93	Poor
	Sometimes	8	26.7		
	Frequently	7	23.3		
	Always	2	6.7		
13) I take my insulin injections as recommended	Never	19	63.3	1.60	Poor
	Sometimes	5	16.7		
	Frequently	5	16.7		
	Always	1	3.3		
14) I adjust my insulin dosage according to my blood sugar measurements	Never	11	36.7	2	Poor
	Sometimes	8	26.7		
	Frequently	11	36.7		
15) I keep a lump sugar with me when I'm out/away from home	Never	19	63.3	1.43	Poor
	Sometimes	9	30.0		
	Frequently	2	6.7		

16) I eat a lump sugar when my blood sugar drops	Never	9	30.0	2.16	Fair
	Sometimes	9	30.0		
	Frequently	10	33.3		
	Always	2	6.7		
17) I regularly go and see my doctor	Never	7	23.3	1.90	Poor
	Sometimes	19	63.3		
	Frequently	4	13.3		
18) I consult my doctor when my blood sugar level rises extremely.	Never	5	16.7	2.53	Fair
	Sometimes	8	26.7		
	Frequently	13	43.3		
	Always	4	13.3		
19) I consult my doctor when my blood sugar level drops extremely.	Never	12	40.0	1.76	Poor
	Sometimes	13	43.3		
	Frequently	5	16.7		
20) I regularly check my feet.	Never	13	43.3	1.63	Poor
	Sometimes	16	53.3		
	Always	1	3.3		
21) I always wear shoes, by all means, outside of the house.	Never	20	66.7	1.60	Poor
	Sometimes	4	13.3		
	Frequently	4	13.3		
	Always	2	6.7		
22) I always wear a slipper or a house-shoe when inside the house	Never	10	33.3	1.86	Poor
	Sometimes	15	50.0		
	Frequently	4	13.3		
	Always	1	3.3		
23) I always wear socks.	Never	6	20.0	2.13	Fair
	Sometimes	16	53.3		
	Frequently	6	20.0		
	Always	2	6.7		
24) I keep my toenails short and straight.	Never	16	53.3	1.66	Poor
	Sometimes	8	26.7		
	Frequently	6	20.0		
25) I brush my teeth every day.	Never	15	50.0	1.76	Poor
	Sometimes	8	26.7		
	Frequently	6	20.0		
	Always	1	3.3		
26) I carry a diabetes identification card on me.	Never	11	36.7	2.13	Fair
	Sometimes	7	23.3		

	Frequently	9	30.0		
	Always	3	10.0		
27) I talk with the other diabetes patients about how they care for themselves	Never	9	30.0	2.13	Fair
	Sometimes	11	36.7		
	Frequently	7	23.3		
	Always	3	10.0		
28) I consult nurses, doctors, and other health care providers/specialists about how to prevent complications.	Never	10	33.3	1.80	Poor
	Sometimes	16	53.3		
	Frequently	4	13.3		
29) I read the hand-outs and brochures about diabetes, when given.	Never	22	73.3	1.43	Poor
	Sometimes	3	10.0		
	Frequently	5	16.7		
30) I do research on the internet to find information about diabetes.	Never	15	50.0	1.80	Poor
	Sometimes	6	20.0		
	Frequently	9	30.0		
31) Use the things I learn to avoid any complications that can occur about diabetes.	Never	13	43.3	1.73	Poor
	Sometimes	12	40.0		
	Frequently	5	16.7		

Poor knowledge (mean 1-2); fair knowledge (mean 2.1-3), good knowledge (mean 3.1-4), %= percentage; f= frequency.

The findings demonstrated assessment of the patient responses in the pre- test for study group. The study results indicate that the study group at the pre-test are poor self-care about type 2 diabetes mellitus in all studied items except, the items number (2, 3, 8, 16, 18, 23, 26 and 27) the responses were fair knowledge about self-care for type 2 diabetes mellitus.

Table (4-4b): Summary Statistics for Study Group Respondents Levels of Measurement (Post-Test)

Items	Response	Post-Test I Measurement				Post-Test II Measurement			
		F	%	Mean	Evaluation	F	%	Mean	Evaluation
1) I eat my meals at the same time everyday	Sometimes	0	0	3.66	Good	4	13.3	3.50	Good
	Frequently	10	33.3			7	23.3		
	Always	20	66.7			19	63.3		
2) I always eat my snacks	Never	0	0	3.30	Good	1	3.3	3.06	Good
	Sometimes	2	6.7			4	13.3		
	Frequently	17	56.7			17	56.7		
	Always	11	36.7			8	26.7		
3) I keep bound to my diet when I eat out in the restaurants	Never	0	0	3.43	Good	1	3.3	3.26	Good
	Sometimes	2	6.7			1	3.3		
	Frequently	13	43.3			17	56.7		
	Always	15	50.0			11	36.7		
4) I stick to my diet when I go to invitations (to others, friends, meetings	Sometimes	3	10.0	2.96	Fair	7	23.3	3.83	Good
	Frequently	25	83.3			21	70.0		
	Always	2	6.7			2	6.7		
5) I keep bound to my diet even when the people around me bound I do not know I am diabetic	Never	2	6.7	2.80	Fair	0	0	2.80	Fair
	Sometimes	5	16.7			8	26.7		
	Frequently	20	66.7			20	66.7		
	Always	3	10.0			2	6.7		
6) I do not eat excessively	Sometimes	8	26.7	3.23	Good	11	36.7	3.03	Good
	Frequently	7	23.3			7	23.3		
	Always	15	50.0			12	40.0		
7) I do exercise regularly	Never	1	3.3	2.80	Fair	0	0	2.80	Fair
	Sometimes	6	20.0			10	33.3		

	Frequently	21	70.0			16	53.3		
	Always	2	6.7			4	13.3		
8) I do my exercises even when I don't feel like exercising	Never	0	0	2.26	Fair	1	3.3	2.36	Fair
	Sometimes	24	80.0			18	60.0		
	Frequently	4	13.3			10	33.3		
	Always	2	6.7			1	3.3		
9) I do exercise adequately	Sometimes	12	40.0	2.73	Fair	12	40.0	2.66	Fair
	Frequently	14	46.7			16	53.3		
	Always	4	13.3			2	6.7		
10) I measure my blood sugar	Never	1	3.3	3.53	Good	0	0	3.13	Good
	Sometimes	2	6.7			8	26.7		
	Frequently	7	23.3			10	33.3		
	Always	20	66.7			12	40.0		
11) I keep records of my blood sugar measurements	Sometimes	14	46.7	2.60	Fair	10	33.3	2.70	Fair
	Frequently	14	46.7			19	63.3		
	Always	2	6.7			1	3.3		
12) I take my oral anti diabetic drugs as recommended	Sometimes	2	6.7	3.76	Good	2	6.7	3.66	Good
	Frequently	3	10.0			6	20.0		
	Always	25	83.3			22	73.3		
13) I take my insulin injections as recommended	Sometimes	2	6.7	3.63	Good	2	6.7	3.56	Good
	Frequently	7	23.3			9	30.0		
	Always	21	70.0			19	63.3		
14) I adjust my insulin dosage according to my blood sugar measurements	Never	1	3.3	3.20	Good	1	3.3	3.30	Good
	Sometimes	4	13.3			1	3.3		
	Frequently	13	43.3			16	53.3		
	Always	12	40.0			12	40.0		

15) I keep a lump sugar with me when I'm out/away from home	Sometimes	3	10.0	3.20	Good	2	6.7	3.23	Good
	Frequently	18	60.0			19	63.3		
	Always	9	30.0			9	30.0		
16) I eat a lump sugar when my blood sugar drops	Frequently	11	36.7	3.63	Good	11	36.7	3.63	Good
	Always	19	63.3			19	63.3		
17) I regularly go and see my doctor	Never	1	3.3	3.06	Good			3.16	Good
	Sometimes	4	13.3			3	10.0		
	Frequently	17	56.7			19	63.3		
	Always	8	26.7			8	26.7		
18) I consult my doctor when my blood sugar level rises extremely.	Sometimes	9	30.0	2.80	Fair	10	33.3	2.76	Fair
	Frequently	18	60.0			17	56.7		
	Always	3	10.0			3	10.0		
19) I consult my doctor when my blood sugar level drops extremely.	Sometimes	5	16.7	3.06	Good	7	23.3	2.93	Fair
	Frequently	18	60.0			18	60.0		
	Always	7	23.3			5	16.7		
20) I regularly check my feet.	Sometimes	2	6.7	3.43	Good	1	3.3	3.43	Good
	Frequently	13	43.3			15	50.0		
	Always	15	50.0			14	46.7		
21) I always wear shoes, by all means, outside of the house.	Sometimes	2	6.7	3.33	Good	0	0	3.40	Good
	Frequently	16	53.3			18	60.0		
	Always	12	40.0			12	40.0		
22) I always wear a slipper or a house-shoe when inside the house	Sometimes	2	6.7	3.46	Good	2	6.7	3.40	Good
	Frequently	12	40.0			14	46.7		
	Always	16	53.3			14	46.7		
23) I always wear socks.	Sometimes	2	6.7	3.66	Good	2	6.7	3.60	Good
	Frequently	6	20.0			8	26.7		

	Always	22	73.3			20	66.7		
24) I keep my toenails short and straight.	Sometimes	0	0	3.66	Good	1	3.3	3.53	Good
	Frequently	11	36.7			12	40.0		
	Always	19	63.3			17	56.7		
25) I brush my teeth every day.	Sometimes	1	3.3	3.43	Good	1	3.3	3.43	Good
	Frequently	15	50.0			15	50.0		
	Always	14	46.7			14	46.7		
26) I carry a diabetes identification card on me.	Sometimes	1	3.3	3.53	Good	1	3.3	3.53	Good
	Frequently	12	40.0			12	40.0		
	Always	17	56.7			17	56.7		
27) I talk with the other diabetes patients about how they care for themselves	Sometimes	3	10.0	3.40	Good	2	6.7	3.43	Good
	Frequently	12	40.0			13	43.3		
	Always	15	50.0			15	50.0		
28) I consult nurses, doctors, and other health care providers/specialists about how to prevent complications.	Sometimes	4	13.3	3.33	Good	4	13.3	3.33	Good
	Frequently	12	40.0			12	40.0		
	Always	14	46.7			14	46.7		
29) I read the hand-outs and brochures about diabetes, when given.	Sometimes	11	36.7	2.76	Fair	11	36.7	2.73	Fair
	Frequently	15	50.0			16	53.3		
	Always	4	13.3			3	10.0		
30) I do research on the internet to find information about diabetes.	Never	29	96.7	1.03	Poor	14	46.7	1.96	Poor
	Sometimes	1	3.3			3	10.0		
	Frequently	0	0			13	43.3		

31) Use the things I learn to avoid any complications that can occur about diabetes.	Sometimes	1	3.3	3.63	Good	1	3.3	3.50	Good
	Frequently	9	30.0			13	43.3		
	Always	20	66.7			16	53.3		

Poor knowledge (mean 1-2); fair knowledge (mean 2.1-3), good knowledge (mean 3.1-4), %= percentage; f= frequency.

The findings demonstrated assessment of the patient responses in the post- test for study group. The study results indicate that the study group at the post-test I are good self-care about type 2 diabetes mellitus in all studied items except, the items number (4, 5,7, 8, 9,11, 18, 29 and 30) the responses were fair and poor knowledge about self-care for type 2 diabetes mellitus. While the results indicate that the study group at the post-test II are good self-care about type 2 diabetes mellitus in all studied items except, the items number (5,7, 8, 9,11, 18,19, 29 and 30) the responses were fair and poor knowledge about self-care for type 2 diabetes mellitus.

Table (4-4c): Overall Evaluation of Patient's Knowledge at Pre-test and Post-test Measurement for Study Group

Periods of Measurements	Level of Knowledge	Statistical parameters			Evaluation
		F	%	Mean ± SD	
Pre-Test	Poor	23	76.7	1.83±0.214	Poor
	Fair	7	23.3		
	Good	0	0		
	Total	30	100		
Post-Test I	Poor	0	0	3.17± 0.156	Good
	Fair	3	10		
	Good	27	90		
	Total	30	100		
Post-Test II	Poor	0	0	3.15 ± 0.149	Good
	Fair	6	20		
	Good	24	80		
	Total	30	100		

Poor knowledge (mean 1-2); fair knowledge (mean 2.1-3), good knowledge (mean 3.1-4). %= percentage; f= frequency

Table (4-4C) shows that the patients had a poor knowledge level during the pre-test period (mean ± SD=1.83 ± 0.214) (n=23; 76.7%). while in post-test1 and post-test11 the patients had a good knowledge level (mean ± SD=3.89 ± 0.156) (n=27; 90%) and (mean ± SD=3.15 ± 0.149) (n=24; 80%) respectively. The study results indicate that level of self-care remains the same even if it is measured over period of time

Table (4-4d): Mean Difference (Paired T-Test) between the Study Group Responses at Three Levels of Measurement (Pre-Test and Post-Test I; Post-Test I and Post-Test II)

Periods of measurement	Mean	N	Std. Deviation	t-value	d.f.	p-value
Pre-Test	1.83	30	0.214	32.92	29	**0.001 HS**
Post-Test I	3.173	30	0.156			
Post-Test I	3.173	30	0.156	1.152	29	**0.259 NS**
Post-Test II	3.152	30	0.156			

The results of table (4-4d) shows that there is a high-significant difference between the pre-test and post-test I at p-value 0.001, while there is non-significant difference between the post-test I and post-test II at p-value less than 0.259.

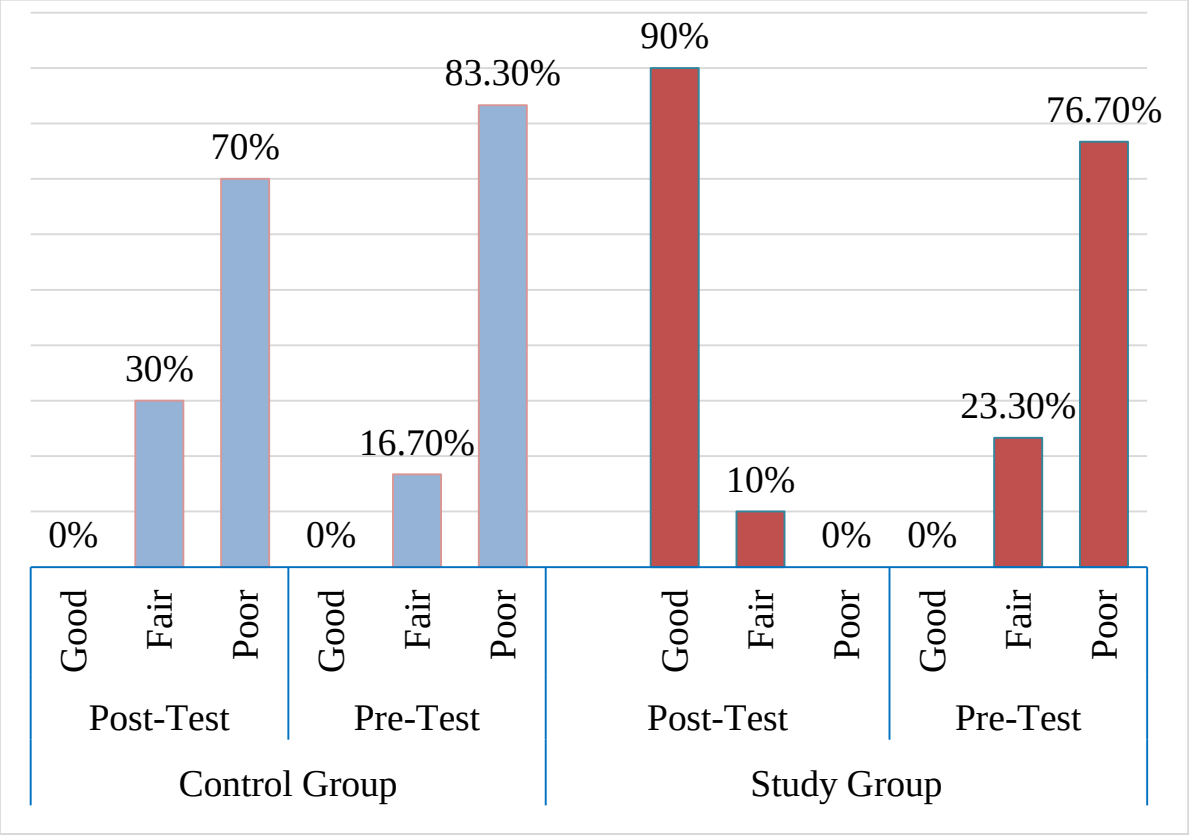

Figure (4.1) Summary Statistics of the Overall Patients' Knowledge (Study and Control Group) at Pre and Post Application of the Program (N= 30).

Table (4-5): Comparison of Total Patients' Knowledge between study and control group at Two Levels of Measurement (Pre-Test and Post-Test)

Periods of Measurement	Study Mean ± SD	Control Mean ± SD	Independent t-test	df	p-value
Pre-Test	1.83 ± 0.214	1.76 ± 0.203	1.274	58	**0.208 NS**
Post-Test	3.17 ± 0.156	1.89 ± 0.284	21.555	58	**0.001 HS**

The findings of aforementioned table demonstrated that there is a non-significant difference between the study and control groups in the pre-test concerning self-care of participants at p-value (0.208)more than 0.05, while there is a high significant difference between the study and control groups at the post-test with p-value(0.001) less than 0.05. With respect to the statistical mean the study results indicate that there is an improvement in the study group responses after the application of the program compared with the control group.

Table (4.6): Analysis of Variance (ANOVA) of the Patients' Knowledge after Application of the Program According to Their Demographic Data.

Demographic Data		Sum of Squares	Df	Mean Square	F	p-value
Age / Years	Between Groups	11.367	15	0.758	2.652	**0.038 S**
	Within Groups	4.000	14	0.286		
	Total	15.367	29			
Marital Status	Between Groups	30.933	15	2.062	2.741	**0.033 S**
	Within Groups	10.533	14	0.752		
	Total	41.467	29			
Education Level	Between Groups	61.100	15	4.073	3.222	**0.017 S**
	Within Groups	17.700	14	1.264		
	Total	78.800	29			
Occupation	Between Groups	52.167	15	3.478	0.816	**0.651 NS**
	Within Groups	59.700	14	4.264		
	Total	111.867	29			
Income	Between Groups	11.900	15	0.793	5.647	**0.001 HS**
	Within Groups	1.967	14	0.140		
	Total	13.867	29			

Table (4.6) Finding illustrated there were a significant difference between self-care of participants and demographical characteristics, the results show the age and marital status was significant with patient's knowledge about type 2 diabetes self-care when (P < 0.05). Besides, the association between Income of participants and their self-care, the results proves high significant difference when (P < 0.05). While the occupation of the sample shows there was non-significant difference at P-value (0.651) more than 0.05.

Table (4.7): Mean Difference (independent sample T-Test) of the Overall Patients' Knowledge according to their gender and Residency

Variable		N	Mean	Std. Deviation	t-value	df	p-value
Gender	Male	13	2.95	0.448	0.287	28	0.776 NS
	Female	17	2.90	0.544			
Residency	Urban	11	3.02	0.518	0.798	28	0.431 NS
	Rural	19	2.87	0.491			

Findings illustrated that there was non-significant differences between patient's knowledge about diabetes type 2 self-care and gender (p=0.776). also, current table shows there was non-significant differences between resident of participants and their knowledge, the results demonstrates non-significant association when (p=0.431) after educational programs with regard rural and urban residents.

Table (4.8): Effect of application of the program according to their clinical data

Clinical Data	X^2	Df	P value	Assessment
Smoking Status	2.903	4	0.574	NS
Disease Duration Since Diagnosis	7.757	6	0.256	NS
Type of Treatment	7.759	6	0.256	NS
Do you Receive an Education	11.329	4	**0.023**	**Sig.**
Family Diabetes History	0.020	2	0.990	NS
Body Mass Index	0.593	2	0.743	NS
DM Complications				
Eye complications	1.960	2	0.375	NS
Neurological complications	6.295	2	**0.043**	**Sig.**
Diabetic foot	8.677	2	**.013**	**Sig.**
Renal complications	2.286	2	0.319	NS
Hepatic complications	1.647	2	0.439	NS
X^2 = Chi-square ,Sig = significance, N.S = non significance, P value ≤ 0.05				

Table (4.8) Finding illustrated there were a significant difference between self-care of participants and clinical characteristics, the results show the do you receive an education was significant with patient's knowledge about type 2 diabetes self-care p-value (0.023) respectively. While the smoking status, disease duration since diagnosis, type of treatment, family diabetes history and body mass index of the sample shows there was non-significant difference at P-value (0.574) (0.256) (0.256) (0.990) and (0.743) respectively more than 0.05.

Regarding complications, there was non-significant between eye complications, renal complications and hepatic complications with patient's knowledge about type 2 diabetes self-care p-value (0.375) (0.319) and (0.439) respectively. While

the neurological complications and diabetic foot of the sample shows there was significant difference at P-value (0.043) and (0.013) respectively less than 0.05.

Chapter Five
Discussion
of the Results

Chapter Five

Discussion of the Results

The major issues presented in chapter four (Results) are highlighted in this chapter. Results were evaluated in an organized, methodical manner with a fair discussion that is backed up by the majority of prior studies that were relevant.

Part I: Discussion of Participants Sociodemographic Characteristics (Table4-1)

With regard to the sociodemographic characteristics of patients, there were significantly most participants of the study and control groups who have been more half between fifty and sixty years old,. This finding is consistent with study that had been carried out by Smalls *et al*., (2012), who had found that T2DM takes place at advanced age in (54%) of cases. Additionally, Salahen et al. (2020) discovered that, most participants have been between (40 and 50) years old. At a percentage of 53.19%.

These results are supported by Mosleh et al., (2017), who examined 330 participants for their study on the factors influencing T2DM patients' self-care management behaviors. They stated that most participants (35.20%) were between 57 and 68 years old. Also these findings were agreed with study conducted in Sudan by Amer et al., (2018), which showed that more than 50% of study sample was older than 51 years old (N;392=63.8%).

Moreover, Putra et al (2019) who conducted a study on 177 patients with diabetes mellitus, they reported that most participants were aged 56-65 years.

The researcher explains that the reason behind this finding was due to the study target sample were individuals with T2DM, which commonly occurs at an old age rather than a young age group.

In terms of patient gender, the study results showed that more than 50% of study sample's participants have been females. These results are consistent with study conducted by Tarabay et al., (2017) about improving a healthy lifestyle in people with T2DM in rural areas, which indicated that most study sample was female. While these findings contrast with study by Shin et al., (2013), who did the study with 430 participants, which finding more than 50% of participants (N=283; 65.8%) were men.

In additional, this result is disagreement with Yokota et al., (2019) study conducted to determine (effectiveness of a self-care footing tutorial to prevent diabetic foot disease) which the males were about (58%) compared to the females.

Moreover, Chao et al., (2019) study concerning improved self-efficacy and behavioral improvements among diabetes patients noted that more than 50% of study sample's participants were men. This is in disagreement with our findings.

Concerning marital status, most of participants in this study and control groups, have been married. These results agreement with finding of a study done by Ghonem and Aliin (2019) to assess "Effectiveness of health education program of foot self-care on risk for the development foot ulcer among diabetic patients" show that (76-70%) of the control and study groups are married.

Also another similar study was conducted by (Al Mansour, 2020) about "the prevalence and risk factors of type 2 diabetes mellitus (T2DM) in a semi-urban Saudi population". The majority of the sample was married (36.3%)

Concerning educational levels, the higher percentage of the control and study group one-third patients were unable to read and write educational level. This outcome is consistent with previous studies conducted by AL Ani and Oleiwi (2012) and Chaurasia et al. (2015) discovered that most of the study individuals are illiterates.

While, this result disagrees with study done by Mersal (2018) in Egypt, which indicates that the highest percentages had basic educational level (read and write) for both groups.

Regarding occupation, one –third of participants were of the control and study groups. This result is similar to that of Hamza and Mohammed-Ali (2016), who discovered that housewives made up the bulk of participants (43.5%), whereas freelancers made up 30%.

Also this result is consistent with a study done by Solan et al., (2016) they conduct to determine the (Diabetic Foot Care: Knowledge and Practice) in which women were housewives (38%).

Concerning monthly incomes, the most of sample results indicate that of the control and study samples have monthly incomes that are barely sufficient. These results were disagree with a study done by Abed (2021), who found that a higher percentage of both the control and study groups had insufficient incomes ranging from (150,000-300,000IQ), at (53.30% and 63.30%) respectively.

These results were in contrast with a study by Rajasekharan et al. (2015) and AL Ani and Oleiwi (2013), who discovered that most study sample has not enough monthly income. Moreover these results were in line with a study by

Abd El Latif et al., (2016) on quality of life and socioeconomic condition of T2DM patients in Egypt. More than 75% of the study sample had a low socioeconomic status level.

In terms of place of residence, more half of the study and control groups were primarily from urban regions. These results were agreed with a study done by Hamza and Mohammed-Ali (2016), who found that 78% of participants were from urban regions. Additionally, these finding concur with a study by Asa'ad *et al*., (2019), which aims to "assess quality of life of the patients who have type II diabetes in Erbil city". It demonstrates that almost all patients (81.9%) were from cities.

Part II: Discussion of Patients' Clinical Information Table 4-2.

According the history of patient smoking results indicate that most control and study group were nonsmoker. This agrees with the findings of Jackson, et al., (2014), who showed that his sample consisted of nonsmoking female patients with mean disease duration of about 1-5 years.

Also study done by El-Haddam et al., (2018), they find that the majority number of patients were no alcohol intake; no smoking and the most number of sample have chronic diseases.

Most participants in the study and control groups one-third and half participants respectively had diabetes between seven to teen years at the time of their diagnosis. These results disagree with study done by Salawu Rasadi and Ajibade Olapeju (2020), who found that higher study sample percentages had T2DM diagnoses for 0 to 5 years in the control as well as the study groups (48.1% and 65.5%, respectively).

Half of study and control group use oral antidiabetics plus insulin .This finding is supported by study Celik et al., (2022). Assessment the effect of

diabetes education on self-care behaviors and glycemic control in the turkey nursing diabetes education evaluating project, which found that (57.8%) used oral antidiabetics plus insulin.

While study by Petrovic et al., (2019), disagree with our finding which found that 61.1% of participants utilized oral anti-diabetic drugs. Whereas (15%) utilized both insulin and OAD, and (23.9%) injected the insulin. Another research that supports our findings was conducted by Aladhab and Alabood (2019), where more participants used oral antidiabetics (49.8%), fewer used insulin (15.2%), and a greater proportion used both (insulin + oral) (32.9%).

Concerning diabetes management self-care education, the majority of the control and study groups did not receive education (93.3 and 90.0%, respectively). This result disagree with the findings of Dinar et al., (2019), which indicate that the diabetes education has been delivered to about 52.5% of patients by doctor, nurses or dietitian 34.4%. The diabetes has been associated with other diseases in about 42.6% of patients.

Concerning the past diabetes family history, the study results indicate that 40% and 46.7% of the control and study have a family history from father side. Relative to the complication, half patients are suffering from eye complication for control and study respectively. This is corroborated by (Clothier, 2019) study, which found that most participants (52.30%) had family history of diabetes and that the most common diabetic complication among patients was peripheral neuropathy (59.2%), whereas the least common diabetic problem among patients was retinopathy (35.5%).

In terms of BMI, almost all the study and control groups one-third were overweight. These results agree with study done by Panduranga et al. (2010),

who carried out study with 120 individuals and reported that the majority of the study sample was overweight (N= 88; 72%).

In addition, another study carried out in Iran by Didarloo & Shojaeizadeh, (2014) on 352 participants, who mentioned that approximately a half of the participants in the study sample suffered overweight BMI.

Furthermore, Amer et al. (2018) study on 392 participants, which examined impacts of self-efficacy management on the self-care activity adherence and treatment outcomes in T2DM, supported these findings. They reported that more than half of the study sample (N= 250; 63.8%) was overweight or obese.

Part III: Distribution of control and study groups responses at pre and posttest about Self-Care Instruction regarding Controlling Type II Diabetes Mellitus:

A total of 31 items have been used to assess respondents' knowledge of self-care about diabetes mellitus type 2. At the pretest phase of assessment for both study groups, patients knowledge poor self-care about diabetes mellitus type 2, according to the pretest control group results (M ± SD=1.76 ± 0.203) (table 4-3c) and study group (M ± SD=1.83± 0.214) (table 4-4c). This is a worrying finding for dealing with self-care for diabetic patients.

According to results in (Table 4-3d), the control group did not show any changes in terms of self-care. The study findings show that there is no enhancement in patients self-care at post-test in comparison with pre-test scores because the control group at post-test had the same results regarding self-care and there was no statistically significant difference between the control group overall responses in two periods of measurements (pre-test and post-test). Although such patient might occasionally obtain information from sources other

than the specific investigator, it could not occur in this work for unknown reasons. In contrast, the study group findings, which are presented in Table 4-4d, show that the study group demonstrated high levels of self-care at the post-test, almost all post-test responses were at a good self-care level, and there was a highly significant differences between the study group's overall responses in the two periods of measurements (post-test and pre-test) at a p-value test (0.001) <0.05. These findings suggest that the patients' self-care at the post-test has improvement in comparison with pre-test scores. this finding showed that this study's instructional program has been successful and might benefit intervention group by improving all aspects of self-care. This may be done to improve quality of life for diabetic people and reduce the complications associated with diabetes.

The results in table (4-4d) shows that there is a high-significant difference between the pre-test and post-test I at p-value 0.001, while there is non-significant difference between the post-test I and post-test II at p-value less than 0.259.

Table (4-5) results demonstrate that there is a non-significant difference between control and study groups in pre-test at p-value test (0.208) >0.05, while there is a highly significant difference between control and study groups at post-test with p-value test (0.001) <0.05. When comparison the study with the control group, the study group reactions improved after the program was applied, according to the statistical mean.

Those findings are similar to those of the study by Dinar et al. (2019), which examined the impact of diabetes education on self-care and diabetes management amongst the diabetic patients at the King Fahad Hospital in Al-Baha. That demonstrated a significant improvement in the diabetes self-care scale following intervention, going from 2.4 to 3.3.

Additionally, this finding is supported by (Konstantinos, 2018) study was showed diabetes self-care activities of the intervention group score showed an improved difference between pre and post-program exercise (3.10 to 3.23), diet (4.2 to 4.6), foot care (2.18 to 2.33), medication (6.8 to 7.0), and blood glucose test (6.53 to 6.8) are the most important factors. Whereas there are no noticeable changes for the control group, they remain at the same level.

Also study conducted byAbubakr et al., (2020) supported our findings, and there were inadequate self-care activities performed by the patients before the awareness but improved after that. The researchers hypothesized that these individuals were responding to this awareness as a red alarm. The results of this work confirm the ongoing need for increased diabetes education geared toward enhancing self-care practices among diabetics.

Moreover, In a cluster randomized controlled trial in primary care, Khunti *et al*. (2012) have examined efficacy of diabetes education and self-management program (DESMOND) for patients with newly diagnosed T2DM. They discover that patients in intervention group perform better on the post-test in comparison with pre-test scores than patients in control group (non-intervention group).

Also, this finding is supported by study Jaililan *et al*., (2014) that examined the evaluation of the efficacy of a self-management promotion educational program among the diabetic patients. They discover that average response for the severity, benefit, susceptibility and self-management among the intervention group has significantly improved. Among the intervention group, the average response to self-management barrier reduced following intervention. This indicates that the education program is crucial for improving DM patients' knowledge on self-care.

Another study supported finding done by Cani et al. (2014), that find that knowledge of diabetes, medications, correct insulin injection method, medication adherence, and home blood glucose monitoring methods considerably enhanced in the intervention group, also remained unchanged in control group. At the conclusion of the study, mean HbA1c values in intervention group have been considerably lower than the ones in the control group, which remained unchanged. The quality of life associated with diabetes dramatically enhanced in intervention group, yet considerably declined in the control group. This outcome demonstrates the value of an education program for the patients, particularly for the individuals who have some chronic illnesses like the DM.

Part IV: Relationship between demographical and clinical data with instructional program on self-care for T2DM patients:

Tables (4-6) (4-7) and (4-8): show that there is a significant relationship between the patient's self-care activities and their (age, marital status, levels of education, monthly income, do you receive an education and complications), while there is a non-significant relationship with other demographic and clinical data.

Regarding complications, there was non-significant between eye complications, renal complications and hepatic complications with patient's knowledge about type II diabetes self-care p-value (0.375) (0.319) and (0.439) respectively. While the neurological complications and diabetic foot of the sample shows there was significant difference at P-value (0.043) and (0.013) respectively less than 0.05.

This finding was consistent with a study that has been carried out by Bhatti *et al*., (2018) entitled as "impacts of socio-demographic factors on self-

care practices among patients with type II diabetes in Lahore, Pakistan," which found that the performance of suggested self-care was related to socio-demographic factors including age, educational attainment, marital status, and household income per month.

Berhe *et al*., (2013), Singh & Viji (2014), and Freitas *et al*., (2014) studies provide support for this study findings. They stated that patients' education levels had a highly substantial impact on their self-care behaviors. The study finding disagree with Frietas *et al*., (2014) and Mohebi *et al*., (2014), the association between the patient's monthly income, age, and self-care activities is not statistically significant.

In additional, this result similar to study conducted by Mahalakshmy and Arulmozhi (2014) as well as Kueh et al., (2014) that showed the gender of the patient has no significant impact on their self-care behaviors. Those findings may also be attributed to the study sample's homogeneity in terms of knowledge due to the fact that they visit the same center for management and follow-up. Thus, they receive same health education and information about their medical issues from this institution. As a result, neither their place of residence nor their cultural differences have an impact on their participation in self-care activities. For the same reason, neither has their occupation.

Moreover, this result is comparable to study done by Hamza and Mohammed-Ali, (2016) that found a non-significant relation between other demographic and clinical data (age, gender, occupation, marital status, duration of disease and residency) and patient self-care activities, whereas a highly significant relation was found between those variables (level of education) and patient self-care activities. Also the results study agree with the results of the study done by Jackson et al., (2014) that observed the Self-care knowledge was associated with level of education ($p<0.001$) and monthly income ($p<0.001$).

The patients' adherence to the self-care activities will decrease the incidence of complications, so the study results reveal that there is a significant relationship between self-care activities and complications. Furthermore, the study results reveal that there is a non-significant relationship between the patients' self-care activities and (duration of disease, heredity). These results might show because the study sample are including patients who have duration of disease more than one year and the study did not include those who have less than one year in the sample, also patients will be more stable after one year due to adherence to the self-care activities during that year, and their activities toward control of their disease is still relatively constant (the researcher).

Chapter Six
Conclusions and Recommendations

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6.1. Conclusions:

6. 1. 1. There is relationship between the patients self-care activities and their (age, marital status, levels of education, monthly income, receive of education, and complications), but there is no relationship with other demographic and clinical variables.

6. 1. 2. The study concludes that instructional guideline is effective to improve diabetes patients' self-care activities among those with type 2 diabetes.

6. 1. 3. Accepting the alternative hypothesis and supported by the findings of our study, which demonstrate significant differences between pre-intervention and post-intervention conditions. The diabetes self-care scale showed that improved self-care among diabetic patients after intervention significantly from 1.79±0.360 to 3.17±0.546 (P: 0.01).

6. 1. 4. The results of this study show the efficiency of instructional program in enhancing T2DM patients' self-management activities and self-care practices through the reinforcement of disease information and the promotion of self-efficacy. The slight decline observed during the phase of follow-up indicates the need for periodic dosing of the intervention.

6.2. Recommendations:

Based on the results and conclusions of the present study, the researcher recommends the following:

6.2.1. An instructional program should be designed and implemented to increase patients' information about self-care regimen for diabetes mellitus in order to reduce or prevent complications

6.2.2. Encourage the health care provider to improve diabetic patients' self-care activities and focusing on all domain aspects of self-care.

6.2.3. To increase knowledge and improve self-care for type 2 diabetics, patients need full understanding, confidence and support from families because some of the patients depend on their families to do so. In additional, follow systematic health care through the use of modern management policy because diabetes is a chronic disease and because many complications so need to support with social and economic resources.

6.2.4. According to previous and current studies, diabetes will increase in the future years, and this requires more studies on diabetes and its complications. So the researcher suggests conducting research with larger samples and determining the results of the self-care of diabetic type 2.

6.2.5. The ministry of health should get attention to the availability of active sessions to educate diabetes patients on how to cope with their disease and improve patients' awareness about the method of healthy coping.

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Appendices

APPENDIX A1

وزارة الصحة
دائرة صحة الديوانية
قسم التدريب والتنمية البشرية
شعبة ادارة المعرفة والبحوث
قرار لجنة البحوث

استمارة رقم ٠٢ / ٢٠٢١
رقم القرار: ٥٩
تاريخ القرار : ٢٠٢٢/٨/١٤

قرار لجنة البحوث

درست لجنة البحوث في دائرة صحة الديوانية مشروع البحث المقدم من قبل السيد الباحث (علاء حمزة حرمس جبار) طالب الدكتوراه في جامعة بابل / كلية التمريض ، لغرض اجراء اكمال الجانب العملي في البحث ، علماً ان عنوان البحث :-

(Effectiveness of self-care instructional program for adult patients on controlling type II diabetes mellitus in al-diwaniyah teaching hospital)

والمقدم من قبل الباحث الى قسم التدريب والتنمية البشرية /شعبة ادارة المعرفة والبحوث / لجنة البحوث في دائرة صحة الديوانية بتأريخ ٢٠٢٢/٨/١٤ قررت اللجنة :-

قبول مشروع البحث اعلاه كونه مستوفياً للمعايير المعتمدة في وزارة الصحة والخاصة بتنفيذ البحوث ولا مانع لدينا من تنفيذه .

المرفقات / تعديلات وملاحظات لجنة البحوث / لايوجد

البحث مستوفي الشروط العلمية ومطابق لأخلاقيات البحث العلمي

ولامانع لدينا من أجراء البحث في (مستشفى الديوانية التعليمي).

رئيس لجنة البحوث
الطبيب الاختصاص/ د.يحيى فالح محمد
٢٠٢٢ /٨/١٤

APPENDIX A2

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

العدد : ٧ ٥٠٧
التاريخ : ١٤/ ٧/ ٢٠٢٢

Ref. No. :
Date :

الى / دائرة صحة الديوانية / مستشفى الديوانية التعليمي
م/ تسهيل مهمة

تحية طيبة :

يطيب لنا حسن التواصل معكم ويرجى تفضلكم بتسهيل مهمة طالب الدكتوراه (علاء حمزة حرمس جبار) لغرض جمع عينة دراسة الدكتوراه والخاصة بالبحث الموسوم :
(فعالية البرنامج الارشادي لرعاية الذاتية لمرضى البالغين لسيطرة على مرض السكري من النوع الثاني في مستشفى الديوانية التعليمي) .

(effectiveness of self-care instructional program for adult patients on controlling type ii diabetes mellitus in al-diwaniyah teaching hospital)

... مع الاحترام ...

المرفقات //
- بروتوكول .
- استمارة

أ.م . د. نهى محمد قاسم الدوري
معاون العميد لشؤون العلمية والدراسات العليا
٢٠٢٢ / ٧ / ١٤

صورة عنه الى //
- مكتب السيد العميد للتفضل بالاطلاع مع الاحترام .
- لجنة الدراسات العليا
- الصادرة .

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APPENDIX A3

جمهورية العراق
محافظة الديوانية
دائرة صحة الديوانية
قسم تدريب وتطوير الملاكات
العدد / ٧٨٠
التاريخ / ١٤ /٨/ ٢٠٢٢

وزارة الصحة العراقية
مركز التدريب والتطوير
Iraqi Ministry of Health
Training & Dev. Center

دائرة صحة الديوانية
قسم التدريب والتنمية البشرية
الصادرة
التاريخ / /

إلى / مستشفى الديوانية التعليمي

م / تسهيل مهمة بحثية

تحياتي طيب تحيات...

كتاب جامعة الكوفة /كلية الصيدلة ذي العدد ٢٥٠٧ في ٢٠٢٢/٧/٢٦ ،المتضمن تسهيل مهمة طالب الماجستير(علاء حمزة حرمس جبار) ،لغرض جمع العينة البحثية في مستشفى الديوانية التعليمي بأطروحته الموسومة:-

(Effectiveness of self-care instructional program for adult patients on controlling type II diabetes mellitus in al-diwaniyah teaching hospital)

لامانه لدينا من اجراء بحثة على ان لاتتحمل مؤسستكم اي تبعات مالية او قانونية من جراء البحث

مع الاحترام

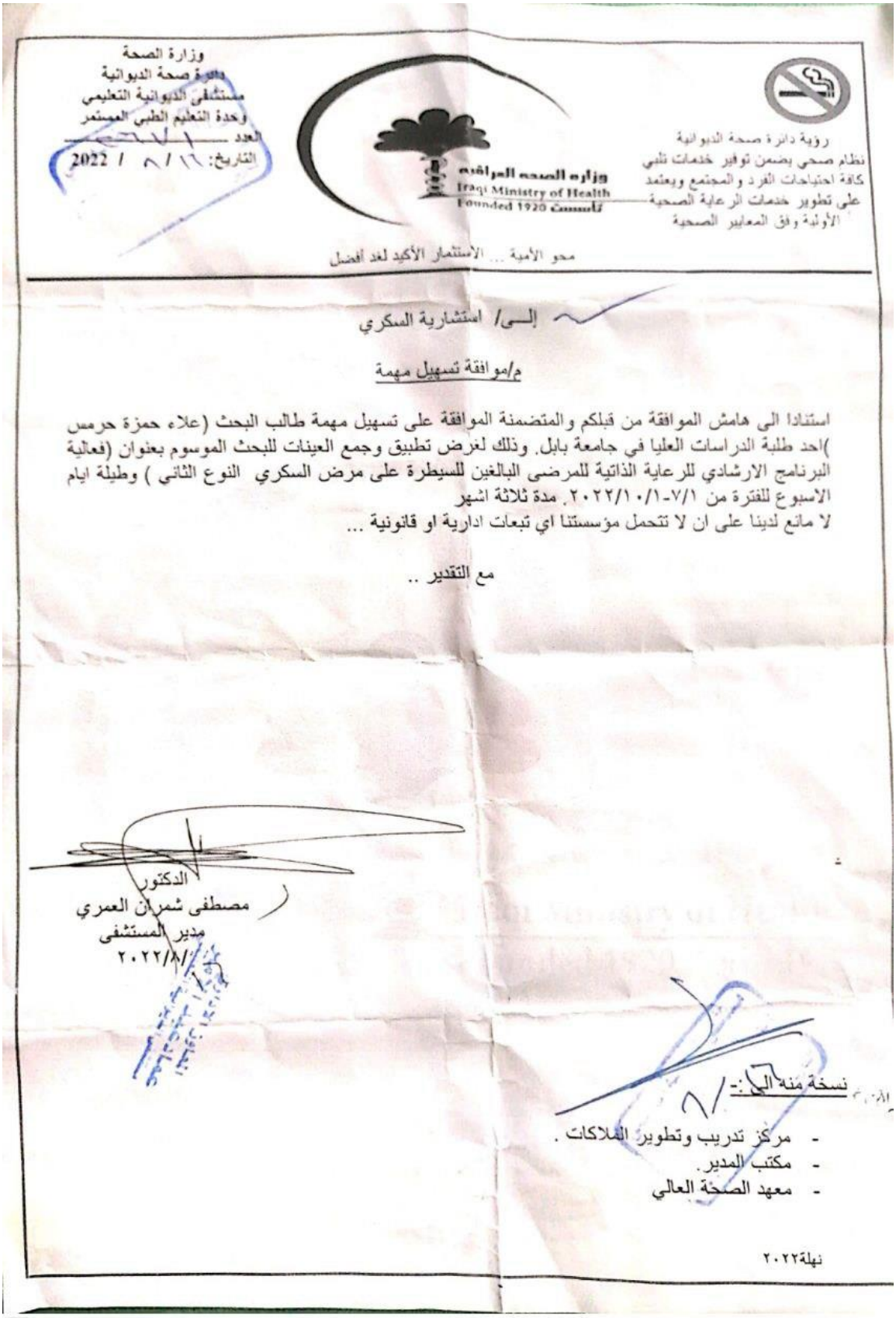
المرفقات/ كتاب جامعة بابل /كلية التمريض /لجنة الدراسات العليا ذي العدد ٢٥٠٧ في ٢٠٢٢/٧/٢٦
استمارة المعلومات البحثية + اقرار بحث

الطبيب الاختصاص
يحيى فالح محمد
مدير قسم التدريب والتنمية البشرية
٢٠٢٢/ /

نسخة منه الى //
قسم التدريب والتنمية البشرية / شعبة ادارة المعرفة والبحوث
جامعة بابل / كلية التمريض /لجنة الدراسات العليا

برهان الدين عبد الكريم العبودي

APPENDIX A4



وزارة الصحة
دائرة صحة الديوانية
مستشفى الديوانية التعليمي
وحدة التعليم الطبي المستمر
العدد: ـــــ
التاريخ: ١٦ / ٨ / 2022

وزارة الصحة العراقية
Iraqi Ministry of Health
Founded 1920 تأسست

رؤية دائرة صحة الديوانية
نظام صحي يضمن توفير خدمات تلبي
كافة احتياجات الفرد والمجتمع ويعتمد
على تطوير خدمات الرعاية الصحية
الأولية وفق المعايير الصحية

محو الأمية ... الاستثمار الأكيد لغد أفضل

إلـــى/ استشارية السكري

م/موافقة تسهيل مهمة

استنادا الى هامش الموافقة من قبلكم والمتضمنة الموافقة على تسهيل مهمة طالب البحث (علاء حمزة حرمس)احد طلبة الدراسات العليا في جامعة بابل. وذلك لغرض تطبيق وجمع العينات للبحث الموسوم بعنوان (فعالية البرنامج الارشادي للرعاية الذاتية للمرضى البالغين للسيطرة على مرض السكري النوع الثاني) وطيلة ايام الاسبوع للفترة من ٢٠٢٢/١٠/١-٧/١ مدة ثلاثة اشهر
لا مانع لدينا على ان لا تتحمل مؤسستنا اي تبعات ادارية او قانونية ...

مع التقدير ..

الدكتور
مصطفى شمران العمري
مدير المستشفى
٢٠٢٢/٨/١٦

نسخة منه الى:-
- مركز تدريب وتطوير الملاكات .
- مكتب المدير.
- معهد الصحة العالي

نهلة٢٠٢٢

APPENDIX B

التقييم الاولي (استمارة تقييم حاجات مرضى السكري)

(Initial assessment need)

ت	السؤال	نعم	%	لا	%
١.	هل تتبع نظام غذائي متوازن يوميا	٣٠	٣٠	٧٠	٧٠
٢.	هل تمارس الرياضة حتى اذا كنت متعب	١٠	١٠	٩٠	٩٠
٣.	هل تتناول بعض الطعام قبل ان تمارس الرياضة	٣٠	٣٠	٧٠	٧٠
٤.	هل ترتدي جوارب قطنية فضفاضة (واسعة) في كل مرة تسير فيها (بما في ذلك المشي داخل المنزل)	٤٠	٤٠	٦٠	٦٠
٥.	هل تقص أظافر قدمك في خط مستقيم وعدم إزالة جوانب الأظافر بطريقة مناسبة	٣٠	٣٠	٧٠	٧٠
٦.	هل تعتقد ان العناية بالقدم يجنبك من الاصابة بالقدم السكري	٤٠	٤٠	٦٠	٦٠
٧.	هل تعتقد اجراء فحوصات منتظمة مع طبيبك يساعدك على اكتشاف العلامات المبكرة لمضاعفات السكري	٢٠	٢٠	٨٠	٨٠
٨.	هل تزور طبيبك بصورة منتظمة	١٠	١٠	٩٠	٩٠
٩.	هل قرات بحثا او كتاب او بحثت علي شبكة النت عن مرض السكري والعناية به	١٠	١٠	٩٠	٩٠
١٠.	هل تفرش اسنانك بعد كل وجبة طعام	٢٠	٢٠	٨٠	٨٠

APPENDIX C1

الجزء الاول: المعلومات الديموغرافية

١. **العمر** ☐ **سنة**

٢. **الجنس:**

ذكر ☐ **أنثى** ☐

٣. **الحالة الزوجية**

اعزب ☐ متزوج ☐ منفصل ☐ مطلق ☐ ارمل ☐

٤. **المستوى التعليمي:**

لا يقرأ ولا يكتب ☐ يقرأ ويكتب ☐

خريج الدراسة الابتدائية ☐ خريج الدراسة المتوسطة ☐

خريج الدراسة الإعدادية ☐ خريج معهد ☐

خريج كلية ☐

٥. **المهنة**

موظف ☐ كاسب ☐ لا أعمل ☐

طالب ☐ متقاعد ☐ ربة بيت ☐

٦. **الدخل الشهري للأسرة :**

☐ لا يكفي ☐ يكفي نوعا ما ☐ يكفي

الجزء الثاني: المعلومات السريرية

١. **حالة التدخين**

مدخن ☐ غير مدخن ☐ مدخن سابق ☐

٢. فترة الاصابة بالسكري

- اقل من ٣ سنوات ☐
- من ٣-٦ سنة ☐
- من ٧-١٠ سنة ☐

٣. نوع العلاج

- مضادات السكر عن طريق الفم ☐
- الأنسولين ☐
- مضادات السكر عن طريق الفم والأنسولين ☐
- مضادات السكر عن طريق الفم قبل والأنسولين الآن ☐

٤. هل تلقيت برنامجا تعليمًا حول العناية بداء السكري (الرعاية الذاتية)؟

نعم ☐ لا ☐

٥. تاريخ العائلة لداء السكري

- لا أحد ☐
- التاريخ السابق للمرض من جانب الأب؟ نعم ☐ لا ☐
- التاريخ السابق للمرض من جانب الأم؟ نعم ☐ لا ☐

٦. هل لديك مضاعفات من داء السكري

- لا توجد مضاعفات ☐
- مضاعفات عصبية ☐
- مضاعفات القلب والأوعية الدموية ☐
- مضاعفات العين ☐
- مضاعفات القدم السكرية ☐
- مضاعفات في الكلية ☐
- مضاعفات في الكبد ☐

٧. قياس كتلة الجسم

الطول .....

الوزن.....

الجزء الثالث: مقياس الرعاية الذاتية لمرضى السكري النوع الثاني

ت	السؤال	ابدا	احيانا	بشكل متكرر	دائما
١.	أتناول وجباتي في نفس الوقت كل يوم				
٢.	دائما آكل وجباتي الخفيفة				
٣.	التزم بنظامي الغذائي عندما أتناول الطعام بالخارج في المطاعم				
٤.	ألتزم بنظامي الغذائي عندما أذهب إلى الدعوات (للآخرين والأصدقاء والاجتماعات)				
٥.	ابقى ملتزما بالحمية الغذائية حتى ان الاشخاص المقربين مني حذروني انني لم اكن اعرف بأني مصاب بالسكري				
٦.	لا آكل بشكل مفرط				
٧.	أمارس الرياضة بانتظام				
٨.	أمارس تماريني حتى عندما لا أشعر بالرغبة في ممارسة الرياضة				
٩.	أمارس الرياضة بشكل كافٍ				
١٠.	أقيس نسبة السكر في دمي				
١١.	احتفظ بسجلات لقياسات السكر في دمي				
١٢.	أتناول الأدوية المضادة للسكري عن طريق الفم على النحو الموصى به				
١٣.	أتناول حقن الأنسولين الخاصة بي على النحو الموصى به				
١٤.	أقوم بتعديل جرعة الأنسولين وفقًا لقياسات السكر في الدم				
١٥.	احتفظ بقطعة من السكر معي عندما أكون خارج المنزل / بعيدًا عن المنزل				
١٦.	أتناول قطعة من السكر عندما ينخفض سكر الدم				
١٧.	أذهب بصورة منتظمة وأرى طبيبي				
١٨.	أستشير طبيبي عندما يرتفع مستوى السكر في دمي بشكل كبير.				
١٩.	أستشير طبيبي عندما ينخفض مستوى				

	السكر في دمي بشكل كبير.				
٢٠.	أفحص قدمي بانتظام.				
٢١.	أرتدي دائما الحذاء ، مهما يكلف الأمر، خارج المنزل.				
٢٢.	أرتدي دائمًا شبشبًا (خف) أو حذاءًا منزليًا عندما أكون داخل المنزل				
٢٣.	دائما أرتدي الجوارب				
٢٤.	أبقي أظافري قصيرة ومستقيمة				
٢٥.	انظف أسناني كل يوم.				
٢٦.	أحمل على عاتقي بطاقة تعريف خاصة بمرض السكري.				
٢٧.	أتحدث مع مرضى السكري الآخرين حول كيفية اهتمامهم بأنفسهم				
٢٨.	أستشير الممرضات والأطباء وغيرهم من مقدمي الرعاية الصحية / المتخصصين حول كيفية منع المضاعفات.				
٢٩.	قرأت المنشورات والكتيبات عن مرض السكري عند إعطائي.				
٣٠.	أقوم بإجراء بحث على الإنترنت للعثور على معلومات حول مرض السكري.				
٣١.	استخدم الأشياء التي أتعلمها لتجنب أي مضاعفات يمكن أن تحدث بشأن مرض السكري.				

APPENDIX C2

Part I: Demographic Data:

1. **Age (years)** ☐
2. **Gender**

Male Female

3. **Marital status**

Single ☐ Married ☐ Separated ☐

Divorced ☐ Widowed ☐

4. **Education Level**

Unable to Read and Write ☐

Read and Write ☐

Primary school Graduate ☐

Intermediate school Graduate ☐

Secondary school Graduate ☐

Institute Graduate ☐ College Graduate ☐

5. **Occupation**

Employee ☐ free businessman ☐

Unemployed ☐ Student ☐

Retired ☐ Housewife ☐

6. **Income** ☐

Sufficient ☐ Barely Sufficien ☐ Not Sufficient ☐

7. **Residency**

Urban ☐ Rural ☐

Part II: Clinical Data:

1. **Smoking status**

   Smoker ☐ Non-Smoker ☐ Ex-Smoker ☐

2. **Disease duration since diagnosis**

   Less than 3 years ☐

   3-6 years ☐

   7-10 years ☐

   More than 10 years ☐

3. **Type of treatment**

   Oral antidiabetics ☐

   Insulin ☐

   Oral antidiabetics & insulin ☐

   Oral antidiabetics before and insulin now ☐

4. **Do you receive an education about diabetes management self-care** ?

   Yes 1 ☐ No **2** ☐

5. **Family diabetes history**

   - None
   - Past history of disease from father side? Yes ☐ No ☐
   - Past history of disease from mother side? Yes ☐ No ☐

6. **Have DM complications**

   None ☐ Eye complications ☐

   Neurological complications ☐ Diabetic foot ☐

   Renal complications ☐ Hepatic complications ☐

   cardiovascular complications ☐

7. **Body mass index**

   Height……. **weight……**

Part III: Diabetes self-care among of diabetic patients

No.	Items	Never	Sometimes	Frequently	Always
1	I eat my meals at the same time everyday				
2	I always eat my snacks				
3	I keep bound to my diet when I eat out in the restaurants				
4	I stick to my diet when I go to invitations (to others, friends, meetings				
5	I keep bound to my diet even when the people around me bound I do not know I am diabetic				
6	I do not eat excessively				
7	I do exercise regularly				
8	I do my exercises even when I don’t feel like exercising				
9	I do exercise adequately				
10	I measure my blood sugar				
11	I keep records of my blood sugar measurements				
12	I take my oral anti diabetic drugs as recommended				
13	I take my insulin injections as recommended				
14	I adjust my insulin dosage according to my blood sugar				

	measurements				
15	I keep a lump sugar with me when I'm out/away from home				
16	I eat a lump sugar when my blood sugar drops				
17	I regularly go and see my doctor				
18	I consult my doctor when my blood sugar level rises extremely.				
19	I consult my doctor when my blood sugar level drops extremely.				
20	I regularly check my feet.				
21	I always wear shoes, by all means, outside of the house.				
22	I always wear a slipper or a house-shoe when inside the house				
23	I always wear socks.				
24	I keep my toenails short and straight.				
25	I brush my teeth every day.				
26	I carry a diabetes identification card on me.				
27	I talk with the other diabetes patients about how they care for themselves				
28	I consult nurses, doctors, and				

	other health care providers/specialists about how to prevent complications.				
29	I read the hand-outs and brochures about diabetes, when given.				
30	I do research on the internet to find information about diabetes.				
31	Use the things I learn to avoid any complications that can occur about diabetes.				

APPENDIX D

جامعة بابل

كلية التمريض

فاعلية البرنامج الارشادي بالعناية الذاتية للمرضى البالغين للسيطرة على السكري- النوع الثاني في مستشفى الديوانية التعليمي

٢٠٢١-٢٠٢٢

إعداد

طالب الدكتوراة : علاء حمزة حرمس

بإشراف

أ.د: فخرية جبر محيبس

البرنامج العناية الذاتية الارشادي لمرضى السكري من النوع الثاني

يعتبر داء السكري من اكثر التحديات الصحية في القرن الواحد والعشرين حيث اصبح وباء مستنزفا للموارد البشرية والمادية ويهدد الدول المتطورة والنامية على ح د سواء , اذ ان المضاعفات الناجمة عنه كأمراض القلب والشرايين والفشل الكلوي والاعتلال العصبي وبتر القدم والعمى تودي جميعها الى درجات متفاوتة من العجز وانخفاض مستوى الحياة لدى الفرد وزيادة الأعباء الاقتصادية على الفرد و الآسرة والمجتمع .وحسب تقرير لمنظمة الصحة العالمية أظهر أن التعليم والتدريب والتثقيف من خالل برامج مصممة خصيصاً لمرضى السكري قد حقق الآتي

1 -خفض نسبة حدوث المضاعفات القصيرة وطويلة الأجل

2 . خفض نسبة حدوث بتر الأطراف السفلية

3 .زيادة الوعي الذاتي بالمسؤولية وتقبل المرض ودمجه في الحياة اليومية.

4 .خفض التكاليف الطبية والاجتماعية للمرض.

5 .خفض نسبة التغيب عن العمل والمدرسة.

6 . تخفيف الشعور بالعزلة أو الاختلاف عن الآخرين.

7. يقلل من عدد مرات الدخول للمستشفى ويقلل الإقامة فيها

المحاضرة الأولى: مقدمة عن داء السكري النوع الثاني

الأهداف:

١. تعريف المشاركين بمرض داء السكري النوع الثاني.
٢. تعريف المشاركين بآلية الإصابة والعوامل والاسباب التي تزيد من فرص الإصابة بداء السكري من النوع الثاني.
٣. توضيح العلامات والأعراض والمضاعفات الخاصة بداء السكري من النوع الثاني.
٤. توضيح طرق الكشف عن داء السكري وطرق الوقاية منه.

مكان المحاضرة: مركز أمراض السكري والغدد الصماء في مدينة الديوانية.

مدة المحاضرة: ٤٥ دقيقة

الوسائل التعليمية المستخدمة:

محاضرة على الورق

بروشور

وسائل الإيضاح

السبورة

جهاز الحاسوب

المقدمة

مرض السكري هو مرض مزمن يتميز بزيادة مستوى السكر في الدم نتيجة لنقص نسبي أو كامل في الأنسولين الذي يفرزه البنكرياس إلى الدم, أو لخلل في قوة تأثير الأنسولين على الأنسجة التي تستهلك الغلوكوز مثل العضلات والنسيج الدهني والكبد, وينتج عن هذا الارتفاع المتكرر مضاعفات مزمنة في أعضاء مختلفة من الجسم

مرض السكري من الأمراض المزمنة الخطيرة التي تواجه المجتمع العراقي بل العالم كله ولأجل ذلك تم بناء وعرض هذا البرنامج ليكون دليل عمل للمرضى المصابين بداء السكري وذلك لتمكينهم من القيام بالعناية الذاتية من خلال المحاضرات التي ستغطي أبرز الموضوعات ذات العلاقة بذلك.

داء السكري النوع الثاني

و يسمى بالسكري غير المعتمد على الأنسولين, ويتميز هذا النمط من السكري بوجود مقاومة للأنسولين من قبل الأنسجة المختزنة والمستهلكة لسكر الغلوكوز, كالكبد والعضلات والنسيج الشحمي في الجسم, فلا تستجيب له لإدخال جزيئات الغلوكوز من الدم إلى داخل خلاياها.

ما هو هرمون الانسولين

الأنسولين هو هرمون يساعد الجسم على استخدام الغلوكوز للحصول على الطاقة, ويتم إنتاجه من قبل خلايا بيتا في البنكرياس الذي يقع بين المعدة والعمود الفقري. ويفرز البنكرياس الأنسولين إلى مجرى الدم بعد تناول الشخص للطعام, وذلك استجابة لارتفاع السكر في مجرى الدم.. ويُدخل الأنسولين السكر الموجود في الدم (الغلوكوز) إلى الخلايا.

يشكل الغلوكوز الطاقة التي يتحول إليها الغذاء الذي يأكله الإنسان, ويفرز في الدم فتأخذه خاليا الجسم وتحرقه لإعطائها الطاقة اللازمة لعملياتها الحيوية. ولفعل ذلك فهي تحتاج لهرمون الأنسولين الذي يجعل الغلوكوز يتحرك من مجرى الدم إلى الخلايا.

كلما ارتفع مستوى الغلوكوز في الدم, أفرز البنكرياس كمية أكبر من الأنسولين لخفضه. أما إذا انخفض مستوى الغلوكوز فإن البنكرياس يقلل أو يوقف إفراز الأنسولين.

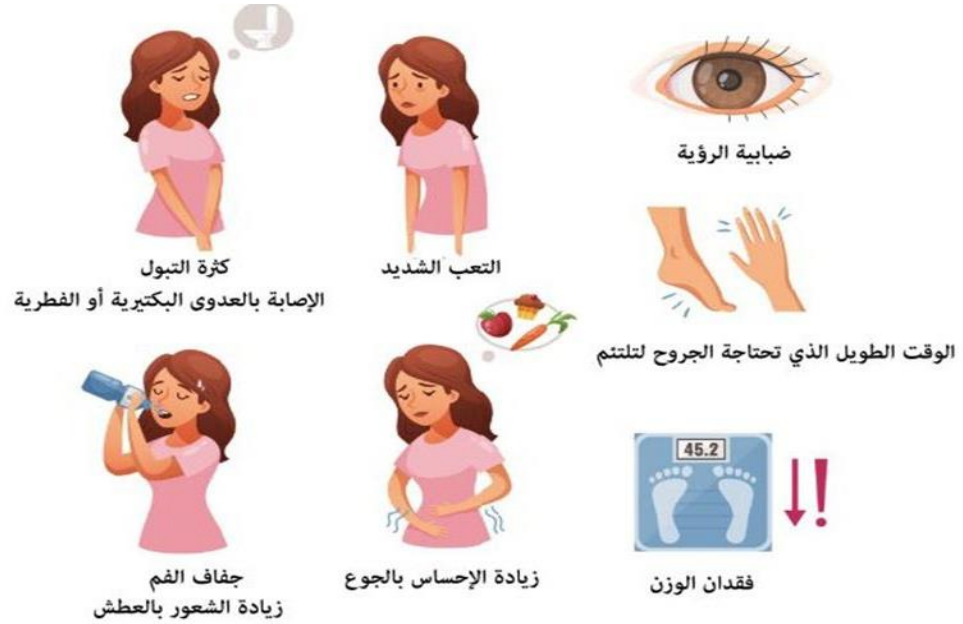
ويفرز البنكرياس هرمون آخر وهو الغلوكا كون حيث يُفرز من خلايا ألفا في البنكرياس و يعمل بشكل معاكس للأنسولين ويرفع سكر الدم .في الأحوال الطبيعية يحافظ الجسم على مستوى الغلوكوز في الدم بنطاق يتراوح بين ٧٠ و ١٢٠ مليغراما لكل ديسيلتر, وذلك عبر آلية تضمن الحفاظ على مستواه حتى لو صام الشخص مدة طويلة عن الطعام, أو بالعكس تناول كمية كبيرة منه .ويعمل الأنسولين والغلوكاغون معا للحفاظ على مستوى ثابت للغلوكوز في الدم, وتنظيم تزويد الجسم وخلاياه بالطاقة.

ما هي أ سباب والعوامل المساعدة علىالاصابة بالسكري النمط الثاني؟:

- **التاريخ العائلي للسكري**
- **زيادة الوزن والسمنة**
- **الجنس: الإناث أكثر من الذكور**
- **ارتفاع ضغط الدم**
- **ارتفاع مستوى الكولسترول والدهون الثلاثية في الدم**
- **الإصابة بسكر الحمل بالنسبة للمرأة**
- **نمط الحياة غير الصحي في الغذاء والنشاط البدني الخامل**

اعراض الإصابة بالسكري

- كثرة عدد مرات التبول مع خروج البول بكميات غزيرة في معظم أوقات اليوم
- عطش شديد وكثرة شرب الماء وانعدام الشعور بالارتواء
- جفاف الفم والجلد واللسان لدرجة التشقق
- حدوث الوهن والتعب وضعف القدرة على العمل بشكل متزايد
- تشوش القدرة على الرؤية الواضحة
- فقدان الوعي والغيبوبة بعد فترة طويلة ومستمرة من ارتفاع سكر الدم
- الجوع الدائم وعدم الشعور بالشبع على الرغم من امتلاء المعدة بالطعام
- تقيح الجروح بسهولة وصعوبة شفائها خصوصاً جروح القدمين



طريقة

تشخيص داء السكري من النوع الثاني:

وفقآ لجمعية السكري الأمريكية(ADA)، معايير التشخيص السكري من النوع الثاني هي على النحو التالي:

١- اختبار سكر الدم الصائم- Fasting Blood Glucose Test (FBG):
عدم تناول اي شيء لمدة ٨ ساعات او اكثر النسبة الطبيعية تكون مساوية او اكثر من (١٢٦ملغ/ديسيليتر) FBG ⩾ 126mg/dl.

٢- بعد ساعتين من الطعام تكون نسبة سكر الدم اكثر من ٢٠٠(ملغ/ديسيليتر)
٢٠٠ ملغ / ديسيلتر =2 hour post meal blood glucose

٣- اختبار الهيموغلوبين الغليكوزيلاتي (HbA1C): يقيس وجود الجلوكوز على مدى الأشهر الثلاثة إلى الأربعة الماضية.(HbA1c ⩾ 6.5 ٪48) .

٤- اختبار سكر الدم العشوائي(Random Blood Sugar Test (RBS : بغض النظر عن اخر فترة تناولت فيها الطعام فأن نسبه السكر في الدم تكون اكبر او تساوي ٢٠٠ ملغ / ديسيلتر (١١.١ ملليمول / لتر).

طريقة قياس نسبة السكر في الدم

- نغسل اليدين بالماء والصابون مع الحرص على استعمال الماء الفاتر، حيث يساعد على تدفق الدم في اليد مما يساهم في قراءة جيدة لنسبة السكر في الدم.
- نجفف اليد من الماء جيداً؛ لأن بقاء الماء على اليد سوف يتسبب في إعاقة عملية القياس.
- ندخل شريطاً من الأشرطة المدرجة في المكان المخصص في جهاز قياس السكر
- نجرح الأصبع جرحاً بسيطاً باستعمال مشرط صغير الحجم يأتي مع الجهاز عادةً.

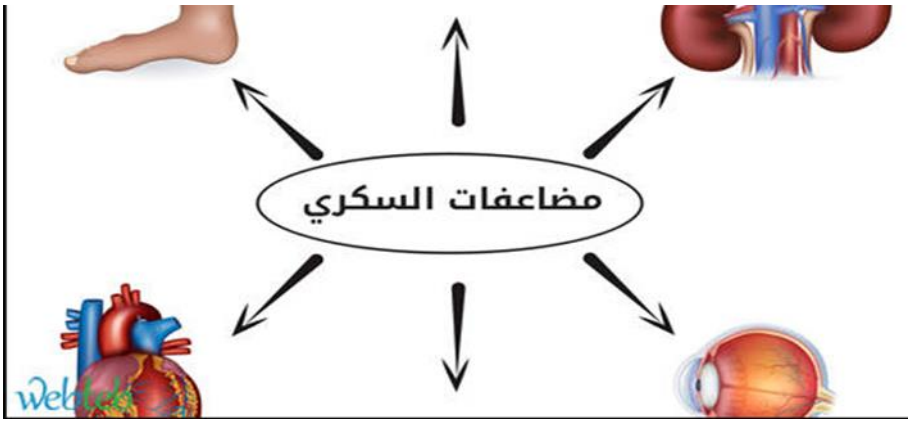
- نضغط على الأصبع برفق من أجل إخراج قطرة من الدم، ثم نضع قطرة الدم على الشريط المدرج.
- نتأكد من وصول الدم إلى الشريط الموضوع في جهاز قياس السكر.
- نحافظ على الوضعية في أثناء القيام بعملية القياس حتى تظهر النسبة على شاشة الجهاز.
- ندوّن النسب المستخرجة، ونتبع إرشادات الطبيب.
- نضبط ذاكره الجهاز من أجل حفظ النسب حتى يراها الطبيب من أجل المتابعة الصحية.
- نتخلص من المشرط المستعمل في جرح الأصبع حتى لا يتعرض أحد للخطر.
- نغسل الأصبع المجروح، ونطهره جيداً.

<u>مضاعفات السكري</u>

على الرغم من أن مرض السكري يُعتبر من الأمراض المزمنة, حيُث ال ي ماسه لعالجه والسيطُرة عليهُ ألسبا ب متعددة, أهمها: منع حدوث المضاعفات المصاحبة لهذا المرض, أو التخفيُف من حدة هذه المضاعفات إن حدثت, وذلك عن طريُق المحافظة على مستوى السكر في الدم ضمن المستوى الطبيُعي المطلوب ومن مضاعفات مرض السكري:

١- **الفشل الكلوي**
٢- **اعتلال شبكة العين , عمى , اعتام عدسة العين**
٣- **امراض القلب والشرايين (اعتلال عضلة القلب • احتشاء عضلة القلب • تصلب الشرايين • ارتفاع ضغط الدم).**
٤- **السكتة الدماغية , الاعتلال العصبي الذاتي, الاعتلال العصبي المحيطي**
٥- **الضعف الجنسي**

٦- **تأخر إفراغ المعدة (الإسهال , الإمساك , عسر الهضم)**
٧- **الغرغرينا وبتر القدم**



المحاضرة الثانية

عنوان المحاضرة: العناية الذاتية ونمط الحياة الصحيحة لمرضى السكري-النوع الثاني

الأهداف:

في نهاية الجلسة يكون المشارك قادرا على:

١. معرفة النظام الغذائي الصحي.
٢. تجنب العادات الغذائية الخاطئة
٣. فوائد ممارسة الرياضة بصورة صحيحة

مكان المحاضرة: مركز أمراض السكري والغدد الصماء في مستشفى الديوانية التعليمي في مدينة الديوانية.

مدة الجلسة : ٤٠ دقيقة

ما المقصود بالعناية الذاتية لمريض السكري ؟ وما هو الهدف من العناية الذاتية؟

الرعاية الذاتية لمرض السكري: عرفت الصحة العالمية في عام ٢٠٠٩ الرعاية الذاتية بأنها "الأنشطة التي يقوم بها الأفراد والأسر والمجتمعات المحلية بهدف تعزيز الصحة والوقاية من الأمراض والحد من المرض واستعادة الصحة. ويتم القيام بها من قبل المرضى انفسهم، إما بصورة منفصلة أو بالتعاون مع مختصي الرعاية.

العناية الذاتية لمريض السكري من العناصر الأساسية للعناية الطبية. تتضمن تعليم المريض و تثقيفه عن طريقة أخذ العلاج و تغيير نمط الحياة و العادات الغذائية و قياس السكر في المنزل بحيث يتمكن من تنظيم معدلات السكر في الدم ليتجنب مضاعفات مرض السكري و يتمكن من التعامل مع المضاعفات الحادة الممكن حصولها بسبب ارتفاع أو انخفاض السكر في الدم و يكون متعاونا و متناغما مع الفريق

الطبي سعيا لهدف تحسين جودة حياته بطريقة تكون الأقل في التكلفه من النواحي المادية و في الوقت و المجهود.

مكونات الرعاية الذاتية في مرض السكري

- **الحمية الغذائية:**
- **الأنشطة البدنية (التمارين).**
- **الالتزام بالأدوية (بما في ذلك الإدارة الذاتية للأنسولين).**
- **المراقبة الذاتية للجلوكوز في الدم(SMBG)**
- **مهارة حل المشاكل(ارتفاع او انخفاض مستوى السكر في الدم).**
- **الحد من المخاطر (الإقلاع عن التدخين، العنايه في العين، القدم, والأسنان).**
- **التكيف الصحي (إدارة الإجهاد، والقضايا النفسية الاجتماعية والثقافية، والدعم الأسري والاجتماعي).**

الحمية الغذائية

النظام الغذائي للسكري هو نظام غذائي صحي لجميع الناس(الوجبات المنتظمة , مهمة جدا. تناول ثلاث وجبات في اليوم – الصباح، منتصف النهار والمساء. تجنب الفجوات الطويلة بين الوجبات.

يوصى بالإرشادات الصحية التالية في التغذية المتوازنة الموجهة الى شخص سواء مصابا بالسكري أو غير مصاب، وهي ترجمة عملية لأهداف الغذائية الصحية المشمولة بالهرم الغذائي:

١ .تناول طعاماً متنوعا للحصول على القدر الكافي من الفيتامينات والمعادن والألياف

٢ .تجنب الإفراط في تناول الدهون المشبعة والكوليسترول

٣ .تناول وجبات أصغر وتقسيم طعامك اليومي على ٤-٦ وجبات في اليوم

٤ .تناول اللحوم الأقل احتواء على الدهون المشبعة مثل لحم الدواجن والسمك

٥ .قلل من تناول اللحوم الحمراء لأنها أكثر احتواء على الدهون المشبعة

٦ .تجنب الأطعمة المقلية أو قلل منها قدر الامكان

٧ .تجنب الحساء الدسم

٨ .تجنب اللحوم الباردة والمعلبة لاحتوائها على الدهون بكميات كبيرة ومواد حافظة

٩ .قلل من تناول منتجات الألبان كاملة الدسم

١٠ .تجنب الإفراط في تناول ملح الطعام

١١ .تناول الأطعمة التي تحتوي على الألياف

١٢ .أكثر من تناول الفواكه والخضار الطازجة

١٣ .قلل من تناول السكر المكرر(سكر المائدة)

١٤ .تجنب المأكولات المصنعة الغنية بالسكر المركز والدهون

١٥ .تجنب الكحول تماما

١٦ .تناول الزيوت غير المشبعة بدلا من الدهون المشبعة

١٧ .تناول يوميا ما ال يقل عن ١٢ ً كوبا من الماء

١٨ .تجنب المآكل المعلبة الغنية بالصوديوم

تغير النمط الحياة الغير صحي

أين تكمن مشكلة مريض السكري من الناحية الغذائية والحياة اليومية المعتاد عليها ؟

١. في أنه لم يكن لديه نظام ثابت للوجبات الغذائية قبل ظهور الإصابة السكرية لديه
٢. لم يكن يوزع وجباتة الغذائية على وجبات متعددة في اليوم، بل كان يجمعها في وجبة واحدة متخمة أو وجبتين .

٣. أن المريض يتمسك بعادات وسلوكيات غذائية غير صحية معتقدا أنها صحيحة، كأن يتناول الدسم والدهون بكثرة، أو أن يتناول كمية كبيرة من اللحوم في وجبة واحدة

٤. أنه يتوجب على المريض أن يعي الفترة الزمنية بين تأثير الأدوية الخافضة لسكر الدم التي يتناولها أو يحقنها وموعد تناول الوجبة الغذائية

٥. يجب أن يعي الفترة الزمنية بين الجهد البدني والدواء والغذاء.

٦. أنه يربط موعد الطعام بالشعور بالجوع عادة ولا يعي أن آلية الجوع الطبيعية قد أصبحت مضطربة بسبب الإصابة بمرض السكري

٧. اعتقاد المريض أن النظام الغذائي العلاجي هو الحمية، وأن الحمية تعني الجوع والحرمان

<u>خطوات لتنظيم الغذائي وإعداد الغذاء الصحي</u>

١ .تحديد الوزن المثالي للشخص السكري

٢ .تحديد كمية السعرات الحرارية اللازمة للمصاب السكري يوميا

٣ .توزيع كمية (السعرات الحرارية) على العناصر الغذائية المختلفة من كربوهيدرات وبروتين ودهون، ثم حساب الكميات الوزنية من كل عنصرغذائي، ثم توزيع الكميات على الوجبات الرئيسية والوجبات الخفيفة.

٤ .استعمال قوائم البدائل الغذائية الاختيار نوع وكمية الطعام لكل وجبة من الوجبات اليومية، ويتم وضع الوصفة الغذائية بمساعدة الطبيب

ماذا تعمل في هبوط سكر الدم؟

يتطلب علاج هبوط سكر الدم دائما تدخلا فوريا بتناول المواد الكربوهيدراتية والسكرية بكميات معروفة تعمل على رفع سكر الدم فوق 100ملغ / د ل ودون ١٨٠ ملغ / د ل أما العلاج الإسعافي لحوادث هبوط سكر الدم فيكون كالتالي:

يمكنك استخدام ٣ أقراص جلوكوز (مثل ديكستروسول)

١ .يقدم الطعام فورا للمصاب الواعي، يقدم له شرابا محلى بالسكر، أو عصير فواكه أو شاي محلى بالسكر أو ماء مذاب فيه ملعقتان كبيرتان من السكر، ثم يراقب سكر دمه بعد ساعتين للتأكد من عدم هبوط سكر الدم مرة أخرى.

٢ .إذا كان المريض فاقدا للوعي، يطلى باطن فمه من جهة الخدين بالعسل أو الدبس أو القطر الصناعي أو بسائل المربى عدة مرات، فيعود له وعيه بعد عشر دقائق تقريبا.

٣ .إذا لم تنفع هذه الطرق في إعادة الوعي للمريض المصاب بهبوط سكر الدم يحقن بإبرة الجلوكاجون تحت الجلد أو في العضل أو بالوريد، ويستدعى الطبيب فورا أو ينقل إلى أقرب مستشفى وبأسرع ما يمكن.

٤ .يعطى الطفل فوق عمر ١١ سنة الجرعة الكاملة من محلول الجلوكاجون ١ ملغ، بينما يعطى الطفل الأقل من ذلك نصف الحقنة، أما الأطفال دون عمر الثلاث سنوات فيكفي إعطاؤهم ثلث الجرعة.

٥ .ويتم حقن محلول هرمون الجلوكاجون عضليا أو تحت الجلد أو تسريبا وريديا.

٧ .بعد عودة الوعي للمريض يعطى وجبة نشوية غنية بالسوائل والبروتين ويدفأ، ويراقب سكر دمه كل ساعة.

٨ .يفضل أن يدرب المريض ويثقف بأمور مرض السكري لمعالجة نفسه بنفسه فيتناول الطعام في الوقت الصحيح والمناسب ويعالج هبوط سكر دمه منذ بدء الأعراض الأولية دون تأخير.

النشاط البدني وممارسة التمارين الرياضية :

يتراوح النشاط الجسماني بين تحريك العضلات أثناء الجلوس في الكرسي وبين ممارسة الرياضة البدنية. وهناك وسائل متعددة لمن يعيشون حياة تخلو من الفعالية الجسمانية لزيادة نشاطهم البدني ولإعادة الثقة بقدراتهم على ممارسة هذا النشاط، مثال ذلك، القيام بمجهود عضلي أثناء العمل وعدم استخدام المصعد الكهربائي، ووضع السيارة في موقف بعيد عن موقع العمل لممارسة رياضة المشي كل يوم. هناك نوعان من الرياضة البدنية:

١ .**النوع الأول**: الرياضة الساكنة / التي تعتمد على شد العضلات وتعتمد على قوة الجهد، لمدة محدودة وينجم عن ذلك زيادة نمو بعض عضلات الجسم.

٢ .النوع الثاني: الرياضة المستمرة التي تعتمد على سرعة حركة العضلات

الاستعمال الأكسجين واستهلاك الطاقة وهو الغلوكوز، مثال ذلك، رياضة الجري والمشي السريع ، وهذا النوع من الرياضة يعطي الفائدة المطلوبة من التدريب المدروس على ممارسته.

<u>فوائد الرياضة البدنية:</u>

زيادة احتراق الكلوكوز

١ ـ عند الشخص غير المصاب بالسكري:

يزداد امتصاص العضلات لغلوكوز الدم كطاقة لحركة الشخص غير المصاب بالسكري. وقد لوحظ أن ممارسة رياضة الجري مثال تزيد في معدل امتصاص عضلات الرجلين لغلوكوز الدم حوالي ٧ – ٢٠ مرة فوق المعدل الأساسي. ويرافق هذه الزيادة في الامتصاص زيادة مشابهة في طرح الجلوكوز في الدم من الكبد، ولذا يبقى مستوى السكر في الدم ضمن الحدود الطبيعية.

٢ ـ عند الشخص السكري:

يلاحظ في الأشخاص المعالجين بالأنسولين كثرة حدوث نقص سكر الدم

عند ممارسة الرياضة البدنية لفترات غير قصيرة، نظرا لما تسببه الرياضة من زيادة امتصاص الأنسولين وتفعيل دوره من موقع الحقن تحت الجلد، خاصة إذا كان موقع الحقن ضمن الجزء المتحرك خلال ممارسـة الرياضـة .ولذلك يلاحظ ارتفاع مستوى الأنسولين في الدم في مثل هذه الحالة، مقابل انخفاض

مستوى السكر في الدم، مما يؤهب لحادثة نقص سكر الدم . ولتجنب ذلك، ينصح بحقن الأنسولين في البطن أو الذراعين بدل عن الفخذين للتخفيف من سرعة امتصاص الأنسولين الدوائي كإجراء ً وقائي على سبيل المثال. أن الوقاية من نقص سكر الدم تتضمن تناول وجبة إضافية من الكربوهيدرات قبل ممارسة الرياضة أو في منتصف مدة التمرين أو بعد التمرين. وإذا استمر حدوث النقص رغم ذلك تنقص جرعة الأنسولين التي يتوافق زمن تأثيرها مع فترة ممارسة الجهد البدني الرياضي .وعند تدريب المصاب بالسكري على ممارسة النشاط البدني على المدى الطويل فإن استجابة الجسم للأنسولين تزداد، وبالتالي تقل الحاجة للجرعة اللازمة للسيطرة على معدل السكر في الدم. وعكس ذلك صحيح، إذ أن الخمول وعدم الحركة يقللان من استقلاب الغلوكوز في الجسم بإدخاله إلى الخالي المستهلكة وتزيد من مقاومة الجسم لفعل الأنسولين (حتى عند الشخص غير المصاب بالسكري، وهذا من مسببات الحالة ما قبل السكري بشكل عام)

زيادة الكفاءة القلبية والتنفسية: يمكن للنشاط الرياضي البدني متوسط الشدة مثل المشي السريع أو السباحة أن تفيد بعض الشيء. ولكي يعطي هذا النشاط البدني فائدته فإن على أولئك القادرين ً أن يمارسوا نشاطا ً بدنيا كبيرا كافيا لرفع سرعة نبض القلب. وقد ثبت أن النشاط الرياضي المتزايد يقلل من حدوث الآزمة القلبية وأمراض الشرايين .

زيادة الكتلة العضلية والقدرة العضلية في الجسم : إن النشاط الجسماني، حتى لو كان متوسطا، يمنع ضمور العضلات الناجم عن نقص الفاعلية الفيزيائية في الحياة اليومية. ومن المعروف أن بروتينات العضلات تستهلك ثم يعاد بناؤها بمعدل يساوي ٢٠٠ غ في اليوم. ويؤدي نقص الفاعلية الفيزيائية في الحياة اليومية إلى انخفاض معدل إعادة بناء بروتينات العضلات، وبالتالي يفقد تدريجيا جزءا من التكوين العضلي، الا أن ذلك ربما لا يظهر بسبب تراكم الشحوم في نفس الوقت، ولكن الجسم يفقد قدرته على ممارسة أي نشاط عضلي بدني فاعل مستقبلا.

الفوائد النفسية للرياضة البدنية :كثيرا ما يلاحظ أن بعض مرضى السكري الذين يرغبون أو يستطيعون الاستمتاع بالنشاط الرياضي. ولكنهم عندما يتقدمون في الممارسة يشعرون بالسعادة ويلاحظ ايضا تحسن وظائف الجسم بالرياضة وخفة الحركة واستعادة مرونة المفاصل. وتناقص الإحساس بالخمول والكسل الذي ينتاب غير الرياضيين منهم .عندما يقرر المصاب بالسكري زيادة نشاطه اليومي فيجب عليه أن يفعل ذلك تدريجيا ولإحساس بالتعب والإرهاق الناجمين عن عنف النشاط الجسماني الزائد.

تعليمات مهمة للتمرين

- ✓ افحص نسبة السكر في الدم قبل وبعد التمرين لتفادي خطر الإصابة بنقص السكر في الدم.
- ✓ حافظ على السوائل(شرب الماء قبل التمرين وإثناءه وبعده أمرًا مهمًا لتقليل خطر الإصابة بالجفاف)

- ✓ اللباس المناسب (ارتدِ أحذية وجوارب مناسبة وملابس جيدة التهوية ومناسبة للطقس لمنع مشاكل القدم وضربة الشمس).
- ✓ تنفس بشكل طبيعي عند تدريب ، لا تحبس أنفاسك ، فقد يؤثر ذلك على ضغط دمك ويسبب لك الشعور بالدوار.
- ✓ ابدأ ببطء إذا كنت جديدًا في ممارسة الرياضة ، أو إذا كنت غير نشط لفترة طويلة

احذر من ممارسة ذلك

١ .ممارسة الأعمال البدنية المجهدة مثل الحفر ورفع الأوزان الثقيلة دون التزود بمواد كربوهيدراتية بفواصل زمنية مناسبة

٢ .مزاولة الجهد البدني المتعب قبل تناول الوجبة الطعامية الرئيسية أو الإضافية على الرغم من أخذ الدواء الخافض لسكر الدم أو الأنسولين

٣ .ممارسة العمل البدني الشديد وقت ذروة الأنسولين

المحاضرة الثالثة

عنوان المحاضرة: العناية الذاتية لقدم السكري والاستخدام الصحيح لأدوية السكري

الأهداف:

في نهاية الجلسة يكون المشارك قادرا على:

١. تعريف المرضى المشاركين بأهمية العناية بالقدمين
٢. تعريف المرضى المشاركين بكيفية العناية بالقدمين
٣. السيطرة على مضاعفات السكري على القدم
٤. تجنب العادات الخاطئة في استخدام ادوية السكر

مكان المحاضرة: مركز أمراض السكري والغدد الصماء في مستشفى الديوانية التعليمي في مدينة الديوانية.

مدة الجلسة: ٤٠ دقيقة

القدم السكرية:

تعتبر العناية بالقدمين من المتطلبات الصحية الضرورية لكل شخص وعندما يكون الشخص مصابا بالسكري تكون العناية بالقدمين اكثر ضرورةً لان مرض السكري يقلل من كمية تدفق الدم وقلة وصوله الى القدمين ومع مرور الوقت يفقد مريض السكري الشعور في القدمين فقد لا يشعر المريض بحصاة داخل الجوارب , مما قد يؤدي إلى جروح وقروح يمكن أن تؤدي الى مشاكل في القدم .فالعناية بالقدم

مهمة جًدا لجميع الأشخاص المصابين بداء السكري , ولكن أكثر من ذلك إذا كان هناك تغير في القدم أو أصابع القدم ,ألم , فقدان الشعور والإحساس, خدر , وخز فالجروح أو التقرحات على القدمين ال تُشفى بسهولة فكلما كان مريض السكري يعتني بقدميه كل يوم , يمكنه ذلك من خفض فرصة فقدان إصبع القدم , القدم , أو الساق.

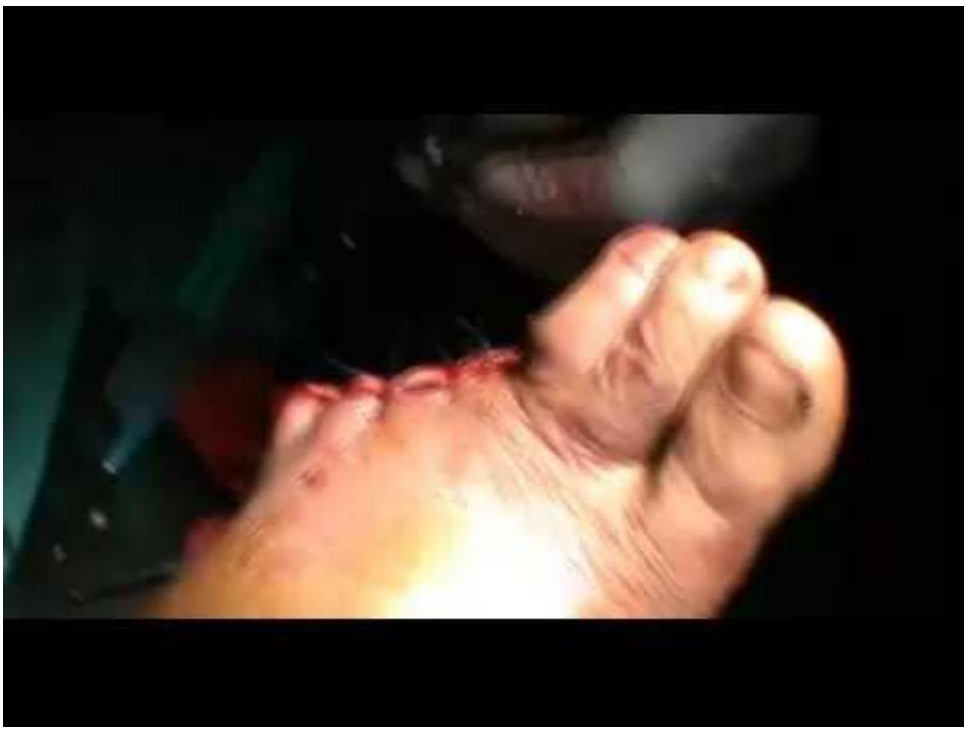
يسبب ارتفاع سكر الدم وعدم السيطرة على مرض السكري لفترات طويلة يحدث تلف في الأعصاب الموجودة في القدمين وضعف في تدفق الدم، مما يسبب خدر وتنميل في القدمين، وعدم شعور المريض في حال إصابته بجرح أو إصابة في القدم، وبالتالي زيادة خطر إصابة قدم مريض السكري بالعدوى، والالتهابات، والتقرحات، ومضاعفات شديدة قد تؤدي إلى بتر القدم السكرية في حال عدم علاجها بشكل مبكر.

تقرحات القدم:

تحدث غالبًا في مقدمة الجهة السفلية من القدم أو باطن إبهام القدم، وتظهر التقرحات على جانبي القدم غالبًا بسبب الحذاء غير المناسب.

الغرغرينا:

هو حالة تحدث عند موت الأنسجة بسبب عدم وصول الدم بشكل كامل إلى الخلايا أو الإصابة بعدوى شديدة.



الفحص الذاتي للقدم، وذلك عن طريق:

- البحث عن آثار للجروح والكدمات ومناطق الضغط والاحمرار ومشاكل الأظافر، ويمكن استخدام المرآة عند الفحص.
- تحسس كل قدم ومدى تورمها (الانتفاخ).
- فحص ما بين الأصابع.
- التحقق من الإحساس في كل قدم.
- التركيز على المناطق الستة التالية في باطن كل قدم: طرف الإبهام، وباطن الإصبع الصغير (الخنصر)، وباطن الإصبع الأوسط، والكعب، وحدود الجزء الأمامي من القدم.
- تجنب محاولة علاج أي شيء بدون استشارة الطبيب.

كيفية العناية بالقدمين

- غسلها يوميًا بالماء الدافئ والصابون، والتحقق من درجة حرارة الماء قبل استخدمه.
- تجنب نقع القدمين في الماء.
- ينصح بتجفيفها عن طريق الطبطبة بالمنشفة والتركيز على التجفيف بين الأصابع.
- ترطيبها بالكريمات المرطبة وتجنب وضع الكريم بين الأصابع.
- تقليم الأظافر بشكل مستقيم وتجنب قص زوايا الظفر لتفادي الجروح.
- إبلاغ الطبيب فورًا عن أي مشكلة تحدث للأظافر.
- تجنب استخدام المعقمات والمراهم والكمادات الساخنة والأدوات الحادة للقدمين
- المحافظة على تدفئتها عن طريق ارتداء الجوارب، وتجنب تعريضها لأي مصدر حرارة (مثل: الدفايات).
- ارتداء الجوارب المناسبة والمريحة ولا يجب أن تكون ضيقة أو مصنوعة من النايلون
- استعمال جوارب صوفية أو قطنية خاصة
- تغيير الجوارب يوميا مع التأكد من خلوها من أي بقع دم
- ارتداء جوارب نظيفة وجافة وتغييرها كل يوم، وتجنب ارتداء الجوارب المثقوبة.
- عدم تعريض القدمين بشكل مباشر للثلج والمطر
- تجنب وضع قدم فوق الأخرى لفترة طويلة؛ لأنه يمنع من تدفق الدم إلى القدمين.
- تجنب التدخين.
- تجنب المشي حافي القدمين.
- التأكد من أن الحذاء مريح قبل شرائه والتحقق من مقاسه جيدًا.

- تجنب الأحذية ذات الطرف المدبب وكذلك ذات الكعب العالي، واختيار الحذاء ذي الطرف الواسع.
- تجنب تكرار ارتداء لبس الحذاء الواحد كل يوم.
- تحسس الحذاء من الداخل باليد قبل ارتدائه.
- شد رباط الحذاء باعتدال.

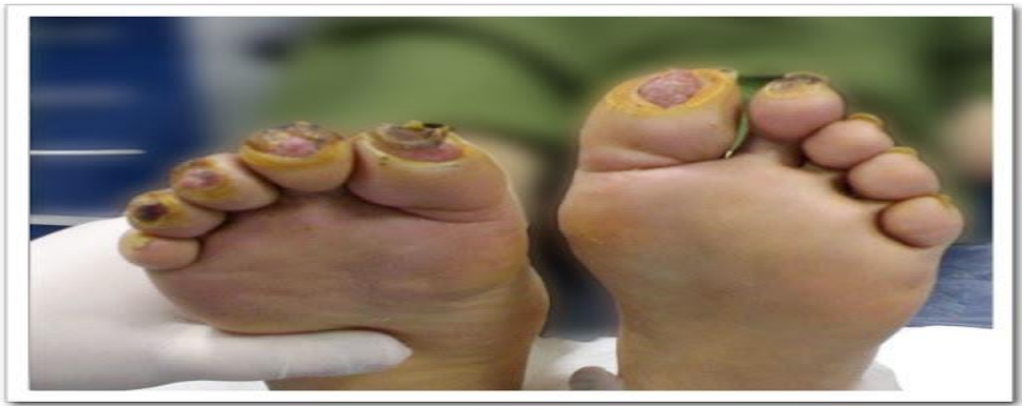
نصائح العناية بالقدم إذا كان لديك مرض السكري

- اغسل القدمين بالماء والصابون(غير ساخن)
- اثناء الغسيل نقم بإجراء فحص شامل للقدم
- شطف بالماء الدافئ ونتجنب الماء الساخن
- نجفف القدمين بعناية, خاصة بين الاصابع.
- نضع لوشن مرطب خالي من العطور والكحول مباشرة بعد تنظيف القدمين . لكن لا نضع لوشن بين الاصابع
- ارتدي أحذية تناسب قدمك جيدا بدون التسبب في ضغط أو فرك الاصابع. يمكن للأحذية الغير مناسبة أن تسبب مسامير القدم وتلف الجلد والقرحة ومشاكل الأظافر.
- لا تمشي حافي القدمين أبدا، خصوصا في الحديقة أو الاماكن خارج البيت وحاول تجنب الجلوس مع الساقين أحدهما فوق الأخرى.
- حافظ على أظافر قصيرة ومستقيمة.
- قم بمعالجة مسامير القدم أو الجلد الصلب عن طريق أخصائي القدم.
- ابحث عن العلاج من خلال طبيبك أو أخصائي القدم في حال عدم التئام بثور القدم أو الإصابات بسرعة.
- عالج القرحة بشكل عاجل، خلال ٢٤ ساعة، وخاصة إذا كان هناك احمرار أو تورم في جميع أنحاء المنطقة.

العناية بالاظافر

- تحتاج اظافر القدم الى عناية بشكل منتظم لان الاظافر الطويلة او السميكة يمكن ان تضغط على اصابع القدم المجاورة وتسبب تقرحات مفتوحة

- نصائح تقليم الاظافر



- تقليم الاظافر بشكل مستقيم
- لا تقطع في زوايا ظفر القدم. يمكن يسبب ذلك ظهور ظفر نامي تحت الجلد
- لا تستخدم السكاكين او المقصات او شفرات بالحلاقة لقص اظافر القدم

ارشادات حول بعض العادات الخاطئة عن ادوية السكر

١. إذا كانت جرعة الدواء زائدة، كأن يزيد المريض جرعة الأنسولين خطأ بدون استشارة الطبيب
٢. التقارب في مواعيد حقن الأنسولين وعدم الالتزام بالتوقيت الزمني لكل جرعة بشكل دقيق
٣. حقن جرعات إضافية من الأنسولين دون حساب مسبق، كأن يحقن المريض نفسه بجرعات إضافية من الأنسولين السريع من أجل تناول كميات مختلفة من الأطعمة والحلويات في الأعراس والولائم مثال.
٤. أحيانا بسبب تناول بعض الأدوية التي لها تأثير مفعل لأدوية السكري
٥. اخذ الحبوب الخافضة للسكر التي نسي المريض اخذها بالوقت المحدد (جرعة الصباح مع حبوب المساء)

ابتعد عن ذلك / عادات سيئة

١ .تأخير موعد تناول الوجبة الغذائية المقررة وفق زمن تأثير الدواء الخافض لسكر الدم أو الأنسولين

٢ .عدم تناول الفطور بعد حقن الأنسولين الصباحي بسبب التمسك بالعادات الخاطئة

٣ .عدم الالتزام بتناول الوجبات الخفيفة التي أشار بها الطبيب في الوقت المحدد

٤ .الامتناع عن تناول إحدى الوجبات الأساسية أو تأجيلها بعيدا عن موعدها المناسب

٥ .تناول وجبات فقيرة بالنشويات كأن يكتفي المصاب بالسكري بتناول اللحم والسلطة دون الخبز مثال.

٦ .عدم الانتظام في مواعيد تناول الوجبات الغذائية وتباعد الفترات بين وجبة وأخرى

٧ .عدم تناول وجبة غذائية وقت ذروة الأنسولين الذي حقنه المريض

٨ .عدم تناول الغذاء قبل ممارسة الأشغال المرهقة مثل حرث الأرض أوجمع الثمار أو تنظيف السجاد

❖ **العلاج بالأنسولين**

الأنسولين (Insulin) هو هُرمون ينتجه البنكرياس، ويوجد حيويًا في عدد من عمليات الأيض (Metabolism)والتي أكثرها شهرة عملية التحكم في مستويات السكر في الدم.

❖ **عدد الجرعات:**

تختلف الجرعات باختلاف نوع دواء الأنسولين المستخدم وباختلاف حاجة المريض الفردية والتي يحددها الطبيب المختص، ولكن تتراوح الجرعة بشكل عام بين مرة واحدة إلى أربع مرات يوميًا، وقبل تناول الطعام بـ ٣٠ إلى ٤٥ دقيقة وكذلك قبل النوم.

❖ **الجرعة:**

تتحدد الجرعة ونوع دواء الأنسولين المستخدم بحسب احتياجات المريض من قبل الطبيب الاختصاص.

❖ **بداية الفعالية:**

- فاعلية قصيرة الأمد: ١٥ ـ ٦٠ دقيقة.
- فاعلية متوسطة الأمد أو متواصلة: ١ ـ ٤ ساعات.

❖ **مدة الفعالية**

- فعالية قصيرة المدى: ٦ ـ ٨ ساعات.
- فعالية متواصلة: ١٢ ـ ٢٤ ساعة.

❖ **كيفية حقن الجسم بالأنسولين**

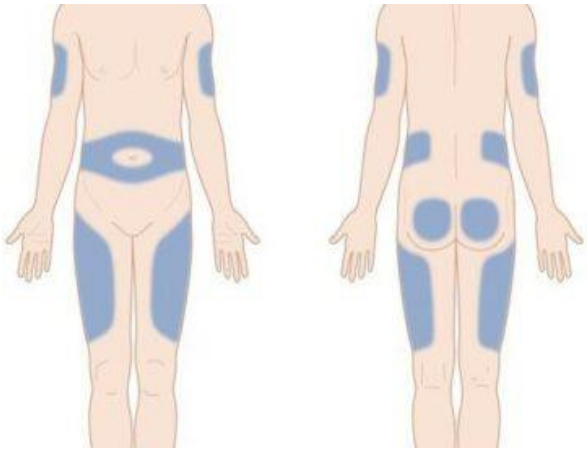
١- نظف اليدين جيداً، و امسح منطقة الحقن بالكحول.

٢- بعد جفاف الكحول ، امسك الجلد بين أصابعك، وادخل الإبرة كلها في الجلد، مع الضغط عليها.

٣- اترك الجلد من أصابعك واسحب الإبرة.

٤- اضغط على مكان الحقنة لمدة نصف دقيقة

❖ **أماكن حقن الأنسولين في الجسم**



. ١-في البطن وحول السرة بـ ٣سم

٢- الذراع ويفضل الجزء الأعلى الخلفي للذراع.

٣-الفخذ في الجزء الأمامي. المؤخّرة في الجزء الأعلى منها.

❖ **نصائح لحقن الأنسولين في الجسم**

- تجنّب الحقن بنفس المنطقة لتجنّب تليّفها.
- التأكّد من نظافة الجلد قبل الحقن.
- تجنّب الحقن في منطقة متورمة أو منتفخة.
- استبدال إبرة الحقن في كلّ مرّة.
- تفريغ الحقنة من الهواء. تفريغ جرعة الأنسولين ببطء.
- تجنّب الحقن في أماكن التعرق.
- قياس الأنسولين باستمرار قبل وبعد الوجبات.
- التأكد من عدم وجود أي ترسبات أو تكتلات في حقنة الأنسولين.
- رج علبة الأنسولين قبل استخدامها.

❖ **طريقة تخزين حقن الأنسولين.**

١- يجب حفظ عبوات الأنسولين في الثلاجة.

٢- في فصل الشتاء تحفظ الحقن في درجة حرارة الغرفة خارج الثلاجة

٣- من الأفضل سحب الأنسولين السريع (الصافي) في الحقنة قبل البطيء (العكر)، وذلك للحفاظ على صفاء الأنسولين السريع.

٤- عدم حفظ الحقن بالفريزر.

٥- عدم وضعها على التلفاز أو في السيارة لتجنب تلفه الأنسولين أو تغير في تركيبته.

٦- يجب الانتباه لتاريخ صلاحيّة الأنسولين، وتدوين التاريخ عند فتح العبوة، فهي لها تاريخان للصلاحيّة، إحداهما مسجّل على العبوة من المصنع، والثاني بعد مرور الفترة المسموح استخدامه بها بعد فتحه.

Appendix E

قائمة الخبراء

ت	اسم الخبير	اللقب العلمي	مكان العمل	الاختصاص الدقيق	سنوات الخبرة
١.	د. امين عجيل الياسري	استاذ	جامعة بابل / كلية التمريض	تمريض صحة مجتمع	٣٩ سنة
٢.	د. وداد كامل محمد	استاذ	جامعة بغداد / كلية التمريض	تمريض بالغين	٣٥سنة
٣.	د. هدى باقر حسن	استاذ	جامعة بغداد / كلية التمريض	تمريض بالغين	٣٤ سنة
٤.	د. سحر أدهم علي	استاذ	جامعة بابل / كلية التمريض	تمريض بالغين	٢٧ سنة
٥.	د.شذى محمد سعدي	استاذ	جامعة بابل / كلية التمريض	تمريض بالغين	٢٧ سنة
٦.	د. رجاء ابراهيم عبد	استاذ	جامعة بغداد / كلية التمريض	تمريض بالغين	٢٤ سنة
٧.	د. فاطمة مكي محمود	أستاذ مساعد	جامعة كربلاء /كلية التمريض	تمريض البالغين	٢٤ سنة
٨.	د. ضياء كريم عبد علي	استاذ مساعد	جامعة الكوفة / كلية التمريض	تمريض بالغين	١٨سنة
٩.	د. صادق عبد الحسين	استاذ مساعد	جامعة بغداد / كلية التمريض	تمريض بالغين	١٢ سنة
١٠.	د. علاء عبد العباس	طبيب استشاري	مستشفى الديوانية التعليمي /مركز السكري والغدد الصماء	اختصاص الامراض الباطنية	٣٠ سنة
١١.	د.علي الحلي	طبيب استشاري	مستشفى الديوانية التعليمي /مركز السكري والغدد الصماء	اختصاص الامراض الباطنية	٢٥ سنة
١٢.	د. عباس حمزة نجم	طبيب استشاري	مستشفى الديوانية التعليمي /مركز السكري والغدد الصماء	اختصاص الامراض الباطنية	١٣ سنة

المستخلص

مرض السكري هو أكثر الاضطرابات الأيضية المزمنة شيوعًا التي تتميز بارتفاع السكر في الدم. قد يكون سبب ارتفاع السكر في الدم هو نقص الأنسولين النسبي بسبب انخفاض إفراز الأنسولين أو ضعف عمل الأنسولين أو كليهما. يتسبب ارتفاع السكر في الدم المزمن الناتج عن ذلك في حدوث نسبة السكر في الأنسجة التي تؤدي عادة إلى اضطرابات التمثيل الغذائي الحادة ، وتلف الأعضاء الذي لا رجعة فيه ، ومضاعفات خطيرة ذات عواقب صحية عكسية.

الرعاية الذاتية هي استراتيجية مهمة للتحكم في نسبة السكر في الدم وضغط الدم والكوليسترول. تعمل سلوكيات الرعاية الذاتية على تحسين نوعية الحياة والصحة ، بالإضافة إلى زيادة رضا المرضى وتقليل كلفة الرعاية الصحية ، والعناية بالأعراض ، والبقاء على قيد الحياة.

الأهداف: الهدف من هذه الدراسة هو تقييم تأثير البرنامج الارشادي للرعاية الذاتية على المعرفة والسلوك لمرضى السكري من النوع ٢.

المنهجية:

تم إجراء تصميم شبه تجريبي باستخدام نهج القبلي ومابعد الاختبار لمجموعتين من العينات (الدراسة والضابطة) في مستشفى الديوانية التعليمي من الفترة من ١٥ تموز ٢٠٢٢ إلى ١٧ ايار ٢٠٢٣.

تتكون الأداة المستخدمة في الدراسة من جانبين: الجانب الاول استخدام المتغيرات الديموغرافية مثل العمر والجنس ومستوى التعليم والحالة الاجتماعية والمتغيرات السريرية (التدخين ومدة المرض ونوع العلاج والتاريخ العائلي للإصابة بالسكري النوع الثاني ومؤشر كتلة الجسم). والجانب الثاني مقياس الرعاية الذاتية لمرض السكري: تم إنشاء مقياس الرعاية الذاتية لمرض السكري في عام ٢٠٠٥ من قبل الباحثين الأمريكيين فيشر ولي لتقييم الرعاية الذاتية للأشخاص الذين يعانون من مرض السكري. كان المقياس الأصلي كرونباخ ألفا (٠.٨٠). وكشفت نتائج الدراسة المصغرة بعد تطبيقها على ١٠ مرضى يعانون من مرض السكري النوع الثاني، كانت ثبات النسخة العراقية للمقياس (ر = ٠.٨٤).

النتائج:

كان غالبية مرضى السكري من النوع الثاني ٣٣ (٥٥٪) من الإناث بينما كان الذكور ٢٧ مريضا (٤٥٪) في مركز الغدد الصماء والسكري في مستشفى الديوانية التعليمي. تقريبا (٦١.٧٪) منهم تتراوح أعمارهم بين ٥٠-٦٠ سنة، (٧١.٦٥٪) كانوا متزوجين، بالإضافة إلى اغلب المشاركين في كلا المجموعتين مستواهم التعليمي لا يقرا ولا يكتب (٣٣.٣). ومعظم المشاركين دخلهم الشهري متوسط. أظهر مقياس الرعاية الذاتية لمرض السكري أن تحسين الرعاية الذاتية بين مرضى السكري بعد اعطاء البرنامج بشكل ملحوظ من ١.٧٩ ٠ ± ٠.٣٦٠ إلى ٣.١٧ ٠ ± ٠.٥٤٦ (قيمة بي : ٠.٠١).

الاستنتاجات:

وخلصت الدراسة إلى ان البرنامج الارشادي يحسن أنشطة الرعاية الذاتية لمرضى السكري والمعرفة والالتزام بالنظام الغذائي والنشاط البدني والأدوية بين المصابين بداء السكري من النوع ٢.

جمهورية العراق
وزارة التعليم العالي والبحث العلمي
جـــامعـــــــة بـــــابـل
كـــليـــــــــة التمـــــريض

فاعلية البرنامج الإرشادي للرعاية الذاتية للمرضى البالغين للسيطرة على مرض السكري من النوع الثاني في مستشفى الديوانية التعليمي

اطروحة مقـــــدمة الى

مجلس كليــة التمريض/ جامعة بابل كجزء من متطلبات نيل درجة الدكتوراه فلسفة في علوم التمريض

مـن قبـل

علاء حمزة حرمس

بأشـــــراف

الأستاذ الدكتور فخرية جبر محيبس

شوال ١٤٤٤ هـ

ايار ٢٠٢٣