Effectiveness of an Educational Oriented Program upon Type II Diabetic Patients' Knowledge and Self-Care Practices in Al-Hilla City

A Thesis Submitted to the

Council of the College of Nursing / University of Babylon.

By

Salim Karim Hajwal Al- Juboury

In Partial of Fulfillments of the Requirements for the Philosophy Doctorate of Nursing

Academic Supervised by

Professor.Dr. Salma k. Jehad , Ph.D.

May, 2022 AD   *Shawal, 1443 AH*

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

((وَيَسْأَلُونَكَ عَنِ الرُّوحِ قُلِ الرُّوحُ مِنْ أَمْرِ رَبِّي وَمَا أُوتِيتُمْ مِنَ الْعِلْمِ إِلا قَلِيلا))

صدق الله العلي العظيم
سورة الاسراء الآية 85

Dedication

I would like to dedicate this work and effort to the soul of my parents, who instilled in me the virtues of perseverance and commitment, a plant full encouraged me to strive for excellence,

My brothers and sisters for their warm encouragement,

My wife for her support and encouragement,

My teachers, friends and colleagues. With

Respect

Salim

Academic Supervisor Certification

I certify that the Dissertation entitled **Effectiveness of an Educational Oriented Program upon Type II Diabetic Patients' Knowledge and Self-Care Practices in Al-Hilla City** was prepared under my supervision at the College of Nursing, the University of Babylon in partial fulfillment of the requirements for the degree of Philosophy Doctorate in Nursing.

Signature

Professor. Salma k. Jehad, PhD

Professor Ph.D. and Academic Advisor

College of Nursing

University of Babylon

Data: / 5 /2022

Signature

Professor. Salma k. Jehad, PhD

Head of Family and Community Health Nursing Department

College of Nursing

University of Babylon

Data :   / 5 / 2022

Certification

We, members of the examining Committee, certify that the dissertation entitled **"**Effectiveness of an Educational Oriented Program upon Type II Diabetic Patients' Knowledge and Self-Care Practices in Al-Hilla City**"** submitted by **Salim Karim Hajwal Al-Juboury**, from the Department of Community Health Nursing, and we have examined the student in its content, and what is related to it and we decide that it is adequate for awarding the Doctorate of **(Ph.D.)** in **(Philosophy of Nursing, Community Health Nursing)** with an estimate of (   ). On 30 / 5 / 2022.

Signature
Professor
Name: **Dr. Muna A. Khaleel**
Member
Date: 30 / 5 / 2022

Signature
Professor
Name**: Dr. Fatima W. Khudair**
Member
Date: 30 / 5 / 2022

Signature
Professor
Name: **Dr. Fakhria Jaber Muhaibes**
Member
Date: 30 / 5 / 2022

Signature
Professor
Name: **Dr. Kafi Mohammad Nasir**
Member
Date: 30 / 5 / 2022

Signature
Professor
Name: **Dr. Amean A. Yasir**
Chairperson
Date: 30 / 5 / 2022

Approved by the Council of the College of Nursing, Family and Community Health Nursing Department

Professor
Dr. Amean A. Yasir
Dean, College of Nursing, University of Babylon
Date: 30 / 5 / 2022

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summary

Diabetes mellitus especially type II has recently become a serious disease with the high possibility of an increased rate of comorbidity since it is a long-life disease that requires a person with adequate knowledge regarding the disease itself as well as good self–care.

This study aims to evaluate the effectiveness of an educational program on the knowledge and self-care of patients with type II diabetes mellitus. The study was conducted From November 27th, 2020 to March 1th 2022. A quasi-experimental design was used to conduct the study. The investigator developed the program and instruments to accomplish the study's objectives. A sum of 50 patients was purposely selected and divided into groups. The Study Groups (25) patients who were exposed to the education program as Study Groups, and the Control Groups (25) who were not.

The effectiveness of this program is measured by the use of a knowledge pre and post-test that includes (20) items and self-care (30) items. The validity of the instrument was assured through a board of experts, and the instrument's reliability was established through conducting a pilot study. The data were analyzed by using descriptive and inferential statistics for the 20 Knowledge items (pre) 0.82. (post) 0.86. Self-care 30 items (Before) 0.76. (After) 0.81.that considered an acceptable result for the instrument stability.

The study findings indicated that the Study Groups showed poor knowledge at Mean± SD= 1.23±0.200, and poor self-care at Mean± SD= 1.24±2.75, while the Study Groups at post-test showed a good knowledge at Mean± SD=2.71±0.277, and good self-care knowledge at Mean± SD=2.75±0.440 as Well as the study found highly significant differences between the two periods of measurement for both groups at *p < 0.01*.

Conversely, the Control Groups had poor knowledge and poor self-care at a pre-post test score, and there was never signed in differing between the pre-test and post-test for both groups at *p > 0.05*.

The results of the study concluded that patients had low knowledge and self-care practices and require specialized teaching programs and training sessions.

Finally, the study recommended that the Ministry of Health (MOH) can assign more qualified nurses to provide care to the patients, start the teaching strategies in the period of the disease diagnosis and all the organizations are invited to increase the public awareness regarding the disease and its complications.

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List of Abbreviations

Items	Full name
%	Percentage
∑	Summation of.
AD	Anno Domini
ADA	American Diabetes Association
BC	Before Christ
CP	cumulative percentage
DF	degree of freedom
DKA	Diabetic ketoacidosis
DKQ	Diabetes Knowledge Questionnaire
DKT	Diabetes Knowledge Test
DM	Diabetes mellitus
DSCK	Diabetes Self-care Knowledge
DSMES	. Diabetes self-management education and support
DSMS	Diabetes Self-Management Support
EASD	European Association for the Study of Diabetes
et al.	Italia and others (other)
F	Frequency
FDA	Food and Drug Administration
FDA	Food and Drug Administration
GDM	. Gestational Diabetes mellitus
GLP1	glucagon-like peptide-1
HbA1c	(glycated Hemoglobin, average blood glucose control over 2-3 months) the test is a common blood test used to diagnose type I and type II diabetes
HLA	human leukocyte antigen
HS	Highly significant
I.D.F	International Diabetes Federation
IDF	International Diabetes Federation
IR	Insulin resistance
MS	Mean of Score
N	A number of cases.
NIDDM	non-insulin-dependent diabetes mellitus
NS	non-significant
P. Value	probability value
S	Significant

SD	Standard Deviation
SGLT2i	sodium-glucose co-transporter-2 inhibitor
SMBG	Self-monitoring of blood glucose
SPSS	Statistical Packages for Social Sciences
UCTH	University of Calabar Teaching Hospital
USD	United states Dollar
Vol.	Volume
WHO	World Health Organization
x^2	Chi-Square
A	Alpha Cornbrash's
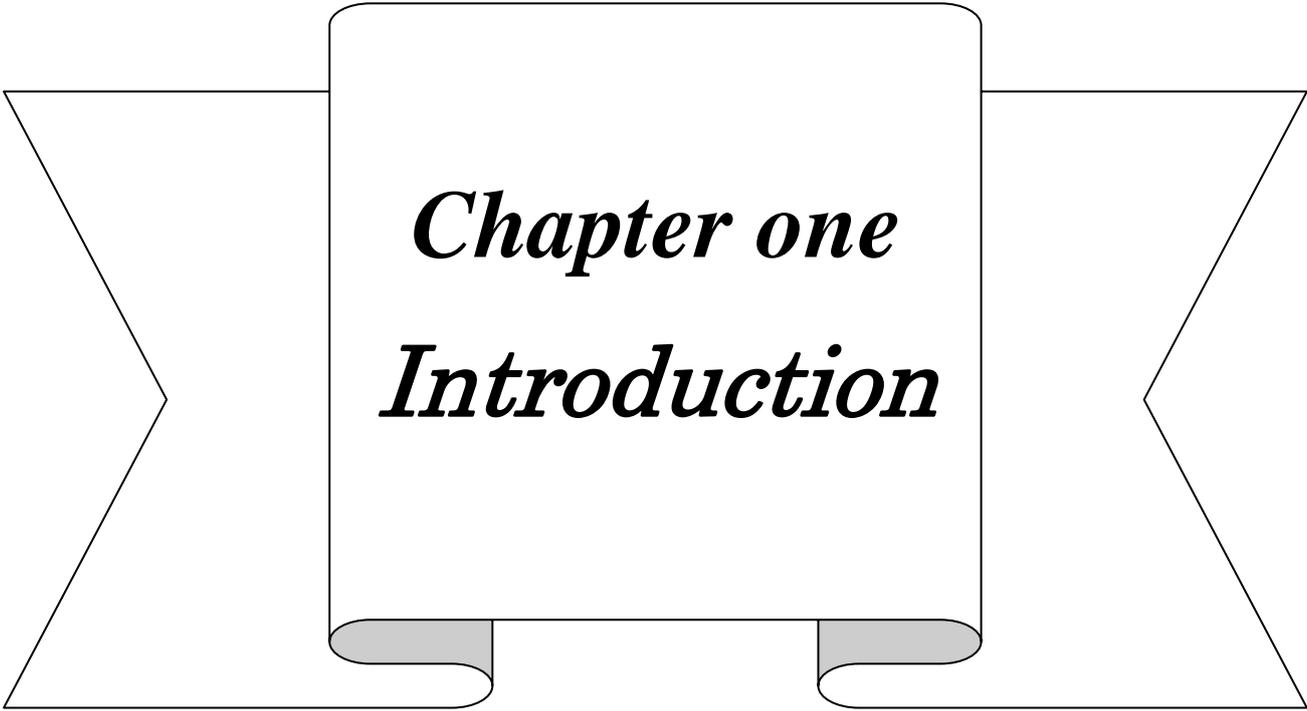
Chapter one
Introduction

Chapter One

Introduction

1.1. Introduction

Diabetes mellitus is a serious, long-term condition with a major effect on the lives and well-being of individuals, families, and cultures worldwide. It is among the top 10 causes of death in adults and is estimated to have caused four million deaths globally in 2017. In 2017, global health expenditure on diabetes was estimated to be USD 727 billion (American Diabetes Association, 2017).

Diabetes mellitus is considered one of the most common non-communicable diseases affecting people around the world. The International Diabetes Federation (IDF) estimated that 451 million people worldwide had diabetes in 2017 and the number is expected to rise to 693 million by 2045. Unfortunately, most people with diabetes live in low- and middle-income countries. Uncontrolled diabetes can lead to macrovascular and microvascular complications, including stroke, heart disease, blindness, renal failure, and lower limb amputation. In 2017 an estimated 5.0 million deaths worldwide were directly caused by diabetes (Marathe *et al*, 2017).

This disorder is a complex metabolic disorder characterized by persistent hyperglycemia resulting from a defect in insulin secretion, insulin action, or both. Type I diabetes is defined by insulin insufficiency and requires daily insulin treatment. Type II diabetes is characterized by insulin deficiency and requires daily insulin administration. Type 2 diabetes is caused by the body's poor utilization of insulin, whereas gestational diabetes is hyperglycemia that develops or is first noticed during gestation. Insulin treatment is an effective aspect of diabetes treatment and is a

cornerstone of type I diabetes treatment. It is also vital to the management of type 2 diabetes in many circumstances. Despite this, at least one-third of patients do not take their insulin as directed, and 20 percent of adults purposefully skip doses (American Diabetes Association. Diabetes care, 2014).

Treatment strategies for type II diabetes are to prevent or delay complications and maintain quality of life. This requires control of glycemia and cardiovascular risk factor management, regular follow-up, and, importantly, a patient-centered approach to enhance patient engagement in self-care activities (Davies *et al.*, 2018).

The ascending trend in the number of diabetic patients increases the need to improve both the treatment and care. The fact that the disease treatment and its associated factors are very complex again further increases the need for patient education and medical supervision (Association Diabetes Association, Glycemic targets. 2018).

One of the primary causes of diabetes is poor dietary habits. Failure to adhere to a tight food plan and physical activity, as well as recommended medicine, is one of the leading causes of problems in T2DM patients (Gaede *et al.*, 2008).

Diabetes mellitus (DM) is on the rise at an alarming rate over the world. As per the International Diabetes Federation, an estimated 415 million people worldwide had diabetes in 2015. (Papatheodorou *et al.*, 2016)

Diabetic problems include epidemiology and pathophysiology, microvascular issues, macrovascular difficulties, other complications, and possible treatments there is mounting evidence that specific genetic and

epigenetic alterations, dietary variables, and a sedentary lifestyle are all involved in the etiology of diabetes problems (Papatheodorou *et al*., 2016).

Diabetes self-management education (DSME) is a cornerstone for optimal diabetes care, according to the American Diabetes Association (ADA). The importance of DSME is due to the complexity of controlling type-2 Diabetes. Patients are assigned a variety of responsibilities, including attending medical visits regularly, adhering to verified prescription regimens, and engaging in self-care behaviors such as at-home blood glucose monitoring, healthy food adjustments, and increased physical exercise (American Diabetes Association, 2014)

People, on the other hand, find it challenging to consistently participate in the many beneficial habits required for excellent glycemic control. Competing for everyday demands, irritation, various forms of mental pain, and a lack of self-commitment are all common difficulties (Tong *et al*., 2015)

In addition, poor diabetes self-management has been linked to a lack of information, a low level of self-efficacy to complete activities successfully, and inadequate social support from family members (Miller and Dimatteo, 2013).

Optimal diabetes management requires an organized, systematic approach and the involvement of a coordinated team of dedicated health care professionals working in an environment where patient-centered high-quality care is a priority (American Diabetes Association, 2017).

Diabetes care also requires a systematic approach to support patients' behavior change efforts. High-quality diabetes self-management education and support (DSMES) have been shown to improve patient self-

management, satisfaction, and glucose outcomes. National DSMES standards call for an integrated approach that includes clinical content and skills, behavioral strategies (goal setting, problem-solving), and engagement with psychosocial concerns (Beck *et al.*, 2017).

Diabetes is a complicated etiology that includes both irreversible and reversible risk variables such as age, genetics, race, and ethnicity, as well as reversible risk factors such as nutrition, physical activity, and smoking. Diabetes may be managed by changing a patient's knowledge, attitude, and behavior. These elements are seen to be an important aspect of comprehensive diabetes management (Islam *et al*., 2015).

People with diabetes require reinforcement of diabetes education, including food management, from healthcare practitioners to help them to better understand treatment strategies and improve their quality of life (Sami *et al*., 217).

Diabetic patient education, with consequent improvement in knowledge, leads to better control of the disease and is widely accepted to be an integral part of comprehensive type II diabetes care (Mohan *et al.*, 2005).

When patients can produce effective self-care, it shows that they have awareness of themselves and their disease conditions. The individual's internal and external circumstances are covered by self-care and applicable information or awareness. The age, marital status, degree of education, and socioeconomic situation of an individual influence the maintenance and growth of a self-care agency. The primary lifestyle adjustments in public health promotion include a nutritious diet, frequent exercise, and keeping a healthy body weight (National Center for Health Statistics, 2009).

There is evidence that type II diabetes in children and adolescents is increasing in some countries. However, reliable data are sparse. As with type I diabetes, many children and adolescents with type II diabetes risk developing complications in early adulthood, which places a significant impact on the individual, the family, and society. With increasing levels of obesity and physical inactivity among children and adolescents in many countries, type II diabetes in childhood and adolescence has the potential to become a global public health issue leading to serious adverse health outcomes (Nolan *et al*. 2011).

The DSME and DSMS programs help people with diabetes gain the information, skills, and abilities they need to take care of themselves, while also taking into account their needs, aspirations, and life experiences. When providing DSME or DSMS, providers need to know the burden of treatment, the patient's level of confidence/self-efficacy for management behaviors, as well as the level of social and family support. The overall objectives of DSME and DSMS are to support informed decision making, self-care behaviors, problem-solving, and active collaboration with the health care team to improve clinical outcomes, health status, and quality of life in a cost-effective manner, and evaluate the patient's self-management performances as well as the psychosocial elements that influence the person self-management (Powers *et al*., 2017).

Type II diabetes mellitus can often be managed solely through lifestyle modifications such as following a healthy diet and being physically active, Diet and exercise can both independently facilitate favorable body composition results and increase insulin sensitivity, thereby improving glucose uptake by the muscle and the liver and thus regulate blood glucose concentrations (Evert *et al.,* 2019)

Diabetes mellitus is a major and growing medical problem, affecting patients of all ages worldwide. Diabetes education aims to change the patient's behavior, increase their motivation to follow therapeutic guidelines, improve their quality of life, establish a partnership within the treatment process, prepare the patient for self-care, increase their knowledge of cardiovascular risk, and increase their psychological resilience, among other things. The educational process is influenced by a variety of elements, including the patient's psychological and socioeconomic status, as well as educator-related aspects. The benefits of DM education are mostly shown in terms of patient self-care and diabetes metabolic management (Al-Khawaldeh *et al*., 2012).

People with diabetes are mostly responsible for managing their chronic illness on a day-to-day basis. The goal of care, which includes blood glucose monitoring, medication administration, nutrition, and physical exercise, is to bring blood glucose levels back to normal. Glycemia levels in many people, however, routinely surpass the recommended levels. This observation, together with accounts from patients and practitioners, implies that active self-management is ineffective. The lack of compliance with the treatment regimen is due to a variety of factors, both personal and environmental (Ahola and Groop, 2013).

1.2. Importance of the study

Over the next 20 years, the International Diabetes Federation predicts that the number of people with diabetes in the Middle East and North Africa (MENA) region will almost double. This article seeks to evaluate the changing epidemiology of diabetes in Iraq. Methods: In this study, we conducted a review of literature dealing with the epidemiology of diabetes in Iraq. The search

limits were set to English-language publications between 1970 and 2013. Results: The prevalence of diabetes in Iraq increased from 5% in 1978 to 19.7% in 2012, with a prevalence of dysglycemia of 48.8%. Conclusion: Iraq facing an epidemic of diabetes mellitus like that of the Middle East. Diabetes drugs and insulin should be available to face this situation, healthcare systems need to cope with this epidemic. More and larger studies are needed to assess the epidemiology of the disease (Mansour & Al Douri, 2015).

The increase of cases among adults and incrusted in mortality and morbidity led the researcher to select this topic. In 2015, approximately 5.0 million people were estimated to have died from diabetes. Poor glycemic control is the most determinant of diabetes-related complications and death. The percentage of patients whose blood glucose level is not well controlled remains high. Many studies are conducted to identify the determinants of poor glycemic control at diabetes clinics (Mamo *et al.,* 2019).

Diabetes self-management support (DSMS), dietary treatment, physical exercise, smoking cessation counseling, and psychosocial care are all examples of lifestyle management. To improve diabetes treatment, patients and care providers must work collaboratively from the time of the initial complete medical examination, through all future assessments and follow-ups, and throughout the assessment of complications and treatment of associated illnesses (American Diabetes Association. 2017).

According to national standards for diabetes self-management education and support, all patients with diabetes must participate in diabetic self-management education to facilitate the "skills, knowledge, and ability

necessary for diabetes self-care, as well as diabetes self-management, support to assist with initiating and sustaining skill and behavior needed for ongoing self-management, both at diagnosis and as required thereafter". Diabetes self-management education and support must be patient-centered, respectful of unique patient choices, needs, and values, and should inform clinician decisions. Diabetes self-management educations and assistance programs include the required components in their curriculum to help people postpone or avoid the onset of T2DM. When diabetes prevention is the aim, diabetes self-management education and support programs should be able to customize their content, because diabetes self-management support and education can improve the result and save costs (American Diabetes Association, 2017).

Diabetes education is a crucial part of diabetes management. Diabetes education aims to change the patient's behavior, increase their motivation to follow the therapeutic recommendation, improve their quality of life, establish a partnership within the treatment process, prepare the patient for self-care, increase their awareness of cardiovascular risk factors, and increase their psychological resilience, among other things. a variety of elements influence the educational process, including the patient's psychological and socioeconomic status, as well as educator-related aspects. Diabetes self-management benefits are mostly shown in terms of patient self-care and diabetes metabolic management (Switoniowska *et al*, .2019).

Because education broadens patients' skills and knowledge, changes their behaviors, tends to increase their motivation to follow treatment guidelines, improves their quality of life, encourages them to participate in the treatment process, prepares them to practice self-care, raises their

knowledge of cardiovascular risk factor, and improves their psychological flexibility, it is an important part of the treatment process (Muchiri et al, 2016).

Despite the benefits of education in the management of diabetes multiple studies have shown that patients' knowledge and practice of prevention, treatment, and management of DM complications, and nutrition are poor or insufficient (Mohammadi *et al*., 2015).

Inadequate patient education, on the other hand, has been identified as the most crucial factor influencing their poor understanding and performance, with the majority of individuals having minimal formal DM education (Melinda *et al*., 2012).

A good needs assessment is the first stage in the design and production of instructional material. The results of the needs assessment were utilized to build a curriculum to help patients and experts improve their knowledge and skills (Evans *et al*., 2017).

whether healthcare practitioners have sufficient resources or abilities to support good eating for diabetic patients is not consistently recorded. Lack of advanced nutrition understanding of diabetes diet and communication skills with diabetes patients, such as psychological training, were hurdles to successful dietary teaching for healthcare workers. Psychological skill development is also a necessary component of diabetes education. In diabetic counseling, dietitians, who are educated to provide medical nutrition treatment, play an essential role. Nutrition education is occasionally offered by other types of delivery agents, including health care professionals, community health workers, or others, due to restricted availability to dietitians and possibly greater program costs compared to

other types of intervention delivery agents. A comprehensive review and meta-analysis of nutrition education for diabetes prevention indicated that dietitian-provided treatments resulted in more weight loss than those offered by other individuals. (Sun *et al.*, 2017)

Family members are a crucial source of social support for diabetes patients' self-care, and a lack of family support might be one of the most significant hurdles to patient self-care management. Patients' hurdles include lack of attendance at visits, unwillingness to commit to regular meetings, and patients not prioritizing diabetes self-management, according to the findings of a psychological intervention study and nurses' experiences of participation (Graves *et al.*, 2016).

The present study highlights the outcome of the planned educational program regarding Type II Diabetic Patients' Knowledge and Self-Care Practices in Al-Hilla City as well as monitoring the strengths and weaknesses of patient's knowledge of self-care and the extent of seriousness in finding appropriate solutions to resolve as much as possible of the problems experienced by these patients.

1.3. Statement of the Problem

Effectiveness of an Educational Oriented Program upon Type II Diabetic Patients' Knowledge and Self-Care Practices in Al-Hilla City.

1.4. Objectives of the study are to:

1- assess the type II diabetic patients' knowledge and self-care practices needs for this program

2- assess type II diabetic patients' knowledge and self-care practices for both (experimental and control groups).

3. apply to an educational program that is concerned with type II diabetes mellitus

4- determine the effectiveness of an educational program on type II diabetic patients' knowledge and self-care by the different practices.

5- find out the relationship between patient's knowledge and self-care practices for both groups and in all tests and their Socio-demographic characteristics

1. 5. Definition of terms

1.5.1. Effectiveness

a. Theoretical definition:

Affects task effort, persistently expressed interest, and the level of goal difficulty selected for performance. Despite this, little attention has been given to its organizational implications. (Bekele *et al*., 2020).

b. Operational definition:

is measured by the difference in scores pre and post-program

1.5.2. Educational Oriented Program

a. Theoretical Definition:

It is a collection of educational activities that are organized to accomplish a pre-determined objective or the completion of a specified set of educational tasks (Vermeersch& Vandenbroucke, .2014).

b. Operational definition:

the educational program that is concerned with type II diabetes mellitus

1.5.3. Knowledge

a. Theoretical definition:

Is a familiarity, awareness, or understanding of someone about something, such as facts propositional knowledge, skills, procedural knowledge, or objects acquaintance knowledge (Oeberst *et al*., 2014).

b. Operational definition:

A measured level of patient's response information regarding type II diabetes mellitus throughout pre and post-tests.

1.5.4. Self-Care

a. Theoretical Definition:

Self-Care practice is the ability of individuals, families, and communities to promote health, prevent diseases, maintain health, and cope with illness and disability with or without the support of a healthcare provider (WHO, 2009).

b. **Operational Definition:**

Self-care refers to the daily actions taken by the patient himself to recognize, treat, manage and control type II diabetes mellitus.
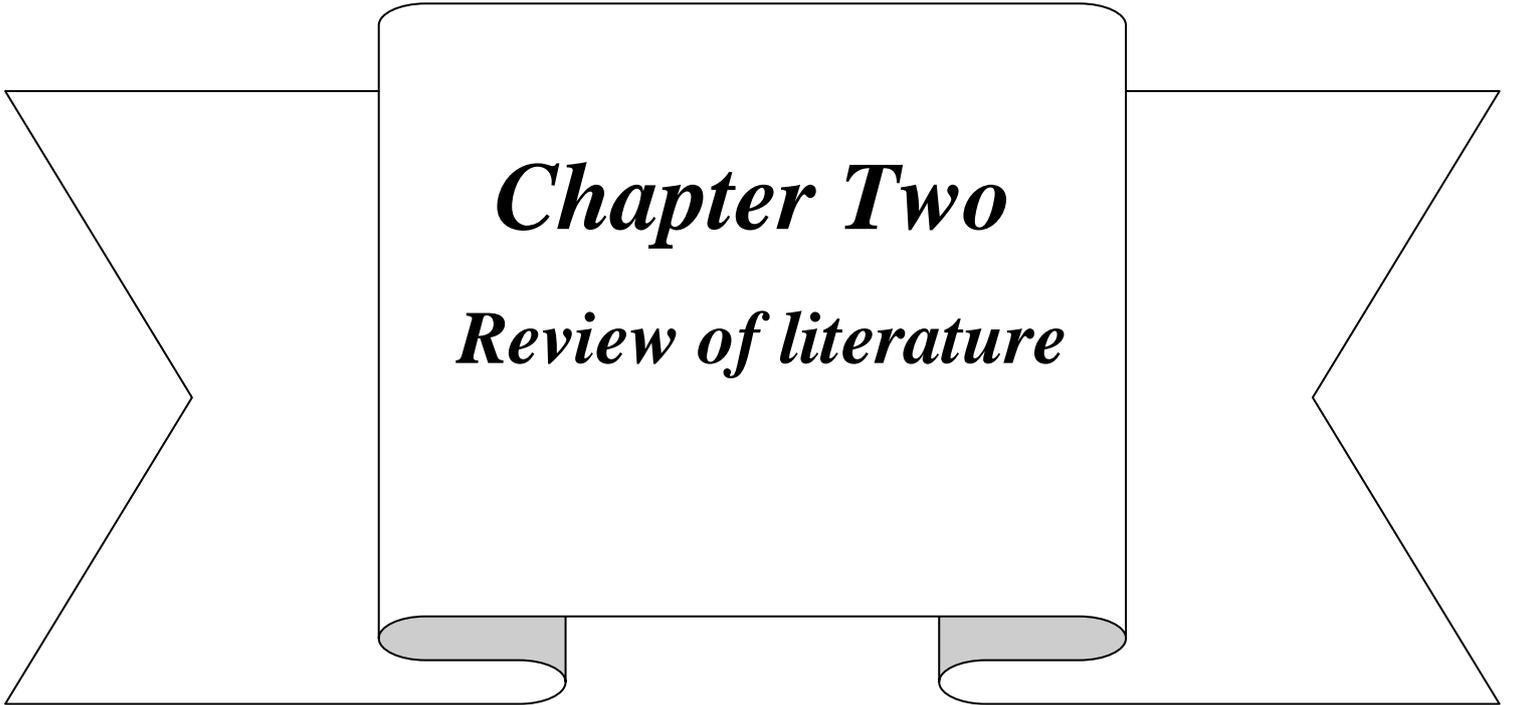
Chapter Two

Review of literature

Review of Literature:

This section contains a literature review, which is related to the Effectiveness of an Educational Oriented Program on Type II Diabetic Patients' Knowledge and Self-Care Practices in Al-Hilla City. (Dietary habits, physical activity, foot care, adherence to medical treatment, self-monitoring of blood glucose and Smoking), Clinical outcomes (glycemic control, glycated Hemoglobin, average blood glucose control over 2-3 months (HbA1c), and body weight)

2.1. Diabetes Mellitus in Historical Perspective: An Overview

Arctaeus of Cappadocia invented the name diabetes. It was taken from the Greek term Diabaincin, which was formed by combining the prefix dia-, which means across, with the verb being in, which means to walk or stand. The term diabeinin originally meant to stride, walk, or stand with legs strewn apart, hence diabetes implies one who straddles, or more particularly a compass, siphon. The sense siphon caused an illness in which an excessive volume of urine was discharged (Dobson, 2011).

Diabetic is first mentioned in English in medical literature written about 1425, with the first documented reference of diabetes symptoms occurring in 552 B.C. When Hey-Ra, an Egyptian physician, documented frequent urination as a symptom of a mysterious disease, and Artens, a Greek physician, described what is now known as diabetes as the meeting down of flesh and limbs into the urine in 150 Anno (AD), physicians began to gain a better understanding of diabetes (Page-Reeves et al., 2013).

Among the 20 types of illness flow of pee recorded in Hindu Medical Text Books from the fifth century was sweet, honey urine. After allowing urine to sit in the open air for a while, Avicenna remained.

Thomas (1621-1675), on the other hand, was the first to explain the saccharine quality of urine, characterizing the sweetness after evaporation as though impregnated with honey and sugar (Malowaneg, 2008).

Diabetes mellitus (DM) is a globally epidemic metabolic disorder with a global prevalence of 8.4%, with the highest levels (9.2%) reported in the Middle East region. This high prevalence is expected to continue rising in the future (Atlas, 2018).

Diabetes is a chronic disease that requires a person with diabetes to make a multitude of daily self-management decisions and perform complex care activities. Diabetes self-management education and support (DSME/S) provides the foundation to help people with diabetes to navigate these decisions and activities and has been shown to improve health outcomes (Brunisholz *et al.*, 2014)

Diabetes mellitus is a complex and difficult condition that necessitates daily self-management decisions by the diabetic. DSME addresses the holistic blend of clinical, psychosocial, educational, and behavioral aspects of care required for daily self-management and lays the groundwork for all people with diabetes to navigate their daily self-care with confidence and better results (American Diabetes Association, 2020).

Diabetes is a costly condition, with health-care expenditures alone costing 2-3 times more for a diabetic than for someone who does not have diabetes. (American Diabetes Association, 2018).

Type II diabetes begins with insulin resistance, a condition in which cells fail to respond to insulin properly. As the disease progresses, a lack of insulin may also develop. This form was previously referred to as "non-insulin-dependent diabetes mellitus (NIDDM) or adult-onset

diabetes". The most common cause is a combination of excessive body weight and insufficient exercise (WHO, 2013).

2.2. Diabetes Mellitus

2.2.1. Classification of DM

Diabetic can be categorized into the following classifications: Type I diabetes (caused by the death of beta cells by the immune system, resulting in complete insulin insufficiency), and Diabetes type 2 (caused by a gradual loss of sufficient-cell insulin production, often in the context of insulin resistance), DM during pregnancy is a condition that occurs when a woman is pregnant (diabetes diagnosed in the 2nd or 3rd trimester of pregnancy that was not overt diabetes before gestation) Monogenic diabetic syndromes,(such as newborn diabetes and young-onset DM), illnesses of the exocrine pancreas (such as cystic fibrosis and pancreatitis), and drug- or chemical-induced diabetes (such as with glucocorticoids, in the treatment of HIV/AIDS, or following organ donation) (American Diabetes Association, 2014).

T1DM and T2DM are both diverse illnesses with a wide range of clinical manifestations and disease progression. Although classification is critical for deciding treatment, some people cannot tell whether they have type I or type II diabetes at the diagnosis time. Traditional assumptions that T2DM primarily affects adults and T1DM only affects children are no longer valid, as both diseases affect people of all ages. Polyuria/polydipsia is the most common symptom of type I diabetes in children, and diabetic ketoacidosis affects around one-third of them (DKA) (Dabelea *et al*., 2014).

A single categorization system for diabetics would be ideal since it would make clinical treatment, audio-pathology, and epidemiology easier. Unfortunately, given our current understanding and the available resources in most nations throughout the world, this is not conceivable.

With this in mind, the Expert group decided that defining a categorization system that emphasizes clinical care and assists health providers in deciding whether or not to start insulin therapy, especially at the time of diagnosis, was the best option. The panel determined that a clinically-based categorization system must meet the following criteria: it must be universally relevant and use simple and easily available clinical data and resources; it must be accurate and equitable, and it must be feasible to execute. Only one classification system that might help with this right now uses clinical criteria to identify diabetic subtypes. Specific supplementary studies are available in some countries and clinical or research institutes to augment this method, but they are not generally available, and a categorization system based on these measures would have limited worldwide application (WHO, 2019).

Genotyping is useful in clinical settings for monogenic diabetes, but not for polygenic diabetes, such as Type 1 diabetes mellitus or Type 2 diabetes mellitus (genome-wide association studies have revealed over 100 related genetic markers) (Tuomi *et al*., 2014).

T2DM accounts for 90 percent to 95 percent of all diabetes cases, with the highest prevalence in low- and middle-income nations. It is a common and serious global health problem that has evolved in response to "rapid cultural, economic, and social changes, such as population aging, unplanned urbanization, dietary changes such as increased consumption of highly processed foods and sugar-sweetened beverages, obesity, reduced physical activity, unhealthy lifestyle and behavioral patterns, fetal malnutrition, and increased fetal exposure to hyperglycemia during pregnancy". T2DM is most frequent in adults, but it is increasingly affecting a growing number of children and adolescents (WHO, 2016).

T2DM is defined by the loss of beta cells in the pancreas, resulting in complete insulin insufficiency. It usually starts in childhood or adolescence, although it may start at any age T2DM is the most common type of diabetes (90 percent), and it is caused by insulin resistance combined with an insulin secretion abnormality. Obese and older children with a favorable family history are more likely to develop it. Types of diabetes that are not as common include genetic defects in insulin action, infections, such as congenital rubella, or drugs, such as corticosteroids, pancreatic exocrine insufficiencies, such as cystic fibrosis, or hyperglycemia caused by genetic defects in Beta-cell function, such as maturity-onset diabetes in children, or endocrine disease, and genetic chromo Sal syndromes, such as Down's syndrome (WHO, 2014).

2.3. Theoretical Framework

A theoretical framework supports a research study's work while also serving as a key component in displaying the researcher's knowledge of theory and ideas. It also makes it easier for the researcher to connect and support their study with proven theory from the existing literature that has been vetted, certified, and widely recognized by the others (Grant and Osanloo, 2014).

2.3.1. Orem's self-care theory

Dorothea Orem developed her self-care theory in the 1950s, and it is this theoretical framework that will be applied in this research project. She was a well-known nursing theorist in the twentieth century, and she received several prizes for her contributions and advancements in nursing theory and research. Her objective in developing a nursing theory and its unique knowledge framework was to promote the belief that nursing intervention in the promotion of self-care is only necessary when patients are unable to reach their ideal goal of living a healthy

lifestyle and feeling well. As a result, nurses will step in as an advocate, educators, and supporters in such situations (Snowden et al., 2014).

Orem's theory is made up of three parts: a theory of self-care, a theory of nursing systems, and a theory of self-care deficiency (Orem, 2001).
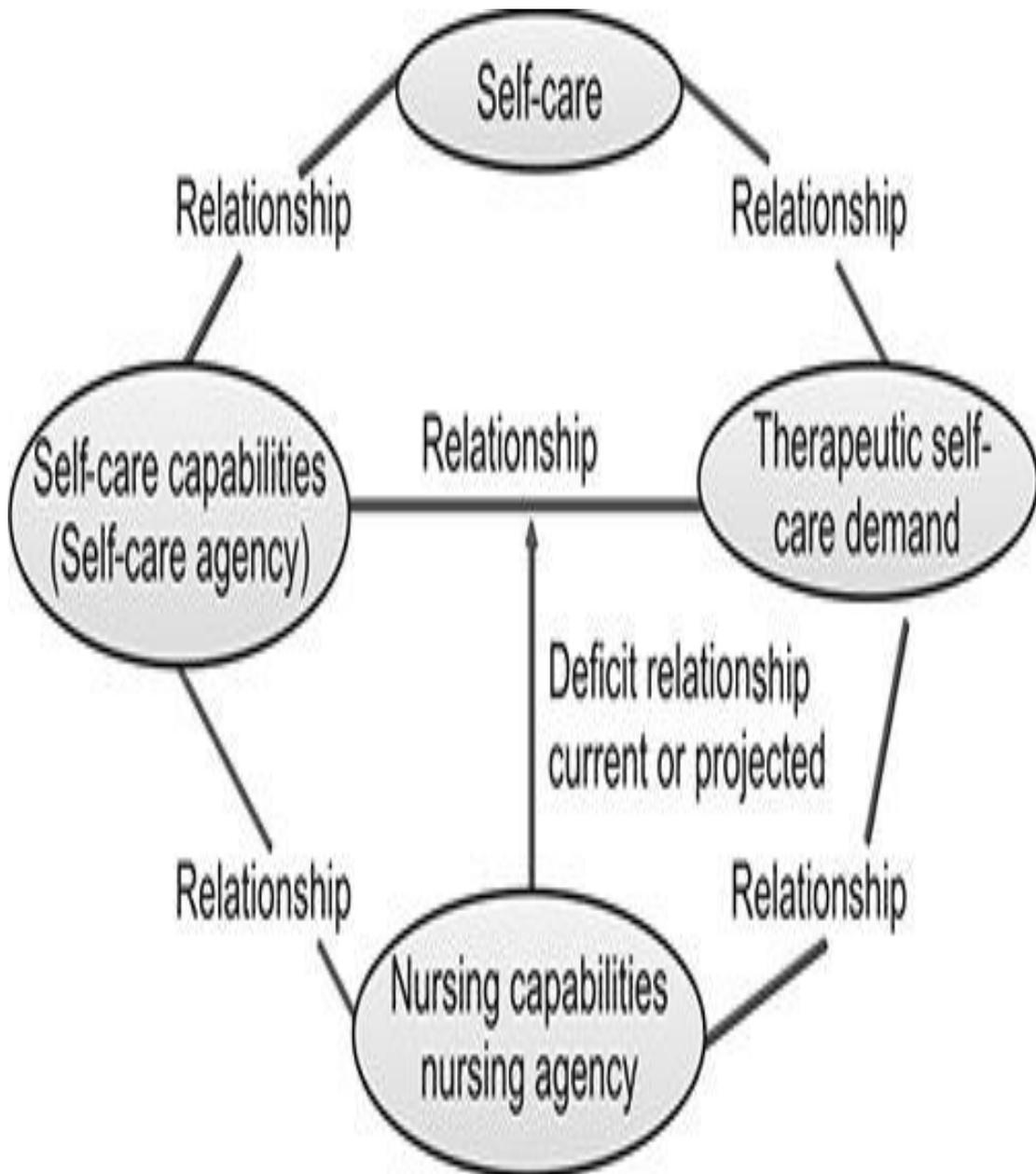
Fig. (2-1) Orem's self-care theory (Orem's, 2001)

2.3.2. Nursing system

A nursing system is a work of art and a product of nursing care. According to this notion, nurses must support patients in meeting their self-care demands. As a result, the self-care deficit theory was created to address the topic of why and when patients/clients require nursing care. The cause for this was owing to the patient's inability to execute their self-care obligations due to a lack of information. As a result, nursing must educate patients/clients and ensure that their well-being and quality of life are adequately maintained and performed to satisfy the self-care gap (Orem, 2001).

Patients are persons who are accountable for their self-care in their everyday living activities, according to the beginning description of Orem's nursing concerns. Only when patients are unable to reach their ideal aim of achieving a healthy lifestyle and wellness do nursing interventions in encouraging self-care become necessary. As a result, nurses intervene by acting as an educator, advocates, and supporters (Snowden *et al*., 2014).

2.3.3. Theory of self-care

Orem described self-care theory as a person's ability to manage or pay attention to him or herself using nursing rules. Patients must be able to do self-care autonomously and also be capable of giving care and meeting the needs of their families, according to Orem's self-care theory. Nursing is defined as the act of providing care to others, as well as the act of doing it deliberately and carefully. The human office is skilled in locating, creating, and transmitting information, to recognize and meet the needs of oneself and others. To develop an efficient self-care program, reciprocal communication between patients and nurses is also required (Katherine & Taylor,2003).

Self-care is, in essence, an individual's deliberate exercise of action to sustain life, attain well-being, and live a healthy lifestyle. Three essential components of a well-defined self-care concept include health deviance, universality, and evolution of self-care requirements (Snowden, *et al*., 2014).

However Patients with DM, for example, are more likely to acquire problems and complication such as lower extremities amputation (diabetic neuropathy), kidney failure or illnesses (diabetic nephropathy), and impaired vision or blindness (diabetic retinopathy) if they are not well-educated in self-care. It is critical to emphasize that self-care is a necessary activity for the patient to sustain and enhance their health. While patients are encouraged to take ownership of their health through self-care, Orem argues that nurses must assist high-risk patients in achieving a healthy and quality lifestyle by actively encouraging them to engage in regular self-care. The next paragraph elaborates on Orem's suggested self-care theory's main focus and claims (Orem, 2001).

Ther fore according to Orem, the most important elements influencing self-care behaviors are social, age, familial history, and economic circumstances. Orem further argues that self-care competence and demand requirements must be matched. There will be no shortage as a result of this. In other words, both the need for self-care and the shortfall in self-care must be fair. Furthermore, Orem believes that nurses must be able to provide good self-care to their patients. Nurses must also encourage and support patients in achieving self-care independence when necessary. In addition, nurses are expected to choose a dependable and successful plan of action that includes the use of applicable technology for patients to practice good self-care. Another important factor, according to Orem, is that to increase and control self-care capacities, all stakeholders engaged in obtaining and giving self-

care must be willing to commit to and participate in the program. (Snowden *et al.*, 2014).

2.3.4. Theory of Self-care Deficit

The self-care deficit theory looks at the link between individual self-care demands and therapeutic self-care. There are two types of self-care deficits: partial and complete. A total deficiency occurs when a person is completely unable to self-care. Partial self-care deficiency, on the other hand, is defined as an individual's incapacity to satisfy the criteria of one or more tasks, such as a patient recovering from surgery (Snowden *et al.*, 2010).

Overall, the theory lays forth a therapeutic self-care method that nurses may use to diagnose and carry out the appropriate activities between two or more persons (nurses and patients). When assessing or evaluating a patient's capacity, assists nurses in determining what sort of self-care deficiency action to provide. It also aids in educating the individual on how to manage or overcome a deficiency (Katherine & Taylor,2003).

2.4. Pathophysiology

Type 2 diabetes mellitus (T2DM) is caused by at least two basic pathogenic mechanisms: (a) a gradual deterioration in pancreatic islet cell function, which results in lower insulin production, and (b) peripheral insulin resistance, which results in a reduction in metabolic responses to insulin. This dynamic relationship between insulin secretion and insulin resistance is necessary for adequate glucose tolerance to be maintained. The shift from normal glucose metabolism control to T2DM happens through a series of altered metabolic states that deteriorate with time. Prediabetes is the earliest stage of the condition, and it is defined as a group of metabolic disorders characterized by a high level of hyperglycemia, which causes a rise in the frequency of nephropathies,

retinopathies, and neuropathies. As we progress through the Type 2 diabetes mellitus temporal sequence, a significant shift in the pancreatic cells that make up the Langerhans islets, which is mostly caused by amylin fibers accumulating on these cells as a result of the polypeptide hormone amyloid polypeptide or IAPP. Work overload owing to biosynthetic overproduction of insulin and IAPP causes IAPP hyper secretion and amylin fiber accumulation in the endoplasmic reticulum, resulting in cell death (Boada *et al*, 2018).

Consider the variations in incretins profiles like as GIP (glucose-dependent insulin tropic polypeptide) and GLP-1 (glucagon-like peptide 1), which are directly linked to glucose homeostasis maintenance. Various risk factors predispose a healthy person to acquire T2DM, but the most important is obesity. BMI has been utilized as a strong indication of T2DM risk in various epidemiological studies. Other risk variables to consider in Type 2 diabetes mellitus include lipotoxicity induced by increased circulating free fatty acids, alterations in body fat distribution, lipoprotein profiles, and glucotoxicity generated by over-stimulation of cells (Boada *et al*, 2013).

Insulin is required for glucose, lipid, and protein metabolism. Except for nerve cells and vascular tissue, insulin promotes the entrance of these molecules into the cell. In the absence of insulin, glucose is unable to enter the cell, resulting in a spike in blood glucose levels (hyperglycemia), which causes the migration of bodily fluid from the intracellular space to the extracellular region, where it is expelled by the renal system. When serum glucose levels reach the renal threshold glucose level (180 mg/dl), glucose spills into the urine, causing glycosuria and an osmotic diversion of water, causing polyuria, and excessive thirst is caused by urinary fluid losses in diabetics (Werner and Roith, 2000).

Because body cells have been unable to utilize glucose yet still require energy, they begin to break down protein and fat for usage by the cells. When a considerable quantity of fat is digested, the acid produced as a byproduct of fat breakdown builds up in the bloodstream and leaks into the urine, resulting in ketonuria. The blood's PH then becomes acidic, leading to severe acidosis. Elevated blood cholesterol levels result from fat breakdown. Due to a considerable loss of water and the accumulation of ketone bodies in their blood, unthreaded diabetic toddlers become acidic and dehydrated (Lissauer and Clayden, 2001).

2.4.1. Pathophysiology of Type I Diabetes

Although there are no statistics on worldwide trends in Type 1 diabetes mellitus prevalence and incidence, data from several high-income nations show an annual increase in the incidence of Type 1 diabetes mellitus in children of between 3% and 4% (Patterson and Dahlquist, 2009)

Males and females are equally affected (Maahs DM, 2010).

Despite type II DM occurring frequently in childhood, onset can occur in adults and 84% of people living with T1DM are adults (Dall *et al.,* 2014).

In high-income nations, Type 1 diabetes reduces life expectancy by around 13 years; however, the prognosis is much worse in countries with inadequate access to insulin. It can be difficult to tell the difference between Type1 diabetes and Type2 diabetes in adults, and misclassifying Type 1 diabetes and Type2 diabetes and vice versa can influence prevalence and incidence statistics (Atkinson, et al., 2014).

A recent study used a Type 1 diabetes genetic risk score on people of European origin who took part in the UK's Bio bank research project and found that 42 percent of T1DM cases developed after the age of 30, accounting for 4 percent of all diabetes cases diagnosed between the ages

of 31 to 60. These people had a lower BMI, used insulin within Twelve months of diagnosis, and were at a higher risk of diabetic ketoacidosis (Thomas, 2019).

Type1 diabetes progresses fast and is most frequent in youngsters, although it can also affect adults. Ketoacidosis may be the initial symptom of the illness in certain people, especially children and adolescents (Jackson *et al.*, 2014).

Acute onset very short time (commonly less than one week) of hyperglycemic symptoms ketoacidosis at the time of diagnosis mostly negative for islet-related autoantibodies; increased serum pancreatic enzyme levels frequent flu-like and gastrointestinal symptoms just before the disease onset are some of the major clinical characteristics of fulminant type I diabetes. The presence of macrophages and T cells in islets implies a faster immune response to virus-infected islet cells, as well as quick elimination of T-cells. While detecting islet autoantibodies has little clinical use in traditional Type 1 diabetes mellitus, it may play a role when a person's diagnosis of Type 1 diabetes mellitus or Type 2 diabetes mellitus is unclear. Nevertheless, rather than being based on the existence of such indicators, the choice to administer insulin must be based on the clinical necessity (Sosenko *et al.*, 2008).

Type I diabetes is most common in childhood and adolescence, although it may strike anybody at any age, including those in the 1980s and 1990s. Hyperglycemia, the breakdown of body fat and protein, and the onset of ketosis are all symptoms of this condition (a buildup of ketone bodies formed during fatty acid oxidation). The loss of the beta cells in the islets of Langerhans in the pancreas causes T1DM. Insulin is no longer created when beta cells are destroyed. Although T1DM can be classed as an autoimmune or idiopathic ailment, the immune-mediated disease accounts for 90 percent of the cases. Insulitis is the first symptom

of the disease, which is a persistent inflammatory reaction to the autoimmune death of islet cells. This process gradually reduces insulin production, resulting in hyperglycemia when 80 percent to 90 percent of beta-cell type I function is lost. This procedure normally takes place over a considerable period in the preclinical stage. Hyperglycemia is thought to be caused by aberrant alpha-cell and beta-cell functioning, with a shortage of insulin and a relative excess of glucagon. Type I diabetes (5 percent to 10 percent of confirmed cases), type II diabetes (90 percent to 95 percent of diagnosed cases), gestational diabetes (2 percent to 5percent of all pregnancies), and various kinds of diabetes (1 percent to 2 percent of diagnosed cases) (LeMone *et al.*, 2011).

2.4. 2. Pathophysiology of Type II DM

Type II DM is a complicated metabolic and endocrine illness caused by the combination of hereditary and environmental variables, which results in varying degrees of insulin dysfunction in peripheral tissues and the pancreatic cell. The key variables that support the development of type II DM include underlying diseases like excessive weight and obesity (Taylor, 2013).

In absolute terms, diabetic persons' insulinemia may be equivalent to that of glycemic people, but it is proportionately inadequate in hyperglycemia situations. Insulin resistance is defined as a reduction in insulin activity at specific levels of the hormone (IR). When cells are exposed to IR, they produce excessive amounts of insulin to compensate for the absence of hormonal activity. Only if there is an insulin deficiency in response to the glucose stimulation can hyperglycemia occur (Durruty *et al.*, 2014).

Type II DM is a chronic condition that progresses in phases. Its natural history is likely to begin as a preclinical stage with infrared radiation 10–20 years before clinical manifestation (IR). Hyper

insulinemia can initially keep fasting and postprandial glycemic levels normal. In the obese IR patient, this stage would be linked with elevated levels of free fatty acids (FFA). Following then, and before DMII emerges, IR is maintained, but the cell's secretory capacity begins to deteriorate and glycemia rises, eventually reaching abnormality levels for fasting glycemia and glucose intolerance, which are stages of prediabetes. Chronic hyperglycemia is a key element in the continuation of damage to pancreatic cells throughout these periods; as it rises and insulin resistance persists, glycemic levels rise, till clinical diabetes is formed, and the insulin secretory abnormalities seen in Type2 diabetes mellitus contribute to insulin resistance. The insulin resistance state is maintained while Type2 diabetes progresses, and the insulin secretory capability steadily declines, eventually leading to insulin hypo secretion, which may necessitate the use of insulin treatment. In Type 2 diabetes mellitus, hyperglycemia is not only a biochemical marker of the illness but is also a persistent element that contributes to the diabetic state's maintenance (Ferranini *et al*., 2011).

In the context of insulin resistance, type II diabetes is caused by inadequate insulin synthesis from beta cells. Insulin deficiency occurs largely in the muscles, liver, and adipose tissue, and is defined as the inability of cells to respond properly to normal amounts of insulin. Insulin typically inhibits glucose release in the liver. In the case of insulin resistance, however, the liver releases glucose into the bloodstream in an improper manner. Individuals range in the proportion of insulin resistance to beta-cell malfunction, with some having largely insulin resistance and just a little fault in insulin secretion, while others have slight insulin resistance and primarily a lack of insulin secretion (David, & Dolores, 2011).

Increased lipid breakdown within fat cells, resistance to and lack of incretin, high glucagon levels in the blood, increased salt and water retention by the kidneys, and inappropriate metabolism regulation by the central nervous system are all potential mechanisms linked to T2DM and insulin resistance. Nevertheless, not everyone with insulin resistance develops diabetes since insulin production by pancreatic beta cells must be impaired as well (Melmed et al., 2009).

Type II diabetes is characterized by fasting hyperglycemia despite the presence of endogenous insulin. Type 2 diabetes can strike at any age, although it is most common in persons in their forties and fifties. It is the most frequent kind of diabetes mellitus. Its transmission is influenced by heredity. In type II diabetes, the amount of insulin generated fluctuates, and despite its availability, insulin resistance in peripheral tissues impairs its activity. The liver generates more glucose than usual, dietary carbs are poorly digested, and the pancreas finally produces insufficient quantities of insulin (Porth, 2011).

Whatever the source, enough insulin is produced to prevent fat breakdown and ketosis; consequently, type 2 diabetes is classified as a non-ketosis form of diabetes. The quantity of glucose available, however, is insufficient to reduce blood glucose levels through glucose absorption by muscle and fat cells. Cellular resistance to the effects of insulin is a crucial element in the development of type II diabetes. Obesity, inactivity, diseases, drugs, and advancing age all raise resistance. Insulin's capacity to regulate glucose uptake and metabolism by the liver, musculoskeletal system, and adipose tissues is reduced in obese people. Because hyperglycemia develops gradually and can remain for a long time before diabetes is diagnosed, over half of newly diagnosed t2dm already have problems. Prescriptions for weight loss and greater activity are frequently the first steps in treatment. Many people

will not require additional therapy if these adjustments can be sustained. When lifestyle improvements are insufficient, hypoglycemic medicines are prescribed. In patients with type II diabetes, a combination of insulin plus hypoglycemic medicine is frequently utilized to obtain the greatest glycemic control (LeMone et al., 2011).
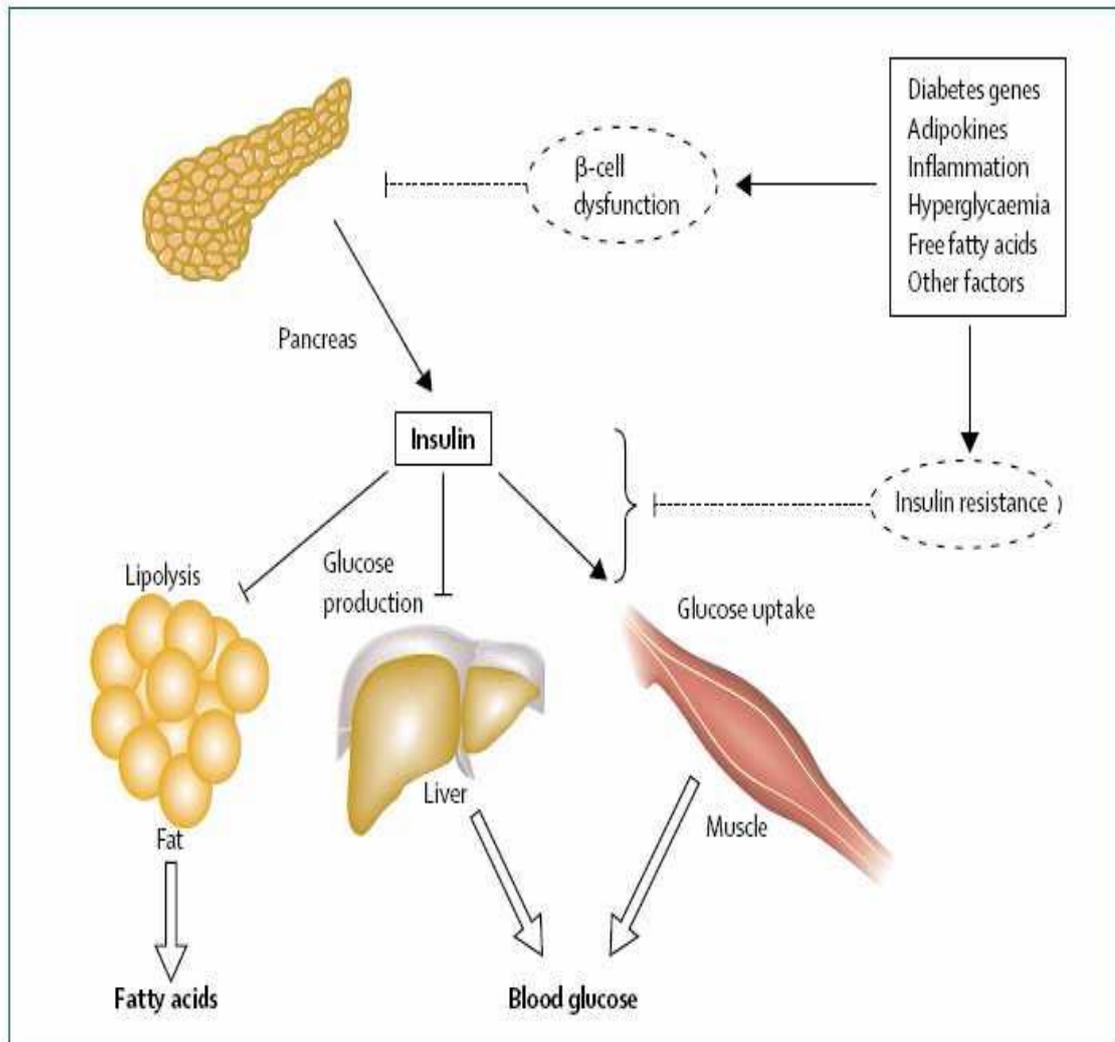
Fig. (2-2): Hyperglycemia and elevated circulating fatty acids in T2DM pathophysiology (LeMone *et al*., 2011).

2.5.1. Risk Factors of T2DM

In both type1and type2 of diabetes, several genetics and environment can induce a progressive decline in-cell mass and/or function, which manifests clinically as hyperglycemia. Patients with all

types of diabetes are at risk of having the same chronic problems once hyperglycemia begins, albeit the rates of development may differ. The development of personalized diabetes therapies would need a better knowledge of the many processes that lead to cell death or dysfunction (Skyler et al., 2017).

The following are the key risk factors for type II DM in siblings or parents. Despite the lack of an human leukocyte antigen (HLA) link, children with type II DM have a 2 to fourfold increased risk of developing type II diabetes and a 30 percent probability of developing glucose intolerance. Obesity is defined as a BMI of at least 27 kg/m2 or being at least 20 percent over the target bodyweight. Increased insulin resistance is linked to obesity, particularly visceral obesity (abdominal fat). Inactivity on the physical level. Race/ethnicity. A history of gestational diabetes mellitus, polycystic ovarian syndrome, or delivering a baby weighing more than 9 pounds in women, hypertension (130/85 in adults), 35 mg/dl HDL cholesterol, and/or a triglyceride level of 250 mg/dl are all risk factors. Metabolic syndrome is a collection of symptoms linked to type2 diabetes. "Hypertension, visceral obesity, low levels of HDL, high levels of triglycerides, increased C-reactive protein, and fasting blood glucose more than 110 mg/dl all raise the risk of diabetes, coronary heart disease, and stroke" (Porth and Matfin, 2009).

T2DM genetic factors DM II is now thought to be a disease with a strong genetic component. As a result, 35–50 percent of the patients have diabetes relatives, compared to 15 percent of persons who do not have this disease. If the parents of patients are surveyed for Type 2 dm, 10–30percent of them have the illness, compared to 1–6 percent of healthy controls. According to the Framingham Child Study, if one of the parents has diabetes, the relative risk for the offspring is 3.6; if both parents have diabetes, the relative risk is 6.0. The risk of diabetes in sons and

daughters of diabetic parents is the same whether the condition is caused by the father or the mother. There is up to 96 percent match for Type 2 dm in monozygotic twins, compared to fewer than 50 percent in fraternal twins. The condition might be caused by any genes that code for enzymes or protein components involved in insulin secretion and activity. The inherited component for the secretory deficiency is stronger than the environmental factor, according to research (Meigs *et al.*, 2000).

2.5.2. Manifestations of Type II Diabetes Mellitus

The person with type II DM experiences a slow onset of manifestations and is often unaware of the disease until seeking health care for some other problem. The hyperglycemia in type II DM is usually not as severe as in type I DM, but similar manifestations occur, especially polyuria and polydipsia. Polyphagia is not often seen, and weight loss is uncommon. Other manifestations are also the result of hyperglycemia blurred vision, fatigue, paresthesias, and skin infections (LeMone *et.al.* 2011).
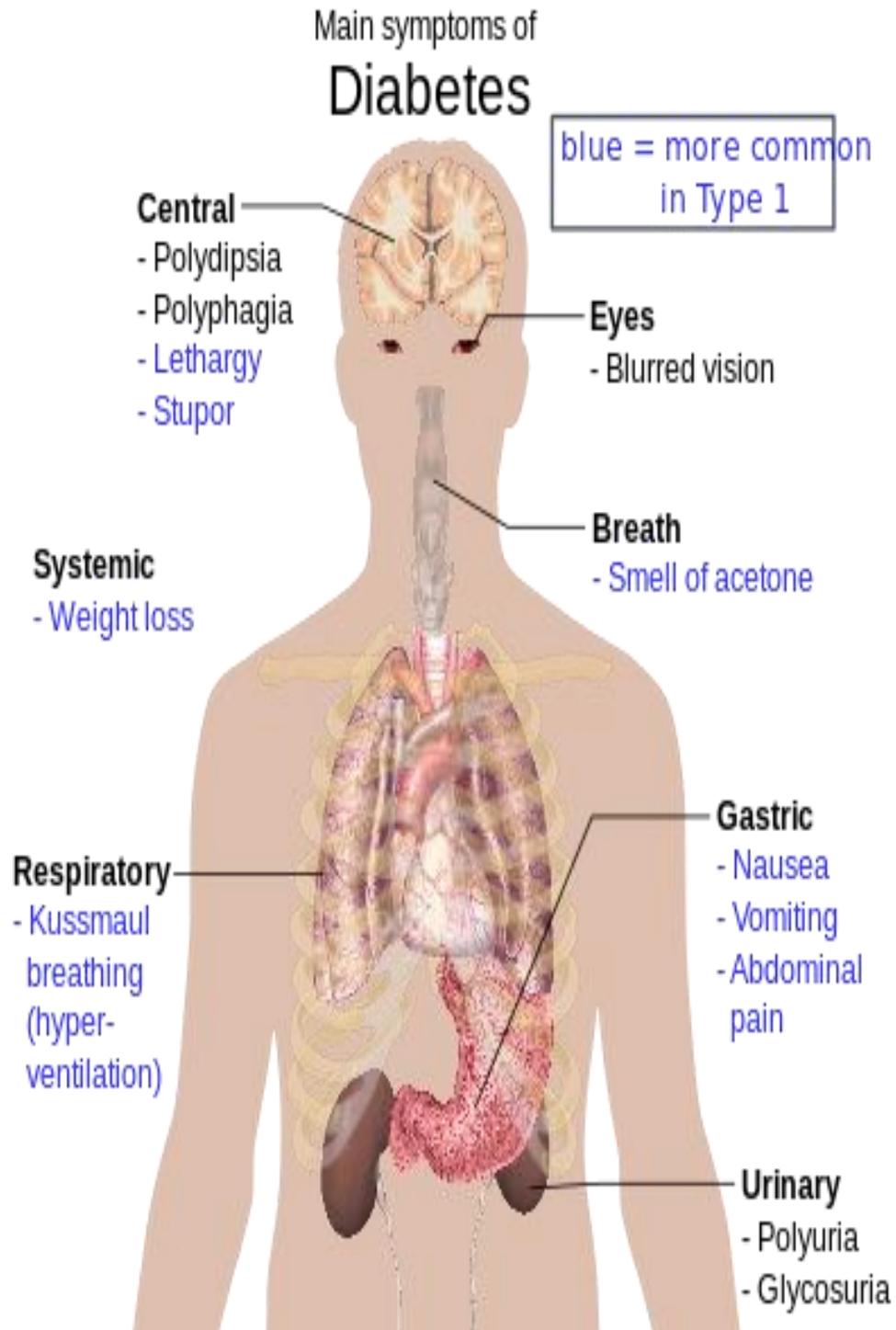
Figure (2-3): An overview of the most common symptoms of diabetes (LeMone *et al*., 2011).

Symptoms of marked hyperglycemia include polyuria, polydipsia, weight loss, sometimes polyphagia, and blurred vision. Impairment of growth and susceptibility to certain infections may also accompany chronic hyperglycemia. Acute, life-threatening consequences of

uncontrolled diabetes are hyperglycemia with ketoacidosis or the non-kenotic hyperosmolar syndrome (American Diabetes Association, 2010).

2.5.3. Diagnosis of Diabetes Mellitus

In the presence of signs and symptoms of diabetes, four diagnostic tests are now recommended: fasting plasma glucose, 2-hour (2-h) post-load plasma glucose following a 75 g oral glucose tolerance test (OGTT), HbA1c, and random blood glucose. People with diabetes had fasting plasma glucose levels of 7.0 mmol/L (126 mg/dl), 2-h post-load plasma glucose levels of 11.1 mmol/L (200 mg/dl), HbA1c levels of 6.5 percent (48 mmol/mol), and random blood glucose levels of 11.1 mmol/L (200 mg/dl) in the presence of signs and symptoms. If elevated levels are seen in asymptomatic patients, it is advised that they be tested again, ideally with the same test, as soon as possible the next day to confirm the diagnosis. A diabetes diagnosis has significant implications for people, not only in terms of their health but also because of the potential stigma that a diabetes diagnosis can bring. This stigma can affect people's employment, health and life insurance, driving status, social opportunities, and other cultural, ethical, and human rights implications (WHO, 2011).

Urine strips in the 1960s and Ames Diagnostics' automated 'do-it-yourself' blood glucose monitoring with glucometers in 1969 transported glucose control from the emergency department to the patient's living room. It gave diabetics a new sense of independence, making the condition more understandable and controlled. (WHO, 2011).

Until the development of the glycosylated hemoglobin (HbA1c) calculation, routine blood sugar checks at predefined intervals were used. That test, which examined blood glucose control over the preceding 3 months (related to red blood cell life), highlighted an essential feature of diabetes management: tight blood glucose control (Kovacs et al., 2002).

Diabetic can be diagnosed using plasma glucose criteria such as fasting plasma glucose (FPG) or 2-hour plasma glucose (2-h PG) values obtained following a 75-gram oral glucose tolerance test (OGTT), or A1C criteria (American Diabetes Association, 2014).

Diagnosis tests are performed for the goal of diagnosing diabetes mellitus, and continuous laboratory tests are performed to assess the efficacy of diabetic therapy. In clinical practice, the definition of normal blood glucose levels varies depending on the laboratory that does the test (LeMone, et al., 2011).

A glucose tolerance test revealed fasting plasma glucose of 7.0 mmol/l (126 mg/dl) and plasma glucose of 11.1 mmol/l (200 mg/dl) two hours after the oral dosage. Another way to diagnose diabetes is to have a random blood sugar of higher than 11.1 mmol/l (200 mg/dL) in conjunction with usual symptoms or glycated hemoglobin (HbA1c) of 48 mmol/mol (6.5 DCCT percent) (Westman, *et al.*, 2018).

An International Expert Committee comprised of representatives from the American Diabetes Association (ADA), the International Diabetes Federation (IDF), and the European Association for the Study of Diabetes (EASD) recommended a 48 mmol/mol (6.5 DCCT percent) threshold for diagnosing diabetes in 2009. The American Diabetes Association approved this proposal in 2010. Unless the person has characteristic symptoms and blood sugars of >11.1 mmol/l (>200 mg/dl), positive tests must be repeated. (American Diabetes Association, 2012).

HbA1c is now formally endorsed in many countries as a diagnostic test for (type II) diabetes as well as for monitoring, although some debate continues regarding its applicability for diagnosis (Diabetes Care, 2011).

Several organizations around the world have recommended that diabetes mellitus can be diagnosed using one of the following tests:

glycated hemoglobin A1C (HbA1c), fasting plasma glucose (FPG), or oral glucose tolerance test (OGTT). The advantages of using HbA1c for the diagnosis of diabetes include its robust stability at ambient temperature, and the ability to use non-fasting, random blood samples, allowing this test to be performed at any time of the day (Sacks, 2011).

The fructosamine test for the diabetic is a blood test that examines average blood glucose levels during the previous two or three weeks. It is comparable to the hemoglobin A1C test, which evaluates average blood sugar over the previous two to four months, but it is less popular since the shorter time frame isn't enough to provide a long-term prognosis (American Diabetes Association, 2020).

Furthermore, rather than glycated hemoglobin, the fructose amine test examines glycated protein in the blood. Glucose molecules in the blood bind to proteins. Because these proteins circulate in the circulation for 14 to 21 days, testing them gives you an idea of how much sugar is in your blood throughout that time (Nansseu *et al.,* 2015).

When further information is needed, the fructosamine test is utilized. It is used in conjunction with blood glucose tracking when a person's medication or insulin has recently changed, and it can assist assess the success of new therapies in only a few weeks rather than waiting months for an A1c test. The test can also be performed throughout pregnancy to monitor how your body is evolving (Danese *et al.,* 2015).

2.5.4. Complications of Diabetes Mellitus

In the previous three decades, the global incidence of DM has quadrupled, and it is currently the ninth greatest cause of death. Diabetes affects one out of every eleven people on the planet; with T2DM accounting for 90 percent of cases (T2DM). Asia is a significant hotspot for the worldwide T2DM pandemic, with China and India serving as the

top two epicenters. Individual vulnerability to T2DM is partially determined by genetic predisposition, but a poor diet and sedentary lifestyle are major drivers of the present worldwide epidemic early developmental variables (such as prenatal exposures) also have a role in susceptibility to T2DM later in life. Many cases of T2DM can be avoided by changing one's lifestyle, such as keeping a healthy weight, eating a balanced diet, remaining physically active, avoiding smoking, and drinking alcohol in moderation. The majority of T2DM patients experience at least one complication, with cardiovascular problems being the predominant cause of morbidity and death (Zheng *et al*., 2018).

DM patients, regardless of type, are at an elevated risk of complications affecting a variety of bodily systems. Symptoms include alterations in blood glucose levels, abnormalities in the cardiovascular system, increased vulnerability to infections, neuropathies, and periodontal disease (LeMone *et al*., 2011).

Diabetes is one of the primary causes of blindness, kidney failure, and lower limb amputation in almost every high-income nation. Diabetes is currently one of the main causes of mortality, owing to an increased risk of cardiovascular disease and stroke among diabetics (cardiovascular disease). Aside from the human misery that diabetes-related problems create, the economic consequences to persons with diabetes, as well as their jobs, are enormous. Healthcare expenditures, missed wages, and economic costs to society as a whole, such as lost productivity and accompanying lost prospects for economic development, are all included. Even if there are no symptoms to alert the individual to the presence of diabetes, chronic elevations in blood glucose can eventually cause tissue damage and, as a result, illness. While tissue damage may be detected in many organ systems, eyes, the kidneys, peripheral nerves, and vascular trees are the ones that show the

most serious, and often deadly, diabetic effects (International Diabetes Federation Atlas, 2009).
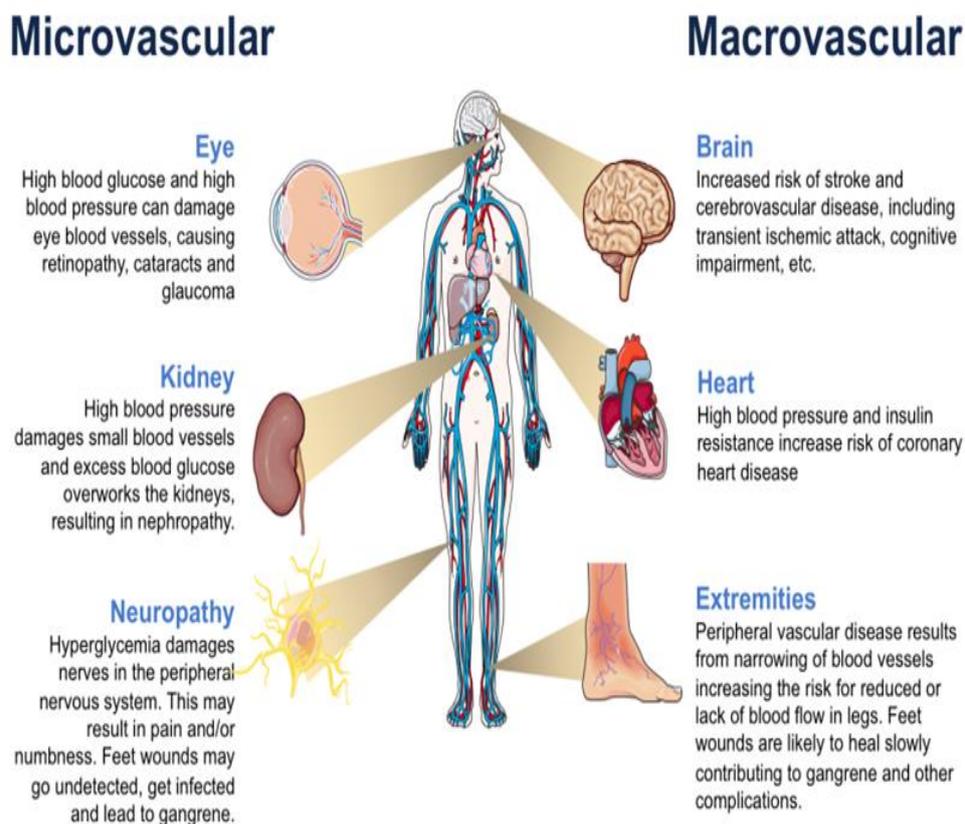
Fig. (2-4): The most serious diabetic complications (Singh, 2014).

Hyperglycemia, coma, shakiness, hunger, nausea, and rapid pulse are all symptoms of diabetic ketoacidosis (DKA). Hypotension is a condition in which a person's blood pressure Skin that is pale and cold (Nathan *et al.*, 2013).

Chronic Complications Alterations in the cardiovascular system Micro vascular difficulties affect the smallest blood arteries in the body, such as those in the eyes (retinopathy), kidneys (nephropathy), and neurons (neuropathy) (leading to neuropathy). In later stages of the

illness, those with poorly regulated blood glucose levels may experience one or more of these problems. Diabetics, in addition to maintaining the condition of their eyes and kidneys, must also take care of their feet. Surprisingly, multiple large population studies have found that active blood glucose control (i.e., keeping blood glucose levels within a tight range) can prevent or delay the onset of these problems (Nathan *et al*., 2013).

Larger blood arteries, such as those that supply the heart, brain, and limbs, are affected by macro vascular problems. These issues are caused by blood artery constriction due to aging, inflammation, lipid accumulation, and other factors. Cardiomyopathy, rheumatoid arthritis, stroke, osteoporosis, and the aging process are all possible complications of big vessel injury (Singh et al., 2014).

Diabetic foot infection (DFI) is a frequent and difficult issue among diabetics. Individuals with diabetes may not feel pain due to nerve loss and numbness, and foot ulcers may go untreated for lengthy periods. Infections in these ulcers can also go untreated, and even when they are, they can take a long time to recover (due to peripheral artery disease). Ulcers and infections can develop into gangrene and need amputation in severe circumstances (Uçkay et al., 2015).

Figure (2-5): Ulceration in the diabetic's foot as a result of a trauma (LeMone *et al.,* 2011).

Diabetes-related foot disorders are prevalent and costly, and diabetics account for over half of all amputation hospital admissions. Patients with DM account for more than 40 percent of major amputation hospitalizations and 73 percent of minor amputation emergency department admissions in the United Kingdom. Because most diabetic amputations are preceded by foot ulceration, a full understanding of the causes and treatment options for ulceration is critical. In most Western nations, the yearly incidence of diabetic foot ulcers is around 2%, while greater rates have been observed in particular diabetic populations, such as Medicare beneficiaries (6%) and US veterans (5 percent). Although the lifetime risk of foot ulcers was previously thought to be 15–25 percent, new research suggests that it might be as high as 34 percent. "Diabetic gangrene is not heaven-sent, but earthborn," said famed diabetes specialist Elliott P. Joslin, after observing several clinical examples of diabetic foot illness. As a result, foot ulcers are not an unavoidable consequence of diabetes; rather, ulcers form as a result of a combination of unique lower-limb diseases and environmental dangers (Armstrong *et al.,* 2017).

Patients have no known risk factors, and the likelihood of getting a foot ulcer is quite minimal. As a result, this recommendation only includes therapies directed particularly at preventing foot ulcers in at-risk individuals. Patients having a history of DFU or amputation are regarded to be at a higher risk for ulceration than those who do not have these issues (Crawford *et al.,* 2015).
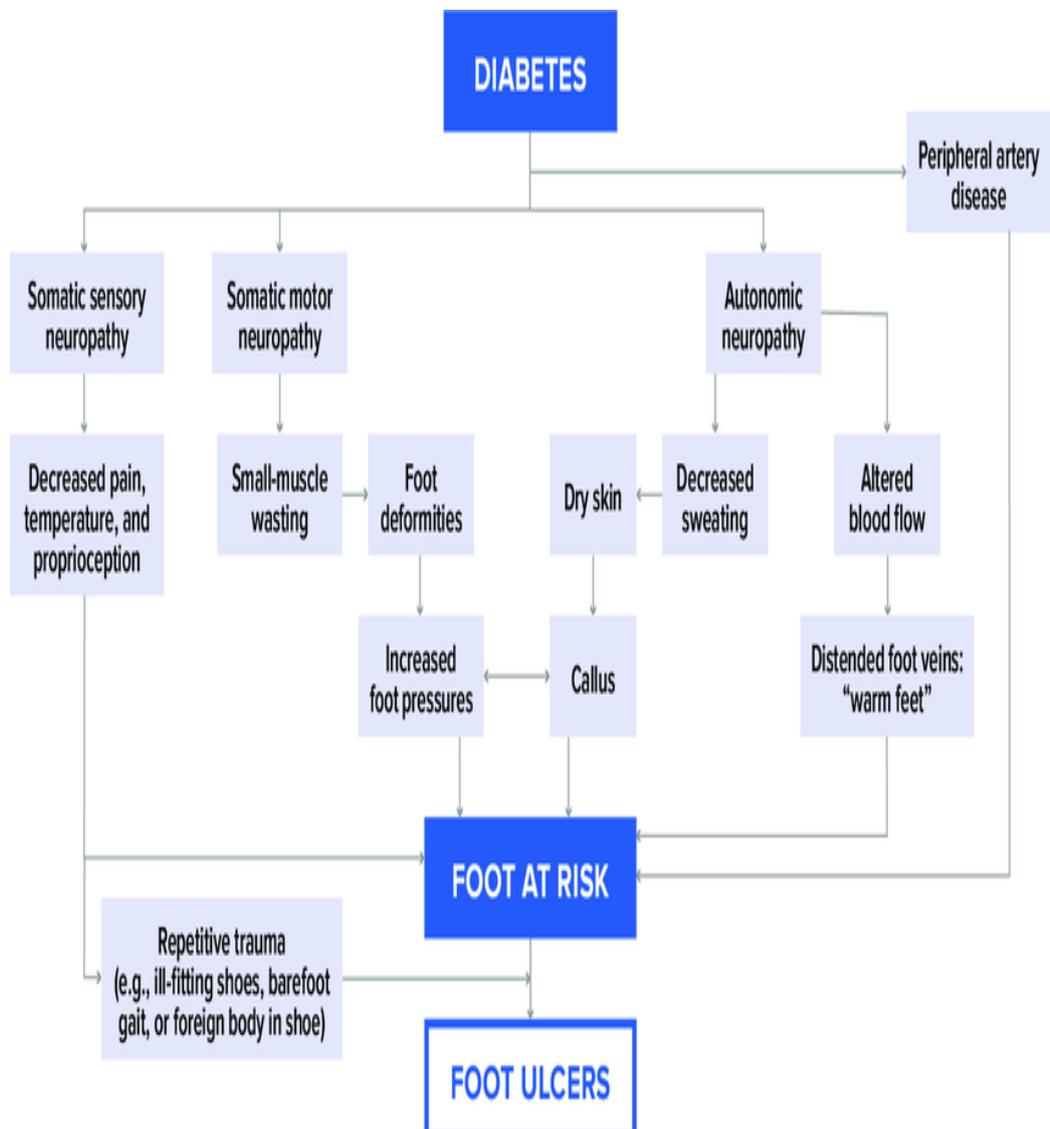
Fig. (2-6) Pathways to diabetic foot ulceration (Boulton *et al.,* 2018).

2.5.5. Prevention

Pre-diabetes and type 2 diabetes mellitus (T2DM) can develop in genetically vulnerable individuals in tandem with a weight (fat) increase, according to evidence from observational studies and randomized trials. As a result, studies have shown that weight reduction might result in Type 2 diabetes mellitus remission in a dose-dependent way. In 80 percent of individuals with obesity and Type2 diabetes mellitus, a weight loss of 15 kg accomplished with calorie restriction as part of an intensive treatment program can result in Type2 diabetes mellitus remission. Long-term weight reduction maintenance, on the other hand, is difficult. Obesity and Type 2 diabetes mellitus are linked to reduced glucose absorption in the brain, which reduces the satiating impact of dietary carbohydrates; hence, carbohydrate restriction may aid weight reduction and optimize metabolic advantages (American Diabetes Association. 2018).

Increases in physical activity and fitness, when paired with calorie restriction and weight loss, are also key contributors to Type 2 diabetes mellitus remission. Preliminary research suggests that a precision dietary management approach that stratifies patients based on their baseline glycaemic state can assist optimize carbohydrate, lipid, and dietary fiber recommendations. This method might help with weight loss maintenance and glycemic management. Future studies should concentrate on gaining a better understanding of individual responses to nutritional therapy and using these results in clinical practice (Magkos *et al.,* 2020).

Diabetic treatment begins with a healthy diet and regular exercise, with more activity producing better benefits. Aerobic exercise improves insulin sensitivity and lowers HbA1c levels. Resistance training is also beneficial, and combining the two types of exercises may be the most effective. It is essential to follow a diabetic diet that aids weight

reduction. While the optimum diet for this is debatable, a low glycemic index or low carbohydrate diet has been reported to help with blood sugar management. For at least six months, culturally relevant education may assist persons with type 2 diabetes to regulate their blood sugar levels. If lifestyle adjustments in people with moderate diabetes do not improve blood sugar levels after six weeks, medicines should be explored. There is insufficient information to say if lifestyle changes affect mortality in those who already have T2DM (Schellenberg, *et al*., 2013).

Individuals with diabetes must assume an active role in their care. The goals of treatment for diabetes are to prevent or delay complications and maintain quality of life. Treatment goals and plans for meeting them should be created collaboratively with patients (Figure**7**) (Diabetes Care, 2018).

REVIEW AND AGREE ON MANAGEMENT PLAN

- Review management plan
- Mutual agreement on changes
- Ensure agreed modification of therapy is implemented in a timely fashion to avoid clinical inertia
- Decision cycle undertaken regularly (at least once/twice a year)

ASSESS KEY PATIENT CHARACTERISTICS

- Current lifestyle
- Comorbidities, i.e., ASCVD, CKD, HF
- Clinical characteristics, i.e., age, HbA$_{1c}$, weight
- Issues such as motivation and depression
- Cultural and socioeconomic context

ONGOING MONITORING AND SUPPORT INCLUDING:

- Emotional well-being
- Check tolerability of medication
- Monitor glycemic status
- Biofeedback including SMBG, weight, step count, HbA$_{1c}$, blood pressure, lipids

GOALS OF CARE
- Prevent complications
- Optimize quality of life

CONSIDER SPECIFIC FACTORS THAT IMPACT CHOICE OF TREATMENT

- Individualized HbA$_{1c}$ target
- Impact on weight and hypoglycemia
- Side effect profile of medication
- Complexity of regimen, i.e., frequency, mode of administration
- Choose regimen to optimize adherence and persistence
- Access, cost, and availability of medication

IMPLEMENT MANAGEMENT PLAN

- Patients not meeting goals generally should be seen at least every 3 months as long as progress is being made, more frequent contact initially is often desirable for DSMES

AGREE ON MANAGEMENT PLAN

- Specify SMART goals:
  - **S**pecific
  - **M**easurable
  - **A**chievable
  - **R**ealistic
  - **T**ime limited

SHARED DECISION MAKING TO CREATE A MANAGEMENT PLAN

- Involves an educated and informed patient (and their family/caregiver)
- Seeks patient preferences
- Effective consultation includes motivational interviewing, goal setting, and shared decision making
- Empowers the patient
- Ensures access to DSMES

ASCVD = Atherosclerotic Cardiovascular Disease
CKD = Chronic Kidney Disease
HF = Heart Failure
DSMES = Diabetes Self-Management Education and Support
SMBG = Self-Monitored Blood Glucose

Fig (2-7) Decision cycle for patient-centered glycemic management in type 2 diabetes (Diabetes Care, 2018)

2.6. Self-Care Behavior in Patients with T2DM

Self-care is defined as a person's effective, learned, informed, and objective actions and behaviors that are carried out in real-life settings by the individual or his family. The goal of self-care is to govern the elements that influence patient growth and performance in terms of life, health, and well-being. The overall abilities and information that a person has and employs for his practical endeavors affect self-care behavior (Godarzi *et al*., 2011).

Patients with T2DM are responsible for more than 95% of their care. Between visits, the medical staff has less influence over the patients (Firooz *et al.,* 2016).

This condition necessitates a unique type of lifelong self-care. Self-care is an effective and functional process guided by the patients that aim to improve physical conditions or maintain healthcare through actions such as diet, physical exercise, blood sugar monitoring, and searching for preventive healthcare or therapeutic services, as well as applying prescribed therapies to diseases and disorders such as diabetes. The bulk of evidence shows that diabetic self-care improves blood sugar management, which leads to improved healthcare outcomes (Didarloo *et al.,* 2011).

Diabetes self-care has dramatically reduced the risk of hospitalization and has either averted or delayed the disease's acute and chronic side effects. It also contributes to bettering the quality of life and lowering expenditures. Several studies have highlighted the relevance of self-care in the management of diabetes mellitus (Koponen et al., 2017).

Self-care is the ability of individuals, families, and communities to promote health, prevent disease, maintain health, and cope with illness and disability with or without the support of a healthcare provider (World Health Organization, 2018).

The American Association of Diabetes Educators (2013) highlighted elements of self-care activities that provide diabetic patients with beneficial skills and information. Eating healthy or medical nutrition therapy, regular physical activity, daily self-monitoring of blood sugar, medication adherence, problem-solving, reducing the risk of diabetes complications by quitting smoking, having regular eye, foot, and dental examinations, and healthy coping with the disease" are all examples of self-care practices. Healthy eating or medical nutrition

therapy, physical exercise, self-blood glucose monitoring, and medication-taking are the self-care behaviors that have been widely studied as they impact directly on glycemic control (Gesare, 2015).

Patient engagement with diabetes self-care is critical to reducing morbidity and mortality. Social media is one form of digital health that is available for diabetes self-care, although its use for peer-to-peer communication has not been systematically described, and its potential to support patient self-care is unclear (Elnaggar *et al*., 2020).

T1DM is a chronic condition that requires lifelong management. Diabetic self-management entails eating a nutritious diet, exercising regularly, taking the proper quantity of insulin, and self-monitoring blood glucose levels to avoid frequent diabetes-related problems (Diabetes Care, 2017)

Adults with T1DM have an increased risk of cardiovascular disease (CVD), however, this risk can be considerably lowered by managing traditional CVD risk factors (like blood pressure, cholesterol, and smoking) (Rawshani*, et al*., 2017).

Emerging adults with T1DM may have a decent overall quality of life at this time, but they may experience more diabetic distress and have poorer self-management than older people with type 1 diabetes (age >30 years) (Vallis, *et al*., 2018).

In older people who are also coping with diabetes-related problems, poor glycemic control, and prolonged diabetic duration are linked to cognitive loss (Diabetes Care, 2017)

2.6.1. Physical Activity

More than 70 % of type II diabetes cases are caused by overweight and obesity. In many cases, a proper diet and increased physical activity are effective in the prevention and treatment of insulin resistance and pre-diabetes, which usually prevents the development of the disease.

However, the recommendations for physical activity in type 2 diabetics differ from those for healthy people (Klimek et al., 2019).

Physical activity is an essential part of the prevention and treatment of DM2. Studies have shown that regular physical activity and even a small reduction in body mass can reduce the risk of morbidity at any age. According to WHO guidelines, all healthy adults should perform at least 150 minutes of moderate-intensity aerobic exercise or at least 75 minutes of intensive aerobic exercise every week. The benefits of regular physical activity are a reduced risk of type II diabetes, ischemic heart disease, stroke, hypertension, colon cancer, breast cancer, osteoporosis, and depression (Klimek *et al*., 2014).

For T2DM, the American College of Sports Medicine and the American Diabetes Association suggests at least 150 minutes per week of moderate (50 percent -70 percent of maximum heart rate) to vigorous (> 70 percent of maximum heart rate) physical exercise (American Diabetes Association. 2010).

Regular physical exercise has been demonstrated to improve glucose control and other health-related outcomes in T1DM, while the data is limited (Yardley *et al*., 2014)

However, because diabetes patients have a lower athletic performance capacity than healthy people, the suggested intensity and length of exercise may place a physical strain on them and force them to stop exercising. When compared to those without diabetes, patients with T2D had reduced energy expenditure, number of movements, and duration of physical exercise (Agour *et al*., 2013).

Exercise is organized, scheduled physical activity, whereas physical activity encompasses all movement that boosts energy usage. Exercise enhances blood sugar control in T2DM, lowers cardiovascular

risk factors, aids weight reduction, and boosts happiness (Chen *et al.*, 2015).

The problems of blood glucose management differ depending on the type of diabetes, the activity level, and the prevalence of diabetes-related comorbidities. Physical activity is a well-known non-pharmacological treatment option for improving insulin action and glycemic control, as well as lowering cardiovascular disease risk factors (American Diabetes Association, 2016).

Regular physical exercise improves various aspects of health-related physical fitness, including cardiorespiratory resistance, muscle strength, body composition, muscular resistance, and elasticity. Although it is generally suggested to engage in physical exercise for a long amount of time (30–60 minutes each session), in recent years, the advantages of physical activities other than those that are traditionally prescribed (e.g., moderate sessions of less than 20 minutes) have been highlighted (Plowman & Smith, 2013).

Diabetes is frequently linked to a sedentary lifestyle, or at least lower amounts of physical exercise. This substantial and consistent link between sedentary time and diabetes was shown to be irrespective of physical activity levels, emphasizing the relevance of sedentary behavior as a unique behavior (Wilmot *et al.*, 2012).

2.6.2. Self-Monitoring of Blood Glucose

Excellent glycemic management is one of the most important aspects of avoiding and treating diabetes-related problems, which necessitates extensive education, efficient lifestyle modifications, active self-monitoring, and a pharmaceutical regimen (Muralidharan *et al.*, 2017).

Traditional self-management strategies, such as no personalized instruction, inadequate blood glucose monitoring, and delayed face-to-

face contact, are leading to uncontrolled glycemic goals and catastrophic diabetes outcomes as a result of social development (Coppola *et al.,* 2016).

Today, the use of modern health technologies – computer or mobile phone-based self-management – might potentially play a key role in the treatment of chronic diseases, notably diabetes (Haddad *et al.,* 2014).

Well, Doc mobile diabetes management was initially employed in diabetic patients in 2008, and results showed that glucose control was greatly improved (Quinn *et al.,* 2008).

According to a systematic review and meta-analysis, smartphone-based self-management apps provide moderate advantages in terms of not only lowering glycated hemoglobin levels (0.4 percent) but also improving diabetes education and making lifestyle modifications (Cui *et al.*, 2016).

Self-monitoring of blood glucose has proved to be essential among patients with diabetes as it allows them to evaluate their response to therapy and assess whether their glycemic targets are being achieved. It is also useful in preventing hypoglycemia and adjusting medications, postprandial insulin doses, medical nutrition therapy, and physical exercise. The optimal frequency and timing of self-blood glucose monitoring in patients with type II diabetes on non-insulin therapy have remained controversial (Farmer *et al*., 2007).

Self-monitoring of blood glucose (SMBG) in the management of diabetes plays a key role in many large-scale outcome studies, acting as an important contributor to results. SMBG has many proven benefits, such as aiding the achievement of hemoglobin A1C (HbA1c) targets (Allemann, 2009).

Several studies have incorporated additional self-care activities such as food, exercise, and education, making it impossible to determine the impact of Self-Monitoring of Blood Glucose (SMBG) on glycemic management on its own. SMBG assists people with diabetes to keep track of their blood sugar levels and reduce the risk of hypoglycemia. The American Diabetes Association (ADA) advises that all diabetic patients be taught a strategy of glycemic control monitoring. The timing of SMBG is extremely personalized, and it is determined by the person's diagnosis, overall illness management, and physical condition. For people with type I diabetes who use repeated insulin injections of insulin pump treatment, SMBG is advised three or more times per day. Patients with type II diabetes who do not use insulin should be able to achieve their glucose targets with just monitoring. In patients with type II diabetes, postprandial blood glucose levels are frequently the most helpful indicator of glycemic control (American Diabetes Association, 2009).

According to the United States Food and Drug Administration (FDA), various factors influence glucose meter performance, including the accuracy of blood glucose test findings. The degree of accuracy is influenced by the quality of the meter and test strips, as well as instruction on how to operate the meter. Other variables, such as hematocrit, might cause incorrectly high or negative results. Patients with a greater hematocrit will test incorrectly low in blood glucose, whereas those with a lower hematocrit would test abnormally high. Anemia and sickle cell anemia are two disorders that might have an impact on hematocrit levels. Other substances, such as high dosages of various drugs, might lead to incorrect findings. The sensitivity of meters and supplies to drugs varies. Uric acid (a naturally occurring chemical in the body that can be more concentrated in certain persons with DM),

glutathione (an anti-oxidant also known as GSH), and ascorbic acid (vitamin C) have all been shown to cause problems. Appropriate supplies and sample volume are used. The test strips must be compatible with the glucose meter, not obsolete, and not have been exposed to air or humidity, since these factors might affect strip sensitivity. Inadequate blood on the testing strip leads to incorrect findings. Although a meter may suggest that there is enough blood on the test strip, it is advisable to look for capillary blood in the receptacle (LeMone *et al.,* 2011).

2.6.3. Medication of DM.

2.6.3.1. Oral Hypoglycemic Agents

To avoid long-term problems from developing, effective diabetes care necessitates thorough treatment of several risk factors; including hypercholesterolemia, hypertension, and hyperglycemia. Treatments available for achieving optimal glycemic control have substantially grown in recent years. Currently, there are five types of oral medicines and two types of injectable therapy available (Fig. 8). Clinicians face a difficult task in selecting which therapy combination is best for a person with type II diabetes, with the suggestion being that a maximum of three oral medicines be utilized (National Institute for Health and Care Excellence, 2015).
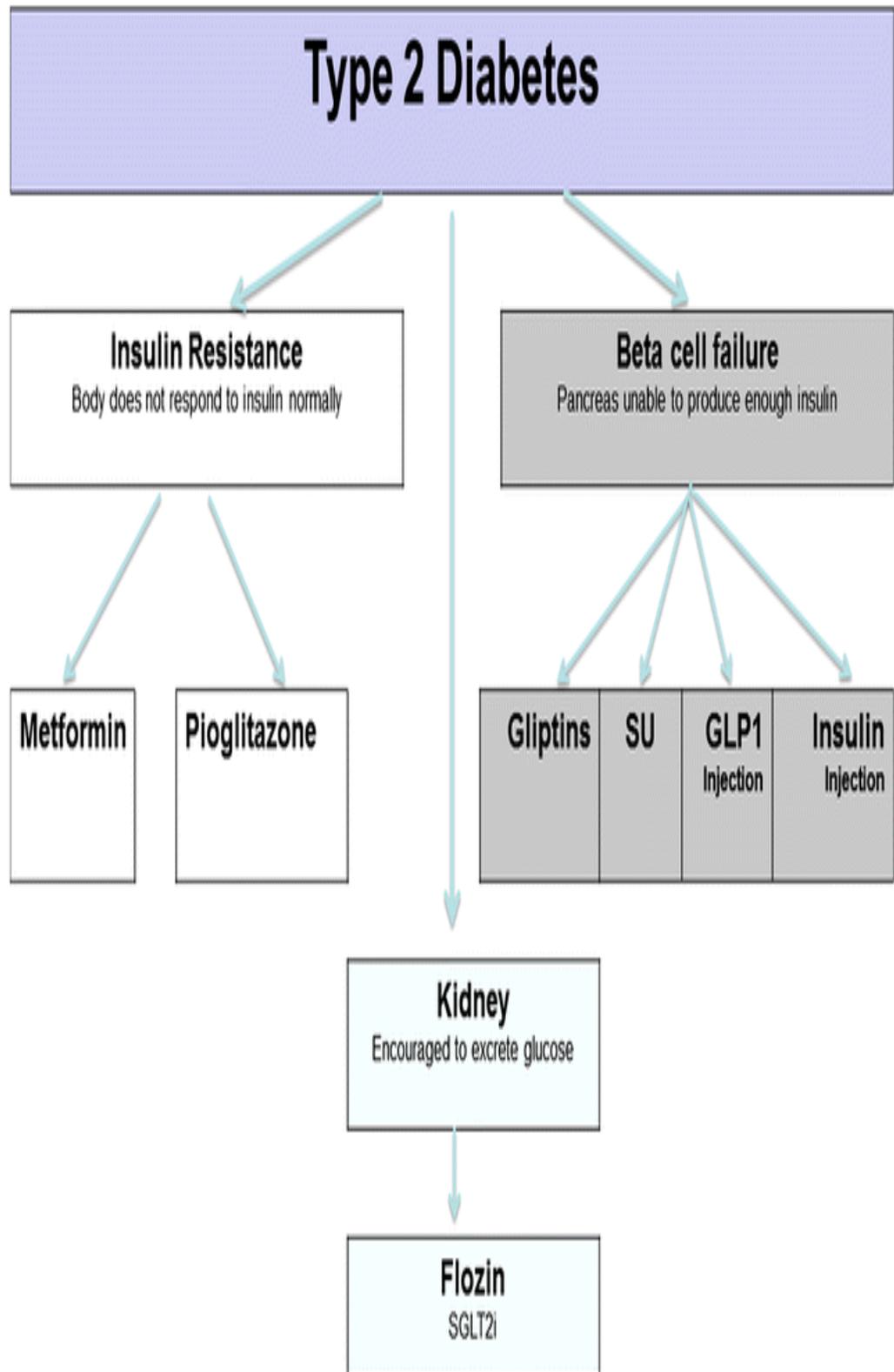
Fig.(2-8) Diabetes treatment tree. GLP1 glucagon-like peptide-1, SGLT2i sodium-glucose co-transporter-2 inhibitor, SU sulfonylurea (National Institute for Health and Care Excellence, 2015).

The most effective management of diabetes mellitus demands anointer professional approach involving both lifestyle modifications with diet and exercise, and pharmacologic therapies as needed to meet individualized glycemic goals. Healthcare practitioners must encourage patients to combine lifestyle modifications with oral pharmacologic agents for optimal glycemic control, particularly as type II diabetes mellitus progresses with continued loss of pancreatic beta-cell function And insulin production (American Diabetes Association, 2019).

Current pharmacologic therapy for diabetes includes oral hypoglycemic agents and insulin. Oral hypoglycemic drugs are divided into eight categories: sulfonylureas, biguanides, glinides, thiazolidinedione's, alpha-glycosidase inhibitors, Glucagon like peptide-1 receptor agonists(GLP-1), DPP4 inhibitors, and Sodium-glucose Cotransporter-2 inhibitors (SGLT2) (American Diabetes Association, 2020).

Although these drugs have relevant therapeutic effects on diabetes, their long-term maintenance of the effect has not been achieved, and their responses in individuals also show differences (Fodor et al., 2019).

Moreover, some agents produce adverse effects, such as hypoglycemia, weight gain, gastrointestinal discomfort, urogenital infections, discomfort at the injection site, and heart failure (American Diabetes, 2020).

Insulin resistance is the fundamental pathophysiological aberration in the majority of people who acquire type 2 diabetes. Insulin resistance is caused by a change in the structure of the insulin receptor on the surface of muscle and other cells. As a result, the insulin molecule is unable to connect to the receptor, which closes the glucose channel and limits glucose absorption by the cells. Many ethnic groups suffer from inherent insulin resistance, which is exacerbated by weight gain. T2dm is

six times more frequent in South Asians, and 3 times more common in African and African Caribbean populations (Diabetes UK, 2016).

In muscle and fat, thiazolidinedione reduces peripheral insulin resistance. It proved successful at controlling blood sugar levels, but it is harmful to the liver. Glycosidase inhibitors also help to reduce carbohydrate absorption and postprandial hyperglycemia. As a result of the risks associated with these drugs, their use is restricted in children and adolescents (Rudolfh *et al.,* 2006).

The American Diabetes Association (ADA) and European Association for the Study of Diabetes (EASD) released a consensus statement on how to treat hyperglycemia in diabetic patients, which includes a mix of lifestyle modifications and antidiuretic medication (Nathan et al., 2009).

Patients with type 2 diabetes should be checked for these problems at the time of diagnosis and should be followed up on as the condition progresses. Although randomized controlled studies have established that lifestyle treatments enhance glycemic control, integrating these interventions into clinical practice and patients' everyday life remains a difficulty. Outside of clinical studies, patients are left alone. Because of the complexity focused on trying to quantify the day-to-day activities of patients quantitatively, assessing self-care behaviors in the patient is challenging. Patients' various sociocultural settings have an impact on some self-care habits such as food and physical exercise (Nathan *et al*., 2009).

Treatment plans are likewise tailored to the person; there is no universal benchmark against which these behaviors can be measured. Only a few types of research have looked at self-care among African individuals with type 2 diabetes. This occurs in the context of a lack of

formal diabetes education and a poor level of literacy among T2DM (Rafique et al., 2006).

Insulin is a pancreatic internal secretion produced by clusters of cells known as islets of Langerhans. Insulin-producing cells in the pancreas emit the hormone insulin in response to high blood glucose levels. Insulin is administered into the body by patients who have type I diabetes, which is caused by the destruction of insulin-producing cells. This is the most frequent kind of diabetes in children and young people, and they are completely reliant on insulin to live. People with type 2 diabetes may also use insulin. Since Frederick Banting and Charles Best's groundbreaking discovery of insulin in 1921, great strides have been achieved in research and development in developing genetically modified human insulin. Insulin was once generated from the pancreas of calves and pigs, which was a scarce supply. (Atlas, 2009)

FIGURE 1.2   Insulin production and action

Raises Blood Sugar   High Blood Sugar

Promotes insulin release

Glucagon

Liver
Glycogen   Glucose

Stimulates breakdows of glycogen

Stimulates formation of glycogen

Pancreas

Insulin
Stimulates glucose uptake from blood

Tissue Cells (muscle, brain, fat, etc)

Promotes glucagon release

Lowers Blood Sugar   Low Blood Sugar
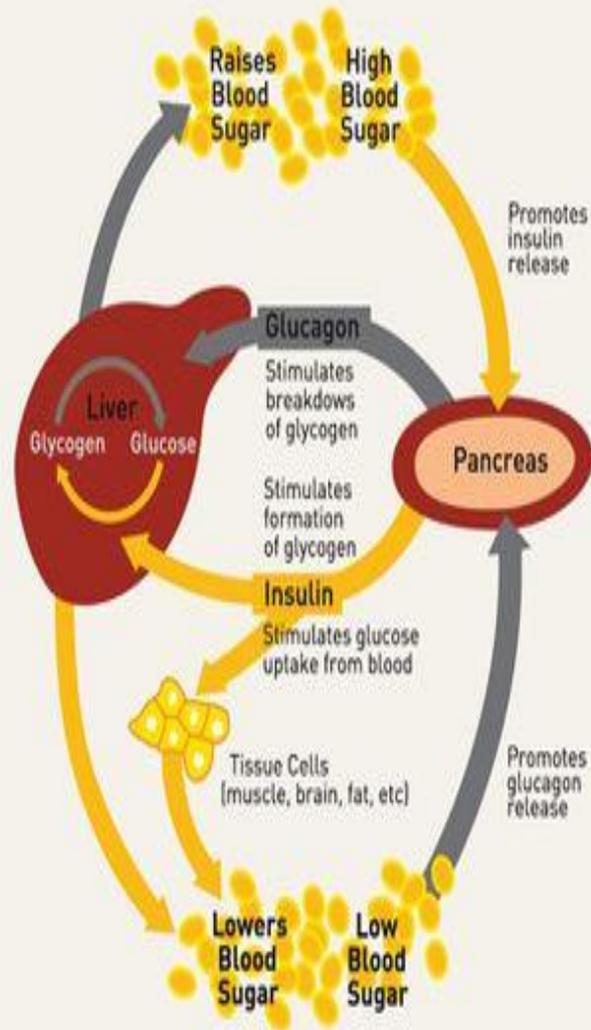
Insulin is a hormone produced by the pancreas that is necessary for cells to be able to use blood glucose. In response to high levels of glucose in the blood, the insulin-producing cells in the pancreas secrete the hormone insulin. Type 1 diabetes occurs when these cells are destroyed by the body's own immune system.

IDF Diabetes Atlas, 4th ed. © International Diabetes Federation, 2009

Fig. (2-9) Insulin production and action (International Diabetes Federation Atlas, 2009).

As a result, diabetes is a long-term illness. Many studies have demonstrated the need for ongoing medical treatment and education to avoid acute problems and lower the likelihood of long-term consequences (Keers *et al*., 2004).

2.6.3. 2. Nutritional Therapy

A one-size-fits-all dietary plan is not obvious for the prevention or treatment of diabetes, and it is an unreasonable expectation given the wide range of persons affected by diabetes and prediabetes, personal preferences, their cultural origins, co-occurring diseases (commonly referred to as comorbidities), and socioeconomic contexts in which they live. Many dietary choices and eating behavior can help people reach their health objectives and improve their quality of life, according to research. Medical nutrition treatment (MNT) is essential in the overall diabetes management strategy, according to the American Diabetes Association (ADA), and the need for MNT should be revisited often by health care professionals in partnership with persons with diabetes throughout their lives, with specific emphasis paid at the time of changing health condition and life cycles (Powers *et al*., 2017).

Members of the medical team may and should give evidence-based assistance to help individuals with diabetes make good food choices that fit their specific requirements and improve their overall health as a supplement to diabetic nutrition treatment. The Dietary Guidelines for Americans (DGA) 2015–2020 establish a foundation for healthy eating for all Americans, recommending that people follow a balanced eating pattern that includes all foods and drinks while staying within a reasonable calorie range (U.S.Department of Health and Human Service, 2019).

RDNs(Domain Name Service) are the preferred member of the health care team for diabetes MNT and leadership in interprofessional

team-based nutritional and diabetic care because of their unique academic preparation, training, abilities, and competence (Franz *et al*., 2017).

When examining diabetes dietary requirements, it is important to keep in mind that the management of type 1 and type 2 diabetes is vastly different. Furthermore, type 2 diabetes, in terms of phenotype and genetics, is not a single illness (Mahajan *et al*., 2018).

Current dietary guidelines for diabetic diet therapy, on the other hand, make no distinction between type I and type II diabetes. Type I diabetes is an autoimmune disease that causes severe or complete insulin secretion defects with no clear dietary cause, whereas type II diabetes is closely linked to several lifestyles and dietary factors that cause overweight and obesity, as well as insulin resistance in the muscle, liver, and adipose tissue (Roden and Shulman, 2019).

As both kinds of diabetes raise the risk of atherosclerotic vascular disease, dietary guidelines for diabetes nutritional treatment stress the use of unsaturated fatty acids rather than saturated, and the Diabetes and Nutrition Study Group (DNSG) for the European Association for the Study of Diabetes (EASD) aims to offer this information (American Diabetes Association, 2019).

The major objective of T2DM Patient prevention is permanent weight loss, which may be achieved by healthy eating habits and increased physical activity. There are currently no long-term preventive trials using a high-protein diet. The findings of the direct study reveal that significant weight loss can lead to remission of recent type 2 diabetes, as well as lower fat content in the liver and pancreas, reiterating the necessity of active treatment of obesity, both in prediabetes and type 2 diabetes, in its early stages (Lean *et al*., 2018).

Personalized diets are becoming more popular, yet current nutritional advice ignores the presumed genetic or phenotypic variability of diabetes. Furthermore, the importance of gut microbiota may change dietary recommendations in the future. Polyunsaturated fatty acids, rather than saturated fatty acids, are what can already be prescribed based on good data, not only for the prevention of atherosclerosis but also for the treatment and prevention of fatty liver disease (Luukkonen, 2018).

Although prevalent in people with T2DM, the reaction may vary depending on their genetic background. Increasing whole grain and dietary fiber consumption for prospective health advantages in terms of gut micro biota and the prevention of non-communicable illnesses makes sense without a doubt, but the response may vary depending on factors such as gut micro biota quality. Individually customized meals for diabetic patients are still distant from clinical practice, according to existing scientific research (Luukkonen *et al*., 2018).

Medical Nutrition Therapy (MNT) is an important part of diabetes prevention, management, and education. To reach treatment goals, the American Diabetes Association (ADA) recommends that it be customized and carried out by a dietician who is experienced with the components of therapy (American Diabetes Association, 2011).

2.7. Strategies for Self-care Nursing Management

Diabetes self-management education is a vital component of diabetes therapy for all patients and is required to enhance patient outcomes (Funnell *et al*., 2009).

Regular exercise may prevent or delay type II diabetes development, Exercise improves blood glucose control in type II diabetes, reduces cardiovascular risk factors, contributes to weight loss, and improves wellbeing. Prolonged sitting should be interrupted. Most

adults with diabetes should engage in 150 min or more of moderate-to-vigorous intensity activity weekly, spread over at least 3 days/week, with no more than 2 consecutive days without activity (American Diabetes Association, 2020).

Flexibility training and balance training are recommended 2–3 times/week for older adults with diabetes. Yoga and tai chi may be included based on individual preferences to increase flexibility, muscular strength, and balance activity (American Diabetes Association, 2020).

Intensive physical activity, adequate food and nutrition, self-management education, health care counseling, and support are all important aspects of diabetic treatment. A rigorous lifestyle intervention might lower the occurrence of T2DM by 58 percent over three years, according to the Diabetes Prevention Program (DPP) (American Diabetes Association, 2017).

Self-care and treatment of diabetes in the early stages contribute to the patient's ability to live a long and healthy life. To intervene and perhaps prevent diabetic problems, essential actions and appropriate management services should be in place. Interventions are viable and cost-effective in situations when there are insufficient means to cover healthcare expenses, whether on a social or personal level. Risk factors can be managed by teaching and advising patients about the need for a balanced diet and physical activity. Diabetes self-management helps to reduce complications and improves the control of major risk factors (WHO. 2016).

In the field of diabetes research, self-management is well structured, with an emphasis on putting in more effort and supporting the maintenance of good glycemic control. The degree of blood glucose control in diabetes mellitus type II is linked to the risk of developing diabetic complications. Glycemic control can be achieved and

maintained in a variety of methods, including patient knowledge of diabetes, behavior toward self-management, self-management skills, and excellent lifestyle choices. Health literacy refers to the traits and assets required to get access to and comprehend the use of information and facilities to make educated health decisions. As a result, inadequate health knowledge is a major contributor to diabetes-related issues (Protheroe *et al.*, 2017).

Self-care refers to the process of learning to take care of oneself as diabetes mellitus progresses and evolves. The majority of diabetes treatment is handled by patients and their families. As a result, trustworthy and effective self-care methods are critical for diabetic self-organization. Smart eating, being physically distinctive, and monitoring glucose levels are fundamental self-care activities for patients who expect fantastic benefits. They also have amazing basic reasoning capabilities, powerful adjusting aptitudes, and risk-reducing practices. These efforts are beneficial to clinicians, educators, and academics that treat diabetes patients and are evaluating innovative treatments. Diabetes self-care necessitates that the patient undertakes lifestyle and nutritional changes, with the assistance of human services specialists, to provide a more grounded dimension of self-assurance, resulting in an effective behavior change (Shrivastava *et al.*, 2013).

Social assistance the family support system, as well as the social support system, is critical in managing diabetes therapy. More might be done if additional family members were counseled about the nature of the sickness and the need for their support for the patients as the condition progressed (Rad et al., 2013).

Education and support for self-management are fundamental when caring for people with a chronic disease like diabetes. Self-management education should be customized and meet the people's needs taking into

account their disease experience, personal characteristics, such as medical history, age, health beliefs and attitudes, diabetes knowledge, health literacy, physical limitations, family support, financial status, and sociocultural factors (Gopalan *et al.,* 2018).

In addition to personal characteristics, the environment that people with DM live in should also be accounted for, such as the physical or social living environment (Mackenbach et al., 2018).

The nurse can play an important role in the initial evaluation of the patients' nutritional habits, monitoring dietary management, and collaborating with dietitians to ensure that the dietary program is continually reinforced (Evert *et al*., 2014).

Education, when delivered in a systematic, organized, and consistent manner, is usually regarded as a key factor in preventing diabetic foot ulcers. The goal is to improve a patient's awareness of foot self-care and self-protective behavior, as well as their motivation and abilities to help them stick to it. People with diabetes, especially those with Guidelines on the prevention and management of diabetic foot disease (IWGDF) risk 1 or higher, should understand how to spot foot ulcers and pre ulcerative indicators, as well as the actions they should take if they experience issues. The instructor should show the patient-specific skills, such as how to properly trim toe nails. Structured education (see examples of instructions below) should be provided by a member of the health care team to individuals or small groups of people in numerous sessions, with frequent reinforcement, and preferably utilizing a variety of approaches. The organized instruction should be culturally relevant, consider gender differences, and be tailored to the patient's health literacy and individual circumstances. To guarantee adequate self-care skills, it is critical to examine if the person with diabetes (and, ideally, any close family member or caretaker) has

received the messages and is motivated to act and follow the instructions. Furthermore, health care providers who give these instructions should be educated regularly to enhance their abilities in caring for persons who are at high risk of developing foot ulcers (Schaper *et al*., 2020).

Nurses are healthcare professionals who are involved in the prevention and early identification of diabetes. Nurses can play a role in health care, community education, health, patient care, health system management, and improving quality of life. Diabetes In the fields of diabetic foot prevention, foot care, and injury prevention, nurses play an essential teaching role. Nurses are in charge of early detection of any changes in skin and foot sensation, as well as foot care, clothing, and the application of current technology in the care dimension. Diabetes nurses aid patients with diabetic foot sores or amputation in regaining mobility in the rehabilitation dimension. As a result, nurses must receive specialized training to use the most up-to-date diabetic foot care instruction and provide quality service to people with diabetes (Aalaa, 2012).

Diabetic foot ulcers are among the most common complications of patients who have diabetes mellitus which is not well controlled. It is usually the result of poor glycemic control, underlying neuropathy, peripheral vascular disease, or poor foot care. It is also one of the common causes of osteomyelitis of the foot and amputation of the lower extremities. These ulcers are usually in the areas of the foot that encounters repetitive trauma and pressure sensations (Singer *et al*. 2017).

Diabetic foot treatment necessitates collaboration amongst professionals. When compared to patients who did not get treatment from a team, the degree of amputation, duration of stay, and death rates

improved in those who did. There might also be an improvement in ulcer healing and overall quality of life (Buggy and Moore, 2017).

Nursing-led patient education (e.g. Lifestyle management, podiatric care, correct exams, and callus management) for diabetic foot care helps to prevent diabetic foot ulcers and lower the amputation rate in high-risk diabetic feet. Intensive education also aids in the reduction of blood pressure, blood glucose, and high-density lipoprotein cholesterol levels (Zhang *et al.*, 2017).

Diabetic foot care is incomplete without proper diabetes management. A group-based self-management education approach, in addition to conventional endocrinology/diabetology care, fasting blood glucose, improves body weight, waist circumference, diabetes knowledge, and triglyceride levels, according to research. These activities can be divided among doctors, nurses, and pharmacists; in any case, the findings and observations must be recorded and communicated to the rest of the team. When compared to peer-led groups, interventions carried out by inter-professional teams with peer supports improved HgA1c (OdgersJewell *et al.*, 2017).

However, there is relatively minimal evidence that patient education as a preventative strategy has a long-term influence (Dorresteijn *et al.,* 2014).

Although dieticians and/or nutritionists are responsible for nutrition instruction, nurses play a significant role. Because of their frequent interaction with diabetic patients, nurses play a critical role in the multidisciplinary team. Nurses are constantly available to patients 24 hours a day in a hospital environment, making them more accessible to patients than other healthcare team members. For example, in the US, nurses are 40 times more than dieticians and 100 times more than trained

diabetes educators to visit diabetes patient's every day on the ward (Bureau of Labor Statistics, 2011).

The primary goal of health promotion is to avoid the occurrence and problems of diabetes. In randomized controlled studies, it has been demonstrated that type II illness can be prevented in a considerable proportion of those at risk. Type II diabetes is prevented or delayed by a combination of lifestyle modifications (weight loss and increased physical exercise) and drugs (particularly metformin) (American Diabetes Association, 2012).

At-risk people must accept responsibility for learning and maintaining changes in lifestyle through counseling, self-management education, and coaching if they are to avoid developing diabetes. For individuals who are not in the high-risk group, blood glucose monitoring at 3-year intervals is advised beginning at the age of 45 (LeMone *et al.*, 2011).

Diabetes self-management education and support (DSMES) services facilitate the knowledge, decision-making, and skills mastery necessary for optimal diabetes self-care and incorporate the needs, goals, and life experiences of the person with diabetes. The overall objectives of DSMES are to support informed decision-making, self-care behavior, problem-solving, and active collaboration with the health care team to improve clinical outcomes, health status, and well-being in a cost-effective manner (Powers *et al.*, 2017).

When offering DSMES, providers are recommended to examine the patient's degree of confidence/self-efficacy for management behaviors, as well as the level of social and familial support. As part of normal clinical treatment, patients' self-management behaviors should be examined, including their influence on health status, clinical outcomes, and quality of life, as well as the psychosocial variables influencing their

capacity to self-manage. A randomized controlled experiment to see if a decision-making education and skill-building program may help people make better decisions (Fitzpatrick *et al*., 2016).

2.8. Previous Studies

A few prior types of research conducted in various nations focused on diabetes mellitus self-care, as follows:

Study No.1

Gabish and Mohammed (2018) conducted research in Baghdad, Al-Rusafa, Iraq, to evaluate the impact of an educational program on enhancing diabetic foot self-efficacy in maintaining patients' feet. Using The Diabetic and Endocrinology Center in Baghdad's Rusafa Sector, the researcher used a descriptive-analytic (quasi-experimental) design. A random sample of (80) female and male diabetes patients was chosen. The researcher assessed the patients' self-efficacy by administering a pre-test, after which a three-lecture education program was delivered. A one-hour talk was delivered. A post-test was conducted Two statistical methodologies were used to examine the data. The post-test found that diabetic foot self-efficacy about foot self-care was 60.0 percent (acceptable), compared to 37.5 percent for the pre-test (weak).

Study No.2

Successful management of diabetes needs a high degree of patient engagement; this may be done by providing diabetic people with the information and skills to execute self-care daily, according to a study conducted by Othman, and Khurshid (2014) in Erbil, Iraq. The goal of this study was to analyze diabetic patients' diabetes knowledge and behaviors in Erbil. From April 2011 to April 2012, cross-sectional research was conducted at Erbil's Shahid Layla Qasim health center for diabetes treatment. A convenience sample of 400 diabetes patients, females, and males, aged 18 years old participated in the study. Data was

collected using a custom-prepared questionnaire that contained socio-demographic characteristics of patients as well as additional questions concerning diabetes awareness and practice. For data input and analysis, SPSS was utilized. Out of 400 research participants, 18 (4.5 percent) had good diabetes knowledge, 209 (52.3percent) had adequate diabetic knowledge, and 137 (43.3 percent) had low diabetes knowledge. Patients' age and knowledge levels were shown to have a statistically significant relationship (P=0.02). Only 51 (12.8 percent) of patients had good practices, while 213 (53.3 percent) had average practices and 136 (33.9 percent) had terrible practices, according to the research. Practice levels were shown to have a statistically significant relationship with the profession (non-manual skilled or semi-skilled); (P-value 0.001), and educational level (institute and higher); (P-value 0.001). The employment and educational level of participants had a substantial impact on the rate of knowledge and practice. Those with a low and acceptable level of diabetes knowledge performed better in practice than those with a high level of diabetes knowledge.

Study No.3

The purpose of a study done by Mokabel *et al*. (2017) in Saudi Arabia was to evaluate the efficiency of diabetic teaching programs for noninsulin-dependent (type II) diabetes mellitus patients and to discover compliance determinants. This study was done in the diabetes outpatient clinic at King Fahd Hospital of the University, Al Khobar, Saudi Arabia, using a longitudinal experimental research methodology. This research comprised a handy sample of 150 adult T2DM. Following the teaching session, patients' body mass index (BMI) decreased significantly, as did their frequent self-checks of blood sugar, dietary regimen, foot care, and exercise and lifestyle behavior. It was discovered that after three exposures to the instructional session, the patients' awareness of diabetes

had improved. After attending the educational session, type 2 diabetes mellitus patients' BMI, sugar buildup, and medication adherence increased significantly, and there was evidence of enhanced awareness of frequent blood sugar self-checks, foot care, dietary regimen, exercise, and lifestyle behavior.

Study No.4

Taha *et al.* (2016) conducted research at Zagazig University Hospital in Egypt. To assess the impact of Type 2 diabetes mellitus health education intervention guidelines on patients' knowledge, self-efficacy, and self-management practices, a study was conducted. 50 patients were examined at pre-intervention, post-intervention, and six-month follow-up in a quasi-experimental uncontrolled manner. The study was conducted at the outpatient clinics of Zagazig University Hospital's Endocrinology and Metabolism. The first tool was a question and answer session to assess socio-demographic data and patients' knowledge, as well as a self-efficacy scale and patients' self-reported self-management behaviors concerning self-care practices. The second tool was a self-efficacy scale and patients' self-reported self-management behavior concerning self-care practices. Patients' knowledge (p.001), self-efficacy (p.001), and self-management (p.001) all improved statistically significantly, and this trend remained through follow-up. Self-management scores were favorably predicted by knowledge and self-efficacy ratings, according to multivariate analysis. The study shows that health educational intervention principles are successful in improving T2DM patients' self-management behaviors and self-care practices by providing good knowledge and developing their self-efficacy. The modest drop in the follow-up phase implies the requirement for booster doses of the intervention regularly. As a result, the study suggests that such instructional guidelines be implemented across all healthcare settings

that provide services to patients with type 2 diabetes. Patients with poor educational attainment, a lengthy history of Type 2 diabetes mellitus, and those living in rural regions should be targeted by such recommendations. More study into the long-term effects of such educational programs is needed**.**

Study No.5

A study which is conducted by Garg *et al*.(2017): in Bengal to assess self-care activities and associated factors among type 2 diabetic patients. A clinic-based cross-sectional study was conducted in Primary Health Centre in Singur among 195 patients (males 45 [23.1%], females 150 [76.9%]) who were interviewed with the help of a pretested schedule. Descriptive statistics, univariate logistic regression, and multivariable logistic regression were used to analyze the data. Results: Among the six domains of self-care activities, drug intake compliance was as high as 72.3% while correct diet intake and foot care were as low as 35.4% and 37.4%, respectively. Overall satisfactory self-care activities were among only 25.6% of diabetic patients while adequate advice related to self-care activities was given to 38.5% of patients. Longer duration (odds ratio [OR] - 3.1, confidence interval [CI] - 1.7-7.4), adequate advised (OR - 2.9, CI - 1.3-6.9), no diabetes distress (OR - 2.9, CI - 1.2-7.4), and glycemic control (OR - 4.0, CI - 1.8-9.3) were significant predictors of satisfactory self-care activities. The final model can predict 34.5% of the variance of self-care activities. The final model can predict 74.4% of the outcome accurately. Both self-care advice and activities should be an integral part of the control of the disease through high-quality health education and promotion programs guided by health personnel at all levels.

Study No.6

Bett, and Sabina Jeruto, (2019) researched to see if a systematic diabetes education strategy for the patient in an urban-rural hospital in Eldoret, Kenya will raise their diabetes knowledge, and self-efficacy, and thereby lower their HbA1c level. A total of 143 men and women were screened and assigned to one of two groups: control or experimental. Both parties agreed to participate. The experimental group received organized diabetes education courses once a week for three weeks, followed by a 3-week follow-up. At the start of the study, all of the participants were given a diabetes knowledge test (DKT) and a self-efficacy exam. The project was completed by 123 out of 143 people (86percent) at the end of the three-month intervention (60 control and 63 experimental). The results indicated that the experimental group's HbA1c levels were considerably lower than the control group's ($F_{(1,122)} = 9.989$, $p=0.002$). In addition, as compared to the control group, the experimental group substantially improved their diabetes knowledge ($t=7.218$, $p=0.001$) and self-efficacy ($F_{(1, 117)} = 14.342$, p0.001). Diabetic education promotes patients' self-efficacy, which is critical in altering lifestyles such as diet intake in treating diabetes. This effort brought attention to the significance of systematic diabetes education for not just patients, but also diabetes management practitioners, caregivers, and the general public.

Study No.7

Hamoudi *et al.* (2012) conducted a cross-sectional study in Nigeria to assess diabetic and non-diabetic Nigerians' knowledge and awareness of DM and to evaluate diabetic patients' awareness of hypoglycemia management, anti-diabetic therapy, and their practical approach to DM control. 340 individuals attended the NNPC-industrial

clinic and Barau Dikko specialty hospital in Kaduna, Nigeria, with 33.7 percent diabetics and 66.2 percent non-diabetic participants. The findings revealed that 78.96percent of all participants have a solid understanding of DM etiology, illness monitoring (70.6percent), management (57.1%), and physical control (52.7 percent). The average level of knowledge of DM clinical manifestations (47.5 percent) and complications was reported (42.4 percent). Risk concerns related to high blood pressure have a low knowledge response (38.3percent). 35 percent of diabetic individuals skipped some anti-diabetes medication doses. 34.2 percent of diabetic participants are unaware of hypoglycemia symptoms, while 53.8 percent unaware of how to treat them. A total of 47.9percent of diabetic individuals did not have their eyes examined, and 30.8 percent did not have their urine tested. Employed individuals in the 40-60 year age group show a strong understanding of Diabetes etiology and complications (P 0.005). Diabetic women are much more informed about how to manage and control their diabetes (P0.005).

Study No.8

Arora et al. (2011) investigated diabetes awareness in mostly Latino patients and families and caregivers in a Los Angeles urban emergency room. The goal of this study was to determine the baseline level of disease-specific knowledge is mostly Latino diabetic patients and their family caregivers at an urban emergency room, as well as to identify variables linked to higher diabetic knowledge. A convenience sample of 291 mostly Latino people in the emergency department who either had diabetes or identified themselves as a caregiver for an immediate family member with diabetes was given the 24-item Diabetes Knowledge Questionnaire (DKQ). Participants with diabetes also supplied details on particular traits that were thought to be linked to their degree of diabetes knowledge. Patients with diabetes scored higher on

the DKQ than their family cares, according to the findings (13.9 vs. 12.3, P,.01). Self-monitoring of blood glucose, longer time since diagnosis, English language preference, and education at the high school level or higher were all linked to higher scores in univariate analysis. Therefore, only the years after diagnosis and schooling acquired statistical significance in multivariate analysis. Diet, organ function, indications of high/low blood sugar, and wound care were the most often skipped questions.

Study No.9

Chiwanga and Njelekela (2015) conducted research in Tanzania to examine diabetes patients' knowledge of foot care and recorded practice of Foot self-care, to identify and eliminate barriers to preventing amputation among people with diabetes. Patients were chosen at random from all of Dar as Salaam's public diabetes clinics. All research participants were given a questionnaire with questions on their knowledge and foot care practices. All patients underwent a thorough foot examination, with the results classified according to the International Diabetes Federation's foot risk categories. SPSS version 14 was used to conduct the statistical analysis. A total of 15 percent of the 404 patients in this research had foot ulcers, 44 percent had peripheral neuropathy, and 15 percent had peripheral vascular disease. Peripheral neuropathy and insulin medication were shown to be substantially linked with the existence of a foot ulcer in multivariate analysis. Out of a potential total of 23, the average knowledge score was 11.2 6.4. Low mean scores were linked to a lack of formal education (8.3 6.1), a 5-year history of diabetes (10.2 6.7), and not obtaining foot care guidance (8.0 6.1). Since their original diagnosis, 48 percent of the 404 patients had gotten foot care guidance, and 27.5 percent had their feet inspected by a doctor at least once. Patients who had gotten foot care instruction and

whose feet had been inspected by a clinician at least once had much better foot self-care. Diabetic foot is quite common among people who visit public clinics in Dar as Salaam. It is critical to develop integrated foot care services inside the diabetes clinic to identify at-risk feet, implement early treatment, and provide ongoing foot care education to patients and healthcare professionals.
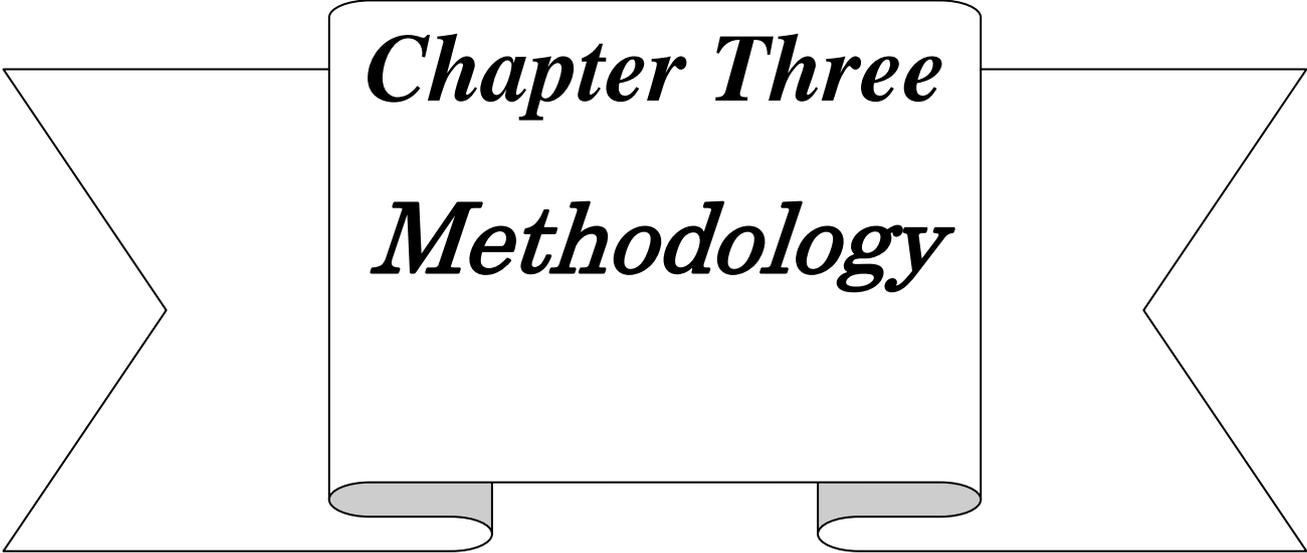
Chapter Three

Methodology

Chapter Three
Methodology

This chapter demonstrates the research design and effectiveness of an oriented educational program on type II diabetic patients' knowledge and self-care practices. This part also includes an administrative arrangement used in the study, the data collection, the validity of the tool, and the empirical reliability study, as well as the analysis of the data.

3.1. Design of the Study

A quiz-experimental study design was used to achieve the study's objectives, with the investing of preliminary and post-test trials for both study and control groups which were initiated for the period from November 27th, 2020 to March 1th 2022. The design was one of the most suitable and effective ways for such an investigation to be conducted.

3.2. Administrative Arrangement

The official permissions were obtained from relevant authorities before collecting the study data as follows:

1. Approval from the committee of Research Ethics at the facility of Nursing of Babylon University (Appendix B-1).

2. Official permissions were also obtained from the Babylon Health Directorate to formally access the Diabetic Center in Hilla City (Appendix B2, B3, B4).

3. The permission is presented to Diabetic Center in Al-Hilla City (Appendix B5).

3.3. Ethical Considerations

The researcher explains and informs patients that their participation was voluntary in the study. The purpose and the benefits of the study were explained by the researcher. After they agreed to participate in the study, and

their adherence to the education program. An anonymous questionnaire was handed to them to maintain complete confidentiality for the participants.

3.4. Setting of the Study

To obtain more specific and premises and accurate data, the study was conducted at the Diabetic Center in Merjan Medical City which is the designated site for data collection. This center was chosen for the following reasons:

1. The center received all adult patients with endocrine problems and diabetes mellitus for treatment and follow-up.

2. It is the only diabetic center in Hilla City.

3. A large number of patients attended this center which facilitates data the process of collection was completed within a limited time.

4. Cooperation of patients in implementing the educational program.

5. Feasibility and accessibility of various physical and educational supplies such as classrooms, stools, tables, projector, computers, and speakers through the duration of the application of the program.

3.5. Study Sample

A non-purposive sampling technique(pre-post sample) was used to select the non-probability of (50) patients who attend the diabetic center at the time of the study period and met the study criteria and had a prior agreement to participate. (10) patients were selected to conduct the sample pilot study and had been excluded from the Ten patients for assessment needs also had been excluded.

(25) patients were selected as a study group and the same number was assigned to be the control group. Some patients from the experimental and non-experimental groups were dropped away from the research because they obtained more than 60% grades (from the experimental group and control group) in the pre-test patients from the study group refused to complete the

post-test. Patients from the control group were dropped out of the study because they as not diagnosed with diabetes mellitus type II.

The total number of patients who attended the diabetic center in Hilla City was purposively selected and classified into two groups; (25) patients in the study group who will be educated in a certain educational program and (25) patients who will not be educated the program, the control group. Both groups have approximately had the same demographic data.
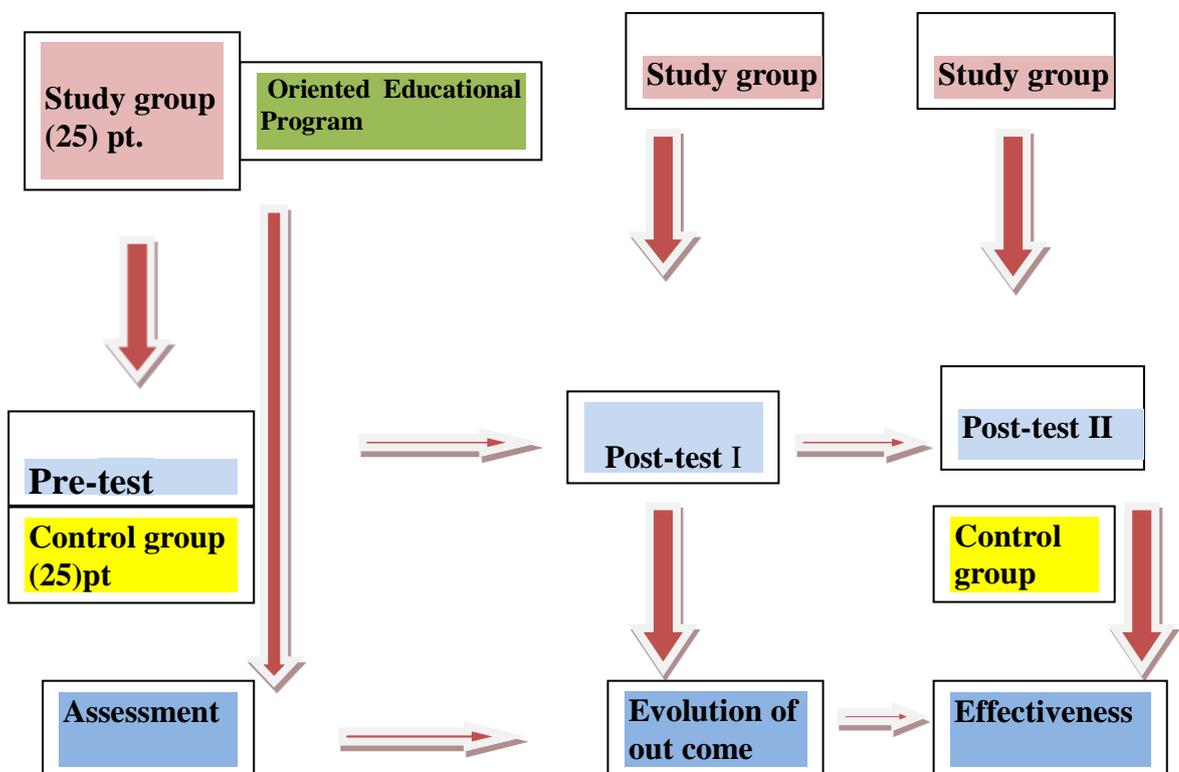
(Figure1) The Schematic Research paradigm of the Study

The process of selection of participants for research according to the following criteria include:

3.5.1. Inclusion Criteria:

1. Patients who were diagnosed with diabetes within the area of the center in Hilla City.

2. Patients who had medical records and are registered in the center.

3. Patients who had scored less than 60% in the pre-test.

4. Patients who were approved to continue in the study.

3.5.2. Exclusion Criteria:

1. Patients who were selected for the pilot study.

2. Patients who do not agree to complete the post-test.

3.6. Data collection

The present study was conducted through the following steps:

3.6.1. Preliminary assessment of patient's knowledge and self-care practices

i.   The main goal of this assessment process was to assess both general knowledge and self-care information practices needs of the patients about diabetes mellitus type II.

ii. To accomplish this phase of the study, the investigator used a Likert Scale questionnaire format. The content of the format was based on the review of related literature and subjective experiences of the knowledge questions.

iii. A test was applied to a sample consisting of (10) patients. As for the assessment of the patients' needs a questionnaire

iv. Each patient was given approximately 15-20 minutes to answer the questions. The results of the assessment revealed that a range (75%) of the patients suffered from a knowledge deficit about self-care. Therefore, the patients need the educational program to enhance and improve their knowledge and self-care toward type II diabetes mellitus.

3.6.2. Construction of the Educational Program

i. The education program design was based on the results of the patient's needs assessment; and information gained from reviewing the relative scientific literature, previous studies, and the researcher's experience. The content of the program is evaluated by experts in different fields. The revision was made to the contents of the program form based on these experts' recommendations and suggestions.

ii. They have agreed that the program was designed efficiently to improve patients toward an educational program for knowledge and self-care about type II diabetes mellitus. The educational program was designed to provide the patients with information development related to disease and its complications, diet, exercise, foot care, and others self-care dealing with type II diabetes mellitus.

iii. The education program was implemented on (25) patients as the study group. The implementation takes (8) lectures to explain and clarify the main domains of the program. Each lecture was designed and scheduled for (2) hours per day. All lectures were presented in the diabetic center in Merjan Medical City.

The program involves eight sessions and was implemented for four weeks in the medical ward. Each session deals with the following:

First session:

Overview of diabetes mellitus and its types.

The following activities and topics were performed:

1. Overview of diabetes mellitus.
2. Types of diabetes mellitus.
3. Signs and symptoms of diabetes mellitus.

   Place of lecture: Classroom for postgraduate studies at the Diabetes Center.

Time of Lecture: :From 10 A.m to 12 p.m.

Second session:

Causes of diabetes mellitus.

The following activities and topics were performed:

1. Type 2 diabetes mellitus is companied by obesity.

2. Type 2 diabetes mellitus non companied by obesity.

3. Low-carb alternatives.

Place of lecture: Classroom for postgraduate studies at the Diabetes Center.

Time of Lecture: :From 10 A.m to 12 p.m.

Third session:

Vegan alternatives.

The following activities and topics were performed:

1. Oral anti-diabetic drugs.

2. Unhealthy lifestyle modifications in patients.

3. Nutritional regulation and the development of healthy food.

Place of lecture: Classroom for postgraduate studies at the Diabetes Center.

Time of Lecture: :From 10 A.m to 12 p.m.

Fourth session:

Nutritional specialty.

The following activities and topics were performed:

1. Types of physical activity.

2. Benefits of physical exercise.

Place of lecture: Classroom for postgraduate studies at the Diabetes Center.

Time of Lecture: :From 10 A.m to 12 p.m.

Fifth session:

Causes.

The following activities and topics were performed:

1. Pharmacological causes.

2. Nutritional reasons.

3. Causes related to physical exertion.

Place of lecture: Classroom for postgraduate studies at the Diabetes Center.

Time of Lecture: From 10 A.m to 12 p.m.

Sixth session:

Diabetic Foot.

The following activities and topics were performed:

1. Overview of diabetic foot.

2. The effect of diabetes on diabetic foot.

3. Loss of feeling.

Place of lecture: Classroom for postgraduate studies at the Diabetes Center.

Time of Lecture: :From 10 A.m to 12 p.m.

Seventh session:

Foot ulcers and weak blood vessels.

Place of lecture: Classroom for postgraduate studies at the Diabetes Center.

Time of Lecture: :From 10 A.m to 12 p.m.

Eight sessions:

Foot care

Place of lecture: Classroom for postgraduate studies at the Diabetes Center.

Time of Lecture: :From 10 A.m to 12 p.m.

3.7. Study Instruments

The Instrument of research was used to appraise the effectiveness of that educational program about general information and self-care toward diabetes mellitus type II, a questionnaire tool was constructed to achieve the objectives of the study, consisting of (2) parts:

Part I: Interview sheet related to demographic characteristics of the patients. This part is a collection of basic demographical data obtained from the patients such as age, gender, education social status, family type, occupation, residents, and economic and clinical data.

Part II: Knowledge about diabetes mellitus questionnaire which is composed of (20) items measured on three-level (know, uncertain, and don't know).

Part III: Self-care about diabetes mellitus questionnaire which is composed of (30) items divided into (4) sections which include:

1. Self-care is related to the diet which is composed of (10) items.
2. Self-care related to exercise is composed of (7) items.
3. Self-care is related to foot care Which is composed of (8) items.
4. Self-care related to other care related to diabetes mellitus is composed of (5) items.

All items of self-care measured on the three-level scale such as (know, uncertain, and don't know).

3.8. Validity of the Questionnaire

Validity is one of the main research concerns. Valid measures help reduce the probability of making type2 errors. The questionnaire was presented to a panel of (11) experts in the area of competence to maintain the validity of the instrument. The experts are from different fields. They include (5) nursing faculty members from College of Nursing, University of Babylon, (3) College of Nursing, University of Kufa, (1) nursing from Ministry of Health, (1) College of Nursing, University of Baghdad, (1)Consultant Director of Diabetes

Center, Babylon Health Department. The experts' notes pointed out the final approval of accrediting the instrument (20 knowledge questionnaire items and 30 self-care questionnaire items) as accurate, precise, concise, and sufficient for the estimation of knowledge. Adaptations and reconstruction are made on a few items based on the experts' suggestions.

3.8. Pilot Study

The pilot study was conducted in a diabetic center in Merjan Medical City for the period from 23/5/2021 to 22/7/2021 to determine the reliability of the study and the testing of the information about patients' knowledge and self-care type II diabetes mellitus. The sample consists of (10) diabetic patients' and some participants were excluded from the original sample of the study.

This preliminary study was done to determine the stability and credibility of the study tool, clarity and efficiency which were confirmed, and the standard time required to collect data for each character which can estimate during the interview procedures, and to difficulties identification that may encounter.

Patients in both groups are exposed to pre-test then only the study group was exposed to the teaching educational program. In the end, both groups are exposed to post-test.

The pilot study took the following consequences:

A. The subject of the study was evaluated regarding the general knowledge and self-care and this was measured in the pre-test.

B. Implementation of the educational program on patients of the study group.

C. Carrying out post-test regarding knowledge and self-care for both groups.

The results of the pilot study pointed out that:

1. The program was clear, concise, precise, and accurate.

2. The requiring time for answering tests both general knowledge and self-care was (15-20) minutes.

Reliability of the Questionnaire:

Reliability testing was conducted on (10) patients using a statistical procedure to determine the concordance among the items of the questionnaire using the reliability coefficient. The scale had an acceptable level of the internal consistency through the Pearson correlation statistical procedure or Alpha Cronbach's as shown below:

Table 3-1: Reliability of the Studied Questionnaire

Variable	Value of Cornbrash's alpha		Actual value	Assessment
	Before	After		
Knowledge 20 items	0.82	0.86	0.70	Accept
Self-care 30 items	0.76	0.81	0.70	Accept

Table (3-1) summarized the reliability process of the instruments. The instrument tool is dependable. The results of the pilot study pointed out that the research tool is passing and reliable to any research in terms of its ability to be applied to the same sample of study at different periods (Wood and Haber, 2014).

3.9. Implementation of Program

The implementation was done in the diabetic center throughout the period from July 25th, 2021 to November 3rd, 2021.

The implementation of the program which was introduced to the study group included the following:

❖ The demographic data form was filled in by each patient in the diabetic center in the study and control group.

❖ To assess the patient's knowledge and self-care, a pre-test was administered to all patients in the study. The pre-test lasted (15-20)

minutes on individual bases. They were then scored and only those who got less than (60%) were included in the study. They were called to attend the same classroom sessions at (10 o'clock) AM to receive the educational program.

❖ Patients' knowledge and self-care test consisted of (50) questions introduced to both study and control groups. The test was constructed to assess the patient's knowledge and self-care on type II diabetes mellitus. The knowledge and self-care test duration lasted from (15-20) munities for each patient. The post-test took the same time as the pre-test.

❖ All patients in this study were exposed to post-tests immediately at the end of the program for the study and control groups.

❖ Regarding the control group, the same above steps were followed except for the educational program.

All kinds of teaching material were used in these meetings. All lectures of the educational program were given in a continuous education program classroom in Diabetic Center.

3.10. Methods of Statistics

The SPSS (Statistical Package of Social Sciences) version 23, and Microsoft Excel (2010) were used invested to analyze the collected data of the study:

3.10.1. Descriptive approach

A. Statistical tables "Frequencies and percent" which are:

$$\% = \frac{Frequency}{Sample\ Size} \, x100$$

B. Mean of scores "M.s.".

The average score can be calculated by using the following:

$$M.S = \frac{\sum ri = 1 Fi \times Si}{\sum ri = 1 Fi} \times 100$$

For Knowledge Questionnaire

$\sum xi$ = sum of the "*1x Don't know + 2x Uncertain + 3 x Know*" for items.

(1) Average (M.s. = 1-1.66) is considered *Poor Knowledge*.

(2) Average (M.s. = 1.67-2.33) is considered *Fair Knowledge*.

(3) Average (M.s.$\geq$ 2.34) is considered *Good Knowledge*.

For Self Care Questionnaire

$\sum xi$ = sum of the "*1x Don't know + 2x Uncertain + 3 x Know*" for items.

(4) Average (M.s. = 1-1.66) is considered *Poor Self Care*.

(5) Average (M.s. = 1.67-2.33) is considered *Fair Self Care*.

(6) Average (M.s.$\geq$ 2.34) is considered *Good Self Care*.

C. The test of standard deviation "S.d.".

$$\text{Standard deviation} = \sqrt{\frac{\sum(X - \bar{X})^2}{n-1}}$$

D. It uses a correlational coefficient "Cronbach alpha" used in estimating the internal consistency of the study tool, which can be calculated by using:

$$\alpha = \frac{K}{K-1}\left[1 - \frac{\sum_{i=1}^{K} \sigma_{ii}}{\sum_{i=1}^{K}\sum_{j=1}^{K} \sigma_{ij}}\right]$$

K is the items number question

σ_{ij} is the investigate covariance between the items

i and j. Note the σ_{ii} is the variance, not the standard deviation of item I

3.10. 2. Inferential Approach

   1. **t-test**

     ❖ **Period t-test**

To assess the significant differences among patients within pre-test and post-test trials in one group, such as the pre-post study group.

     ❖ **Independent t-test**

To calculate the significant difference between two groups of measurement, such as the pre-test of the study group and pre-test of the control group.

   2. **Chi-Squared procedure**

To estimate the differences between the nominal variables of random variables dichotomous as patients' knowledge, awareness, and demographic characteristics.

$$\chi^2 = \frac{\sum_{all\ i}(O_i - E_i)^2}{E_i}$$

Chi-squared= X^2

Sum =$\sum$

Where O_i is the observed frequency of group I

E_i Is the expected frequency.

Shortcuts for measuring importance compared to the level, are used as follows:

   (1) **NS**: *None significantly at probability-value>0.05.*

   (2) **S**: *Significantly at probability-value <0.05.*

   (3) **HS**: *Highly significantly at probability-value <0.01.*
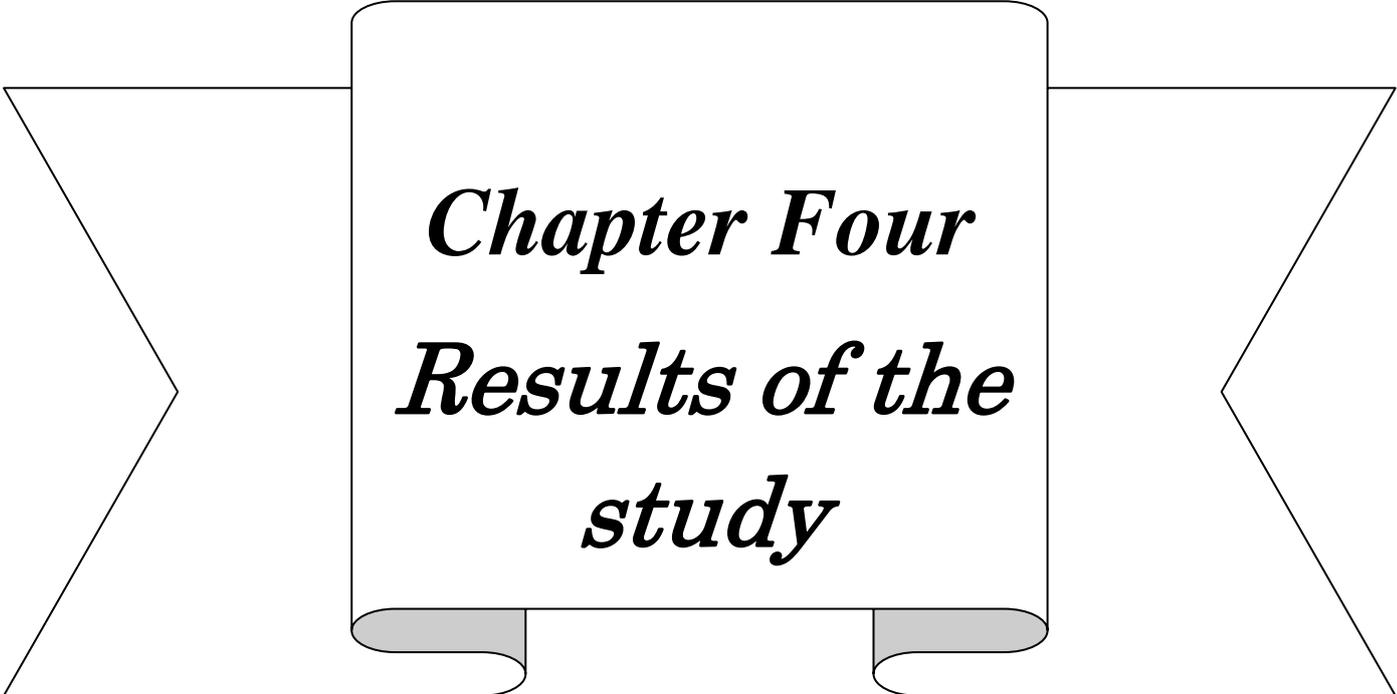
Chapter Four

Results of the study

Chapter Four

Results of the Study

This chapter presents the results of data analysis systematically in tables and consistent with the aims of this study, as in the following:

Table 4-1:Distribution of Sample by Their socio-demographic characteristic in both (Study and Control)

Demographic Data	Groups	Study Group		Control Group	
		Freq.	%	Freq.	%
Age / Years	<20 years	3	12.0	3	12.0
	20-29 years	2	8.0	1	4.0
	30-39 years	3	12.0	2	8.0
	40-49 years	2	8.0	1	4.0
	50-59 years	6	24.0	8	32.0
	60 and older	9	36.0	10	40.0
	Total	25	100.0	25	100.0
	Mean± SD	44.44±16.571		52.20±17.769	
Gender	Male	9	36.0	11	44.0
	Female	16	64.0	14	56.0
	Total	25	100.0	25	100.0
Education level	Read and write	11	44.0	13	52.0
	Primary School Graduate	6	24.0	9	36.0
	Secondary School Graduate	5	20.0	2	8.0
	Institute and above	3	12.0	1	4.0
	Total	25	100.0	25	100.0
Marital Status	Single	2	8.0	4	16.0
	Married	20	80.0	16	64.0
	Divorced	3	12.0	5	20.0
	Total	25	100.0	25	100.0
Family type	Nuclear	22	88.0	18	72.0
	Extend	3	12.0	7	28.0
	Total	25	100.0	25	100.0
Occupation	Employee	9	36.0	8	32.0
	unemployed	3	12.0	7	28.0

	Retired	5	20.0	4	16.0
	House wife	8	32.0	6	24.0
	Total	25	100.0	25	100.0
Residents	Urban	18	72.0	13	52.0
	Rural	7	28.0	12	48.0
	Total	25	100.0	25	100.0
Economic	Enough	2	8.0	2	8.0
	Enough to some extent	6	24.0	10	40.0
	Not enough	17	68.0	13	52.0
	Total	25	100.0	25	100.0
BMI	Underweight (<18.5)	0	0.0	5	20.0
	Normal (18.5-24.9)	8	32.0	6	24.0
	Overweight (25-29.9)	17	68.0	14	56.0
	Total	25	100.0	25	100.0
Smoking status	Non	13	52.0	17	68.0
	EX-smoker	5	20.0	3	12.0
	Smoker	6	24.0	4	16.0
	Passive Smoker	1	4.0	1	4.0
	Total	25	100.0	25	100.0
History of food allergy	Yes	2	8.0	5	20.0
	No	23	92.0	20	80.0
	Total	25	100.0	25	100.0
Family history of DM	Yes	19	76.0	16	64.0
	No	6	24.0	9	36.0
	Total	25	100.0	25	100.0
Duration of disease	<1 year	2	8.0	4	16.0
	1-5 years	3	12.0	4	16.0
	>5 years	20	80.0	17	68.0
	Total	25	100.0	25	100.0

(Freq.): Frequency, (%): percentage, (SD) : Standard Deviation

This table represents the distribution of the study participants' demographic characteristics in terms of frequencies and percentage (control versus study). The diabetic patient's ages show that the majority of the study and control group sample ranged from 60 and older. Results related to gender showed that females predominated in both the study and control group, accounting for 64% and 56% of the total, respectively. Concerning education, the distribution of findings in the study and control group was reading and writing (44%, 52%) respectively. In

terms of marital status, both study-control groups were married and constituted (80% and 64%) respectively from nuclear families. Majority of participants in the study and control group were employed, constituting (36% and 32%) respectively. Both groups study and control residents in urban areas and make not have enough income or funds. Majority of patients in both groups with overweight body mass index (68% and 56%, respectively) and non-smoking study (52%) and control group (68%) without a history of food allergy study (92%) and control group (80%). Patients who participated in the current study had a family history of D.M. for both study and control groups (76% and 64% respectively). Regarding the duration of disease, they had more than one year as a duration of diabetes mellitus for the study group (80%) and the control group (68%).

Table 4-2: Responses of the (Study Group) Patients' at Pre-test Regarding the Knowledge of Type II Diabetes Mellitus

	Knowledge Items	Pre-test Study Group		
		M.s.	SD	Ass.
1	Diabetes is a serious disease	2.00	0.913	Fair
2	Diabetes can be cured	1.36	0.569	Fail
3	diabetes is the lack of effective insulin in the body	1.24	0.436	Fail
4	Diabetes is a hereditary disease	1.24	0.523	Fail
5	Diabetes means that glucose(blood sugar)is too high	1.24	0.523	Fail
6	Panaceas produce insulin	1.16	0.374	Fail
7	A fasting blood sugar level is about (80-120)	1.16	0.374	Fail
8	Type II is non-insulin dependent	1.08	0.277	Fail
9	Shaking is a sign of high blood sugar	1.16	0.374	Fail
10	Confusion is a sign of high blood sugar	1.20	0.500	Fail

11	Sweating is a sign of high blood sugar	1.16	0.473	Fail
12	behavioral change is a sign of high blood sugar	1.24	0.597	Fail
13	Frequent urination and thirst are signs of low blood sugar	1.12	0.332	Fail
14	Diabetes can damage kidneys	1.20	0.408	Fail
15	Diabetes can damage eyes	1.16	0.473	Fail
16	Diabetes can affect the sexual function	1.20	0.500	Fail
17	Diabetes can cause weight changes	1.24	0.523	Fail
18	It is good to feel well as general	1.12	0.440	Fail
19	blood sugar cause worry to individual	1.20	0.500	Fail
20	Diabetes often causes poor circulation	1.12	0.332	Fail

Cut off points value (M.s. =0.66) Poor, (M.s.=1-1.66) Fair, (M.s.=1.67-2.33) good

The findings demonstrated assessment of the study sample responses in the pre-test for the study group. The study results indicate that the study group at the pre-test is poor in all studied items (M.s.=1-1.66) except, the items number (1) the responses were fair knowledge (M.s.=1.67-2.33).

Table 4-3:Overall Assessment of the Study Sample knowledge level Responses at the Pre-test for Study Group

Overall Assessment of Study Group	Pre-test Study Group			
	Freq.	%	Overall M.s.	Ass.
Poor	24	96.0		
Fair	1	4.0	1.23	Poor Knowledge
Good	0	0.0		
Total	25	100.0		

"(M.s) mean of score (0.66) Poor, (M.s.=1-1.66) Fair, (M.s.=1.67-2.33) Good (M.s.≥2.34)"

Findings show that the majority of the study group responses at the pre-test are Poor knowledge with a statistical mean of score equal to (M.s =1.23).
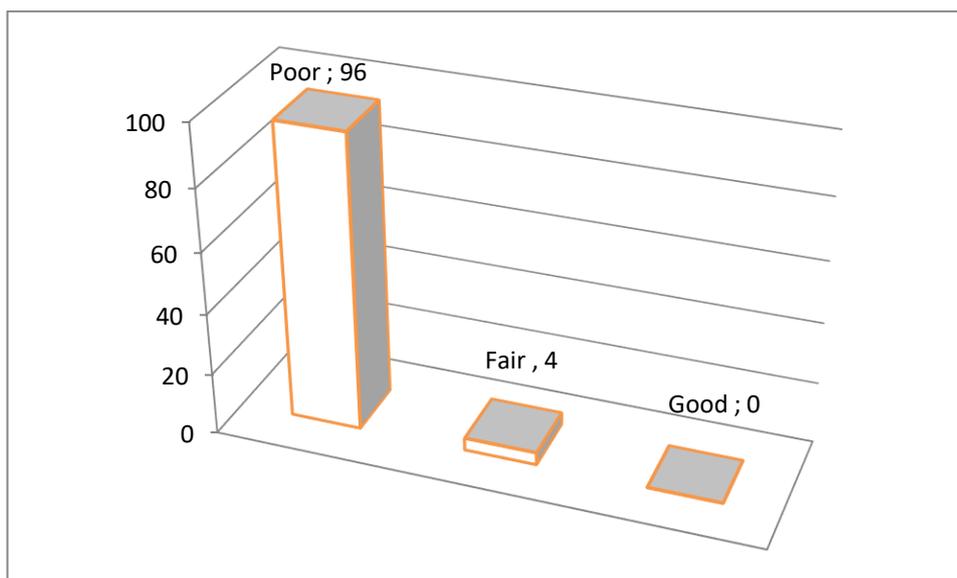
Figure 4-1: Diabetic Patient's Knowledge Responses at the Pre-test

Table 4-4: Responses of Study Group Patients at Post-test 1 Regarding Knowledge of Type II Diabetic

	Knowledge Items	Post-test 1 Study Group		
1	Diabetes is a serious disease	2.84	0.473	Good
2	Diabetes can be cured	2.80	0.500	Good
3	diabetes is the lack of effective insulin in the body	2.76	0.597	Good
4	Diabetes is hereditary disease	2.80	0.500	Good
5	Diabetes means that glucose is too high	2.80	0.500	Good
6	Panaceas produce insulin	2.80	0.500	Good
7	A fasting blood sugar level is about (80-120)	2.64	0.700	Good
8	Type II is non-insulin dependent	2.72	0.614	Good
9	Shaking is a sign of high blood sugar	2.60	0.707	Good
10	Confusion is a sign of high blood sugar	2.64	0.638	Good
11	Sweating is a sign of high blood sugar	2.64	0.757	Good

12	behavioral change is a sign of high blood sugar	2.60	0.764	Good
13	Frequent urination and thirst are signs of low blood sugar	2.68	0.690	Good
14	Diabetes can damage kidneys	2.68	0.690	Good
15	Diabetes can damage eyes	2.64	0.638	Good
16	Diabetes can affect the sexual function	2.76	0.597	Good
17	Diabetes can cause weight changes	2.72	0.678	Good
18	It is good to feel well as general	2.68	0.690	Good
19	blood sugar cause worry to individual	2.72	0.678	Good
20	Diabetes often causes poor circulation	2.80	0.577	Good

"(M.s) mean of score (0.66) Poor, (M.s.=1-1.66) Fair, (M.s.=1.67-2.33) Goo(M.s.≥2.34)"

The findings of this table demonstrated the assessment of the study sample knowledge level responses at the post-test for the study group. The study results indicate that the study group at the post-test has good at all studied items (M.s.≥2.34).

Table 4-5: Overall Assessment of the Study Sample Knowledge Responses level at the Post-test(1) for Study Group

Overall Assessment of Study Group	Post-test 1 Study Group			
	Freq.	%	Overall M.s.	Ass.
Poor	0	0.0		
Fair	2	8.0	2.71	Good Knowledge
Good	23	92.0		
Total	25	100.0		

"(M.s) mean of score (0.66) Poor, (M.s.=1-1.66) Fair, (M.s.=1.67-2.33) Good (M.s.≥2.34)"

Findings show that the majority of the study group responses at the post-test are Good knowledge with a statistical mean of score equal to (M.s.=2.71).
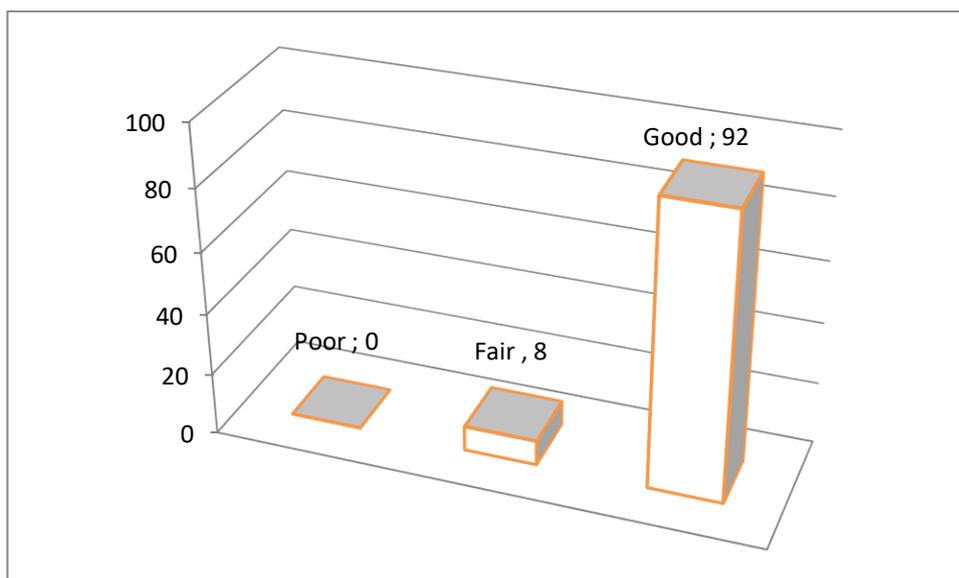
Figure 4-2: Diabetic Patient's Knowledge Responses at the Post-test 1

Table 4-6:Differences distribution of the Study Group by their overall responses with Significant Difference between Pre-test and Post-test Scores

Tested paired	Periods of Measurement	Mean of Score	N	Std. Deviation	t-value	d.f.	p-value
Study group overall responses	Pre-test	1.23	25	0.200	28.342	24	0.000 HS
	Post-test	2.71	25	0.277			

(M.s) mean of score , (S.d), (Ns): Non-significant (S): significant , (t- value): t-test, (D f): "degree of freedom"

Findings demonstrated that there a high-significant difference between the study group's overall responses in two periods of measurements (pre-test and post-test) at a p-value less than 0.000, for the statistical mean of the score, the study results indicate that there is an improvement in the patient's knowledge at the post-test compared with pre-test scores.

Figure 4-3:Comparison between the Overall Study Group Responses at two levels of measurement (pre-test and post-test)

Table 4-7: Responses of Study Group Patients at Post-test 2 Regarding Knowledge of Type II Diabetes Mellitus

	Knowledge Items	Post-test 2 Study Group		
1	Diabetes is a serious disease	2.68	0.690	Good
2	Diabetes can be cured	2.68	0.690	Good
3	diabetes is the lack of effective insulin in the body	2.72	0.678	Good
4	Diabetes is hereditary disease	2.64	0.700	Good
5	Diabetes means that glucose(blood sugar)is too high	2.76	0.597	Good
6	Panaceas produce insulin	2.72	0.614	Good
7	A fasting blood sugar level is about (80-120)	2.48	0.823	Good
8	Type II is non-insulin dependent	2.56	0.768	Good
9	Shaking is a sign of high blood sugar	2.60	0.707	Good

10	Confusion is a sign of high blood sugar	2.56	0.712	Good
11	Sweating is a sign of high blood sugar	2.56	0.821	Good
12	behavioral change is a sign of high blood sugar	2.52	0.823	Good
13	Frequent urination and thirst are signs of low blood sugar	2.60	0.764	Good
14	Diabetes can damage kidneys	2.60	0.764	Good
15	Diabetes can damage eyes	2.56	0.712	Good
16	Diabetes can affect the sexual function	2.68	0.690	Good
17	Diabetes can cause weight changes	2.64	0.700	Good
18	It is good to feel well as general	2.68	0.690	Good
19	blood sugar cause worry to individual	2.60	0.764	Good
20	Diabetes often causes poor circulation	2.72	0.678	Good

"Cut of point (0.66), (M.s) mean of score (0.66) Poor, (M.s.=1-1.66) Fair, (M.s.=1.67-2.33), and Good (M.s.≥2.34)"

Findings demonstrated assessment of the study sample knowledge degree responses at the post-test two for the study group. The study results indicate that the study group at the post-test is good at all studied items (M.s.≥2.34).

Table 4-8: Overall Assessment of the Study Sample Responses at the Post-test 2 for Study Group

Overall Assessment of Study Group	Post-test 2 Study Group			
	Freq.	%	Overall M.s.	Ass.
Poor Knowledge	0	0.0	2.62	Good Knowledge
Fair Knowledge	3	12.0		
Good Knowledge	22	88.0		
Total	25	100.0		

"Cut of point (0.66), (M.s) mean of score (0.66) Poor, (M.s.=1-1.66) Fair, (M.s.=1.67-2.33) and Good (M.s.≥2.34)"

Findings reveal that the majority of the study group responses at the post-test two had pass knowledge with a statistical mean score equal to (2.62).
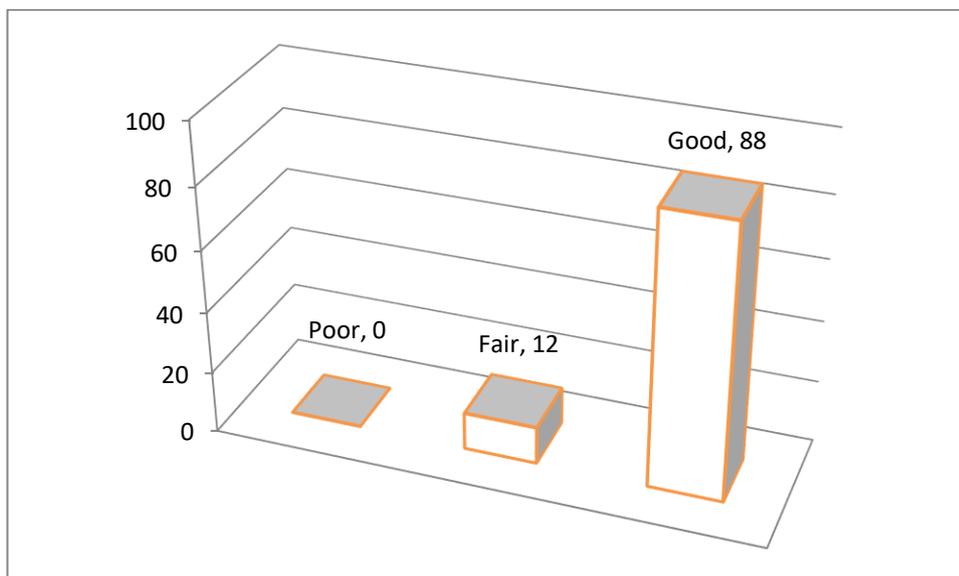
Figure 4-4: Diabetic Patient's Knowledge Responses at the Post-test 2

Table 4-9: Statistical distribution of the Study Group by their overall responses with Significant Difference between Post-test(1) and Post-test (2) Scores

Tested paired	Periods of Measurement	Mean of Score	N	Std. Deviation	t-value	d.f.	p-value
Study group overall responses	**Post-test 1**	**2.71**	**25**	**0.277**	**1.000**	**24**	**0.327 NS**
	Post-test 2	**2.62**	**25**	**0.332**			

"(Ns): Non-significant (S): significant , (t- value): t-test, (D f): degree of freedom"

Findings demonstrated that there was no significant difference between the study group's overall responses in two periods of measurements (post-test one and post-test two) at a p-value of more than 0.05, for the statistical mean of the score, the study results indicate that the knowledge level remains same even if time passes.
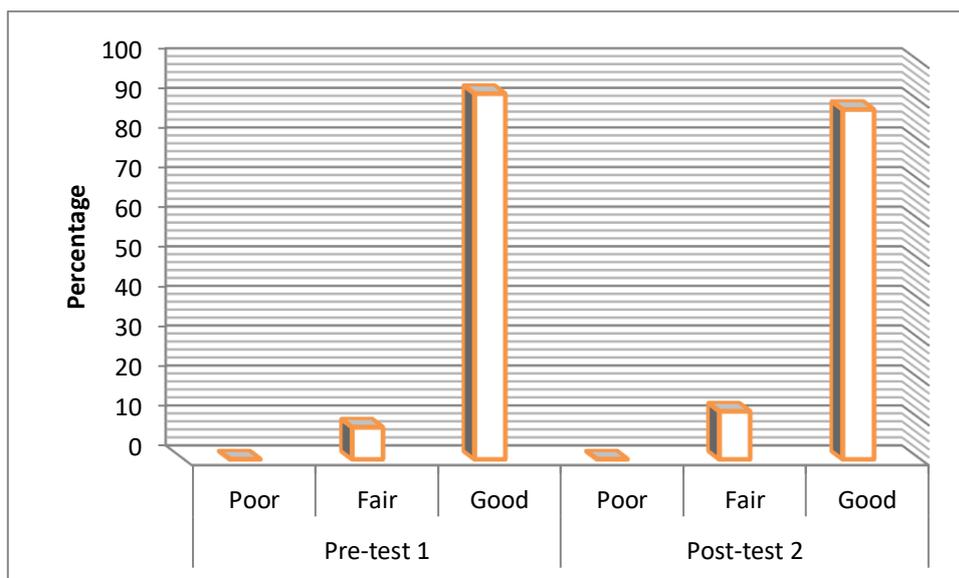
Figure 4-5: Comparison between the overall study group responses at two levels of measurement (Post-test one and post-test two)

Table 4-10: Responses of Control Group Patients 'at Pre-test Regarding Knowledge of Type II Diabetes Mellitus

	Knowledge Items	Pre-test Control Group		
		M.s.	SD	Ass.
1	Diabetes is a serious disease	2.00	0.913	Fair
2	Diabetes can be cured	1.36	0.638	Poor
3	diabetes is the lack of insulin in the body	1.32	0.627	Poor
4	Diabetes is hereditary disease	1.20	0.500	Poor
5	Diabetes means that glucose is too high	1.20	0.577	Poor
6	Panaceas produce insulin	1.28	0.614	Poor
7	A fasting blood sugar level is about (80-120)	1.24	0.523	Poor
8	Type II is non-insulin dependent	1.24	0.597	Poor
9	Shaking is a sign of high blood sugar	1.28	0.614	Poor
10	Confusion is a sign of high blood sugar	1.20	0.500	Poor

11	Sweating is a sign of high blood sugar	1.20	0.500	Poor
12	behavioral change is a sign of high blood sugar	1.20	0.500	Poor
13	Frequent urination and thirst are signs of low blood sugar	1.24	0.597	Poor
14	Diabetes can damage kidneys	1.36	0.638	Poor
15	Diabetes can damage eyes	1.28	0.614	Poor
16	Diabetes can affect the sexual function	1.24	0.597	Poor
17	Diabetes can cause weight changes	1.28	0.614	Poor
18	It is good to feel well as general	1.08	0.277	Poor
19	blood sugar cause worry to individual	1.08	0.277	Poor
20	Diabetes often causes poor circulation	1.04	0.200	Poor

"Cut of point (0.66), (M.s) mean of score (0.66) Poor, (M.s.=1-1.66) Fair, (M.s.=1.67-2.33), and Good (M.s.≥2.34)"

Findings illustrated the assessment of the study sample's level of knowledge at the pre-test for the control group. The study results indicated that the control group at the pre-test accounted for the poor level in all studied items (M.s.= 1-1.66) except, for the first item the responses were fair knowledge (M.s.=1.67-2.33).

Table 4-11: Overall Assessment of Knowledge of Control Group of Participants at the Pre-test.

Overall Assessment for Control Group	Pre-test Control Group			
	Freq.	%	Overall M.s.	Ass.
Poor Knowledge	23	92.0		
Fair Knowledge	1	4.0		Fail Knowledge
Good Knowledge	1	4.0	1.26	
Total	25	100.0		

"Cut of point (0.66), (M.s) mean of score (0.66) Poor, (M.s.=1-1.66) Fair, (M.s.=1.67-2.33), and Good (M.s.≥2.34)"

Findings showed that the majority of the control group responses at the pre-test ahad failed knowledge with a statistical mean of score equal to 1.26.
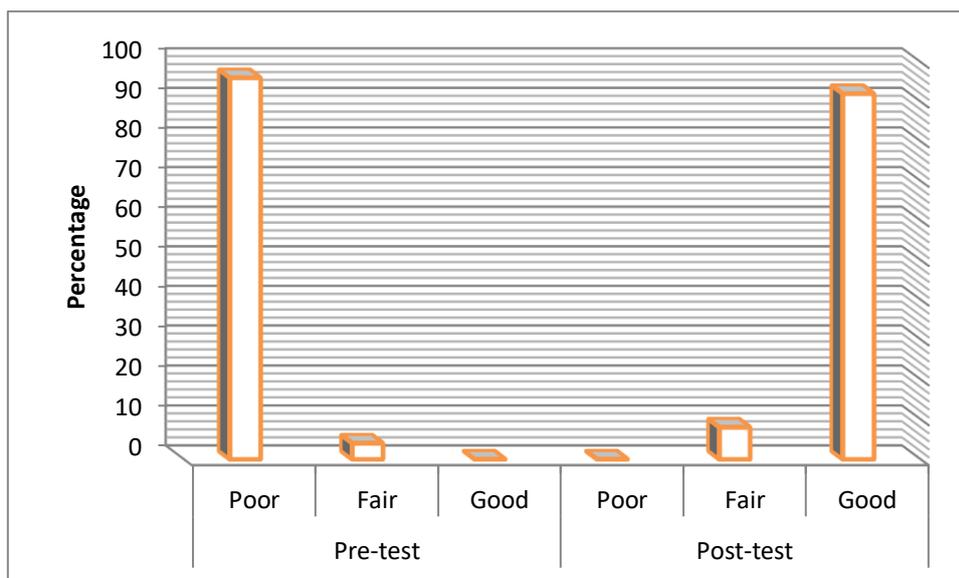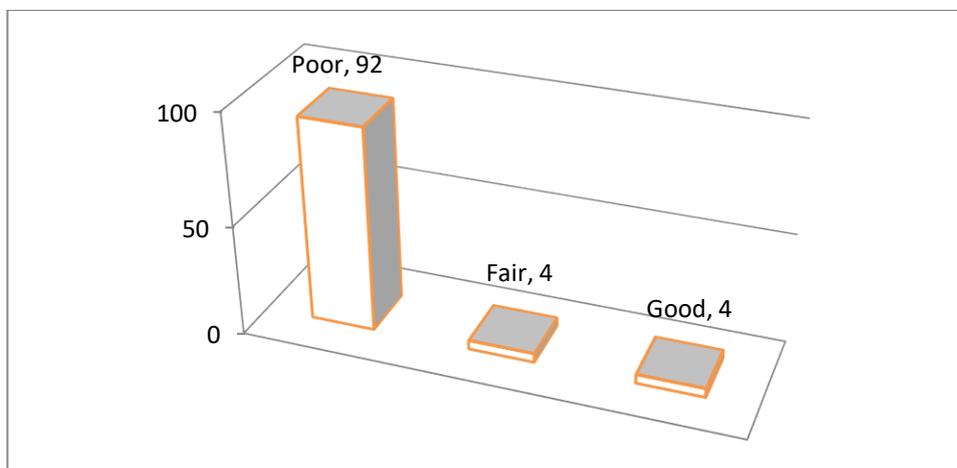

Figure 4-6:Diabetic Patients' Knowledge Responses at the Pre-test

Table 4-12: Responses of Control Group Patients at Post-test Regarding the Knowledge of Type II Diabetes Mellitus

	Knowledge Items	Post-test Control Group		
		M.s.	SD	Ass.
1	Diabetes is a serious disease	1.84	0.850	Fair
2	Diabetes can be cured	1.36	0.638	Poor
3	diabetes is the lack of effective insulin in the body	1.36	0.638	Poor
4	Diabetes is hereditary disease	1.16	0.473	Poor
5	Diabetes means that glucose(blood sugar)is too high	1.20	0.500	Poor
6	Panaceas produce insulin	1.24	0523	Poor
7	A fasting blood sugar level is about (80-120)	1.20	0.500	Poor
8	Type II is non-insulin dependent	1.32	0.627	Poor

9	Shaking is a sign of high blood sugar	1.36	0.700	Poor
10	Confusion is a sign of high blood sugar	1.24	0.523	Poor
11	Sweating is a sign of high blood sugar	1.24	0.523	Poor
12	behavioral change is a sign of high blood sugar	1.24	0.523	Poor
13	Frequent urination and thirst are signs of low blood sugar	1.40	0.707	Poor
14	Diabetes can damage kidneys	1.20	0.408	Poor
15	Diabetes can damage eyes	1.28	0.614	Poor
16	Diabetes can affect the sexual function	1.20	0.500	Poor
17	Diabetes can cause weight changes	1.36	0.700	Poor
18	It is good to feel well as general	1.12	0.332	Poor
19	blood sugar cause worry to individual	1.16	0.374	Poor
20	Diabetes often causes poor circulation	1.12	0.332	Poor

"Cut of point (0.66), (M.s) mean of score (0.66) Poor, (M.s.=1-1.66) Fair, (M.s.=1.67-2.33), and Good (M.s.≥2.34)"

Table(4-12) reveal that the knowledge assessment level of the control group was poor at post-test at all items and represented (M.s. 1-1.66) except item (No. 1) the response was fair at (M.s. 1.67- 2.33).

Table 4-13: Overall assessment of the study Sample responses at the post-test for the control group

Overall Assessment for Control Group	Post-test Control Group			
	Freq.	%	Overall M.s.	Ass.
Poor Knowledge	22	88.0	1.28	Poor Knowledge
Fair Knowledge	2	8.0		
Good Knowledge	1	4.0		
Total	25	100.0		

"Cut of point (0.66), (M.s) mean of score (0.66) Poor, (M.s.=1-1.66) Fair, (M.s.=1.67-2.33), and Good (M.s.≥2.34)"

Table 4-13 shows that the majority of the control group responses at the post-test are poor knowledge with a statistical mean score equal to (1.28).


Poor, 88

Fair, 8

Good, 4
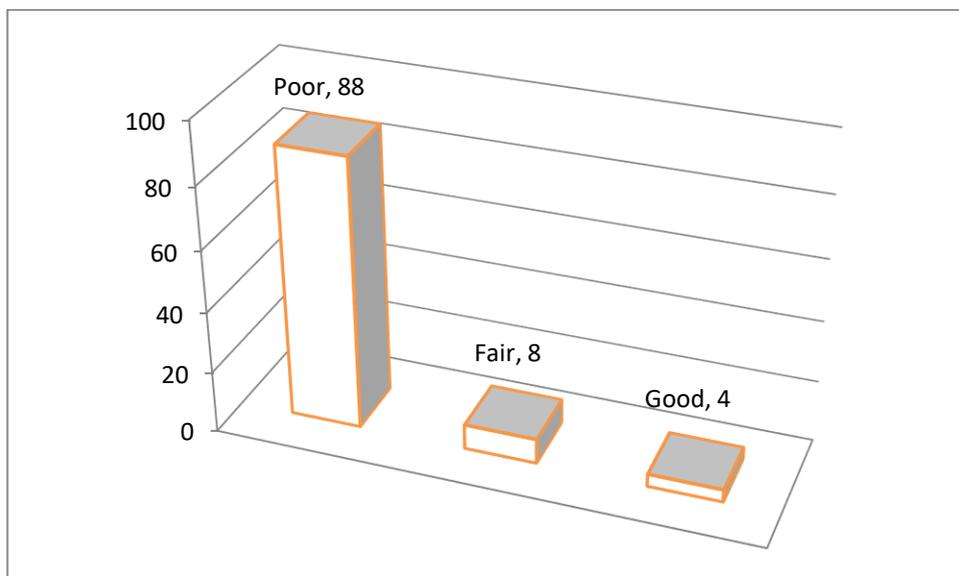
Figure 4-7: Diabetic Patient's Knowledge Responses at the Post-test

Table 4-14: Statistical distribution of the Control Group by their overall responses with significant difference between pre-test and post-test scores

Tested paired	Periods of Measurement	Mean of Score	N	Std. Deviation	t-value	d.f.	p-value
Control group overall responses	Pre-test	1.26	25	0.440	0.327	24	0.746 NS
	Post-test	1.28	25	0.473			

"(Ns): Non-significant (S): significant, (t- value): t-test, (D f): degree of freedom"

Findings illustrated that there are a no-significant difference between the control group's overall responses in two periods of measurements (pre-test and post-test) at a p-value of more than 0.05, for the T-test value mean, the study results indicate that there is a no improvement in the patient's knowledge at the post-test compared with pre-test scores.
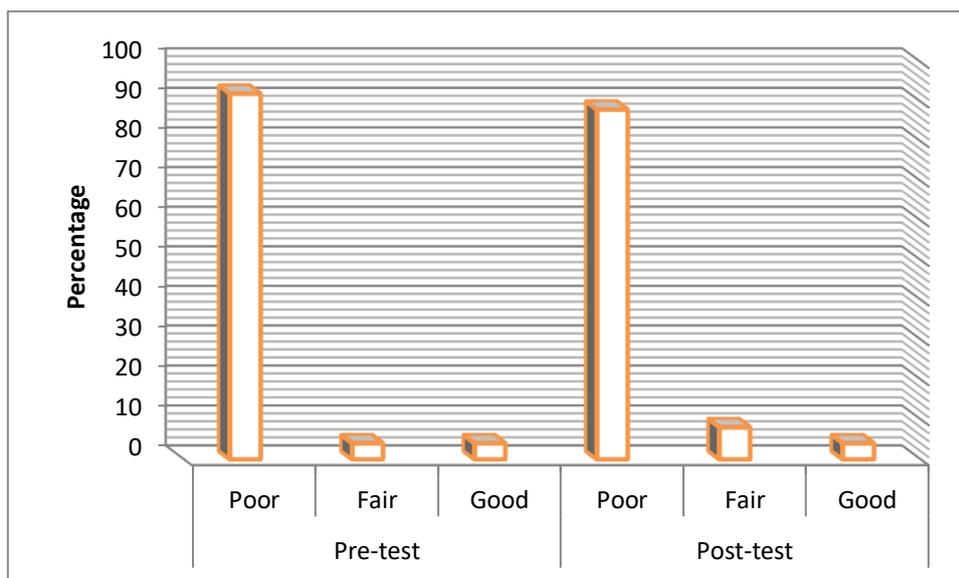
Figure 4-8:Comparison between the overall control group knowledge responses at two levels of measurement (pre-test and post-test)

Table 4-15: Mean Difference (Independent sample t-test) between the Study and Control Group responses at pre-test and post-test 1

Periods of measurements	Groups	N	Mean	Std. Deviation	t-value	d.f.	p-value
Pre-test	Study	25	1.23	0.200	0.828	48	0.412 NS
	Control	25	1.26	0.440			
Post-test	Study	25	2.71	0.277	16.067	48	0.000 HS
	Control	25	1.28	0.473			

The results of this table demonstration that there was a non-significant difference between the study and control groups in the pre-test at a p-value of more than 0.05, while there was a highly significant difference between the study and control groups in the post-test 1 with a p-value less than 0.01. For the t-test procedure, the study results indicated that there i was s an improvement in the knowledge level of the study group responses after the application of the program compared with the control group.
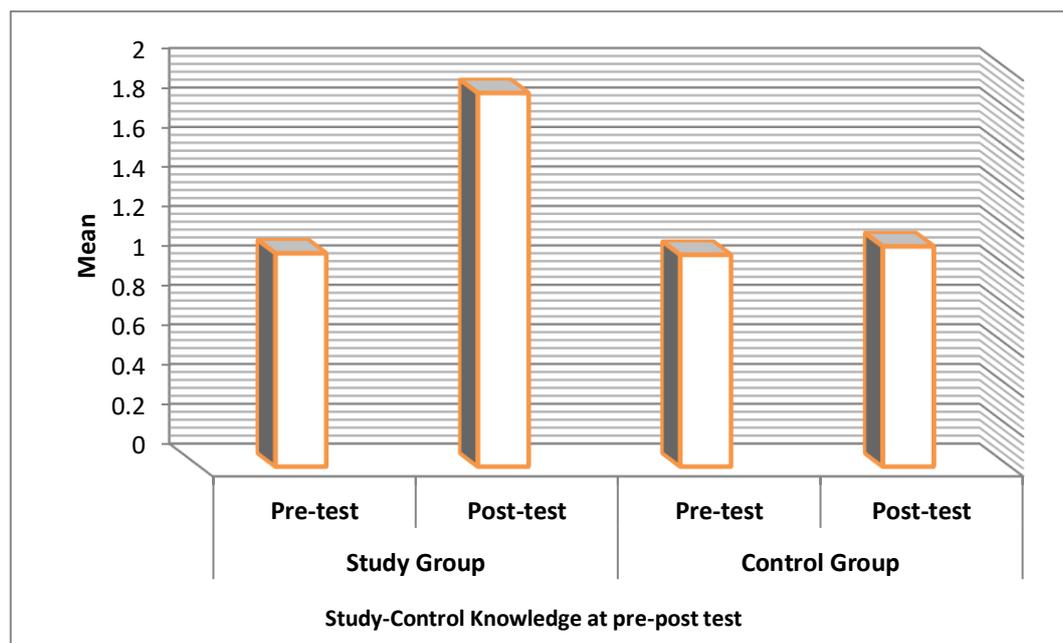
Figure 4-9:Comparison between the Overall Study and Control Groups' responses at two levels of measurement (pre-test and post-test)

Table 4-16: Patients' Responses of the study group at pre-test about self-care

	self-care Items	Pre-test Study Group		
		M.s.	SD	Ass.
1	Eat from 175-250 grams of carbohydrate (including mostly, bread and rice /per day	1.20	0.408	Poor
2	I take at least one potato meal daily	1.16	0.374	Poor
3	Unsweetened fruit juice is appropriate for the condition	1.24	0.523	Poor
4	My diet should be less fatty	1.16	0.374	Poor
5	My diet includes fiber vegetables and fruits like apple	1.24	0.523	Poor
6	Meals must be small and multiple(5)meal	1.16	0.473	Poor
7	Taking any over counter medication	1.24	0.523	Poor
8	Taking any over counter vitamins ,or supplements	1.20	0.500	Poor
9	It is important to read and use food labels as a dietary guide	1.24	0.597	Poor
10	Taking diabetes medications. Diabetes pills	1.12	0.332	Poor
11	Bicycling (including stationary exercise bike)10 mint	1.28	0.614	Poor

12	Engaging in carrying or lifting heavy loads digging or constructing work for (10) mint	1.12	0.332	Poor
13	Engaging in physical activities like traveling and shopping	1.28	0.614	Poor
14	Engaging in other sports and fitness (leisure) for 10 mints	1.20	0.500	Poor
15	Performing sports and fatness as walk and swimming	1.12	0332	Poor
16	Reducing driving	1.24	0.597	Poor
17	Reducing lift using	1.36	0.638	Poor
18	Wash the feet every day	1.28	0.614	Poor
19	Drying up between toes	1.28	0.542	Poor
20	Using moistening cream on feet	1.40	0.707	Poor
21	I reach and see the bottoms of my feet	1.20	0.500	Poor
22	Always test the water temperature before putting the foot in it	1.24	0.523	Poor
23	It is important to clean a cut with iodine and alcohol	1.24	0.523	Poor
24	Diabetics take extra care when cutting their toenails.	1.24	0.597	Poor
25	Tight elastic shoes or socks are bad for diabetics.	1.20	0.500	Poor
26	Blood sugar must be cheek early morning before breakfast	1.28	0.614	Poor
27	A glucose meter must be available at home	1.28	0.614	Poor
28	Medication is more important than diet.	1.36	0.700	Poor
29	Medication important than exercise to control my diabetes.	1.32	0.627	Poor
30	Keep on appointments and visit the health care facility for follow-up and exposure to health education	1.40	0.764	Poor

"Cut of point (0.66), (M.s) mean of score (0.66) Poor, (M.s.=1-1.66) Fair,

**(M.s.=1.67-2.33), and Good (M.s.≥2.34)"**

This table demonstrated the assessment of the study sample's self-care responses at the pre-test for the study group. The study results indicated that the study group at the pre-test is poor in all studied items (M.s.= 1-1.66).

Table 4-17: Overall assessment of the study sample responses at the pre-test for the study group for self-care

Overall Assessment of Study Group	Pre-test Study Group			
	Freq.	%	Overall M.s.	Ass.
Good Self-care	1	4.0	1.24	Poor Self Care
Moderate Self Care	3	12.0		
Poor Self Care	21	84.0		
Total	25	100.0		

"Cut of point (0.66), (M.s) mean of score (0.66) Poor, (M.s.=1-1.66) Fair, (M.s.=1.67-2.33), and Good (M.s.≥2.34)"

Findings show that the majority of the study group responses at the pre-test had poor self-care with a statistical mean score equal to (1.24).
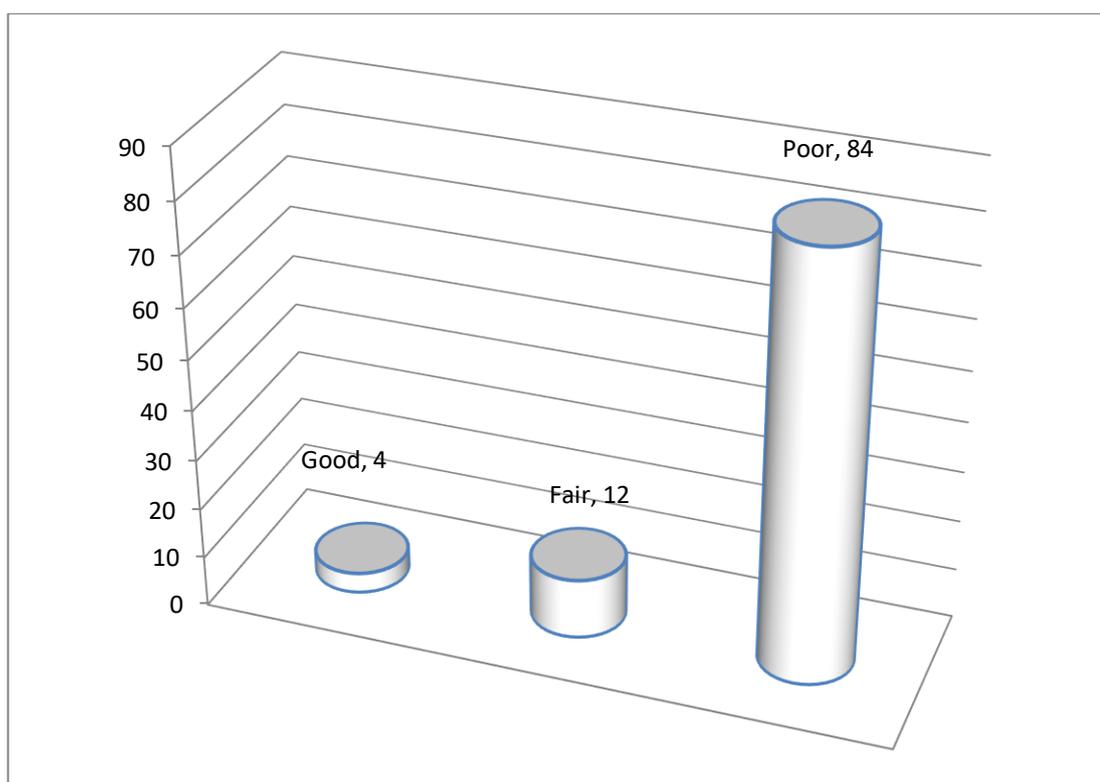
Figure 4-10: Diabetic Patients Self Care Responses at the Pre-test

Table 4-18: Responses of Study group Patients at Post-test 1 Regarding Self-Care

	self -care Items	Post-test 1 Study Group		
		M.s.	SD	Ass.
1	Eat from 175-250 grams of carbohydrate (including mostly, bread and rice /per day	2.64	0.757	Good
2	I take at least one potato meal daily	2.84	0.473	Good
3	Unsweetened fruit juice is appropriate for the condition	2.64	0.757	Good
4	My diet should be less fatty	2.84	0.473	Good
5	My diet includes fiber vegetables and fruits like apple	2.76	0.597	Good
6	Meals must be small and multiple(5)meal	2.84	0.473	Good
7	Taking any over counter medication	2.88	0.440	Good
8	Taking any over counter vitamins ,or supplements	2.76	0.597	Good
9	It is important to read and use food labels as a dietary guide	2.76	0.597	Good
10	Taking diabetes medications. Diabetes pills	2.80	0.577	Good
11	Bicycling (including stationary exercise bike)10 mint	2.80	0.577	Good
12	Engaging in carrying or lifting heavy loads digging or constructing work for (10) mint	2.80	0.577	Good
13	Engaging in physical activities like traveling and shopping	2.72	0.678	Good
14	Engaging in other sports and fitness (leisure) for 10 mints	2.80	0.577	Good
15	Performing sports and fatness as walk and swimming	2.80	0.577	Good
16	Reducing driving	2.80	0.577	Good
17	Reducing lift using	2.56	0.821	Good
18	Wash the feet every day	2.64	0.700	Good
19	Drying up between toes	2.76	0.597	Good
20	Using moistening cream on feet	2.76	0.597	Good
21	I reach and see the bottoms of my feet	2.76	0.597	Good
22	Always test the water temperature before putting the foot in it	2.76	0.597	Good
23	It is important to clean a cut with iodine and	2.68	0.690	Good

	alcohol			
24	Diabetics take extra care when cutting their toenails.	2.80	0.577	Good
25	Tight elastic shoes or socks are bad for diabetics.	2.68	0.690	Good
26	Blood sugar must be cheek early morning before breakfast	2.76	0.597	Good
27	A glucose meter must be available at home	2.84	0.473	Good
28	Medication is more important than diet.	2.72	0.678	Good
29	Medication important than exercise to control my diabetes.	2.76	0.597	Good
30	Keep on appointments and visit the health care facility for follow-up and exposure to health education	2.72	0.614	Good

"Cut of point (0.66), (M.s) mean of score (0.66) Poor, (M.s.=1-1.66) Fair,

(M.s.=1.67-2.33), and Good (M.s.≥2.34)"

The findings of this table demonstrated the assessment of the study sample's self-care at the post-test(1). The study results indicate that the study group at the post-test wear good at all studied items (M.s.≥2.34).

Table 4-19: Overall Assessment of the Study Sample Responses at the Post-test 1 for Study Group self-care

Overall Assessment of Study Group	Post-test 1 Study Group			
	Freq.	%	Overall M.s.	Ass.
Poor Self care	1	4.0		
Fair Self Care	1	4.0	2.756	**Good Self Care**
Good Self Care	23	92.0		
Total	25	100.0		

"Cut of point (0.66), (M.s) mean of score (0.66) Poor, (M.s.=1-1.66) Fair,

(M.s.=1.67-2.33), and Good (M.s.≥2.34)"

Table (4-19) showed that the majority of the study group responses at the post-test one had good self-care with a statistical mean score equal to (2.756).
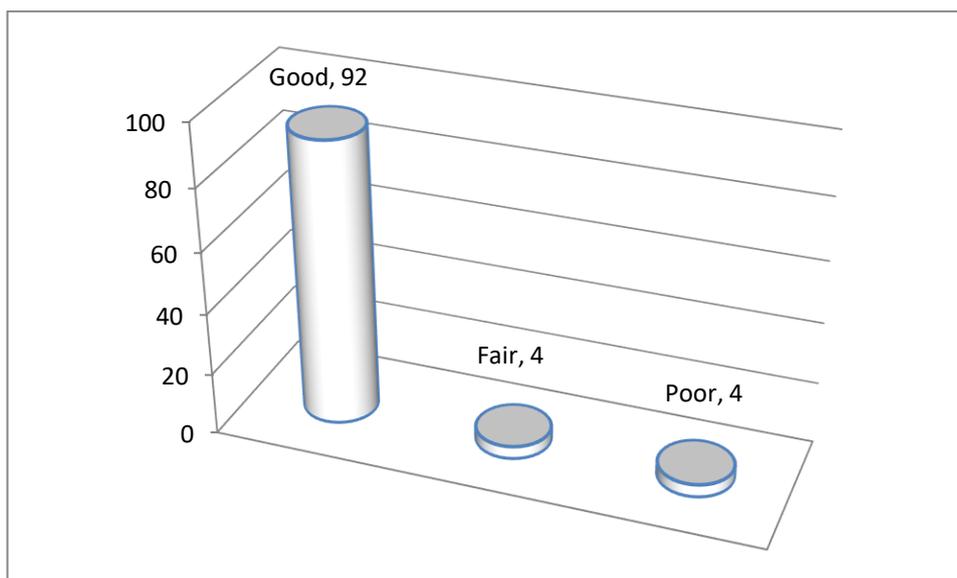
Figure 4-11: Diabetic Patients Self Care Responses at the Pre-test 1

Table 4-20:Statistical distribution of the Study Group by their overall responses related to self-care with Significant Difference between

Pre-test and Post-test

Tested paired	Periods of Measurement	Mean of Score	N	Std. Deviation	t-value	d.f.	p-value
Study group overall responses	Pre-test	1.242	25	0.500	13.394	24	0.000 HS
	Post-test 1	2.756	25	0.440			

Scores self-care (M.s) mean of score, (S.d), (Ns): Non-significant (S): significant, (t-value): t-test, (D f): degree of freedom""

Findings illustrated that there wear a high-significant difference between the study group's overall responses in two periods of measurements (pre-test and post-test) at a p-value less than 0.01, for the statistical procedure of mean of score and t-test, the study results indicate that there wear an improvement in the patients self-care at the post-test compared with pre-test scores.
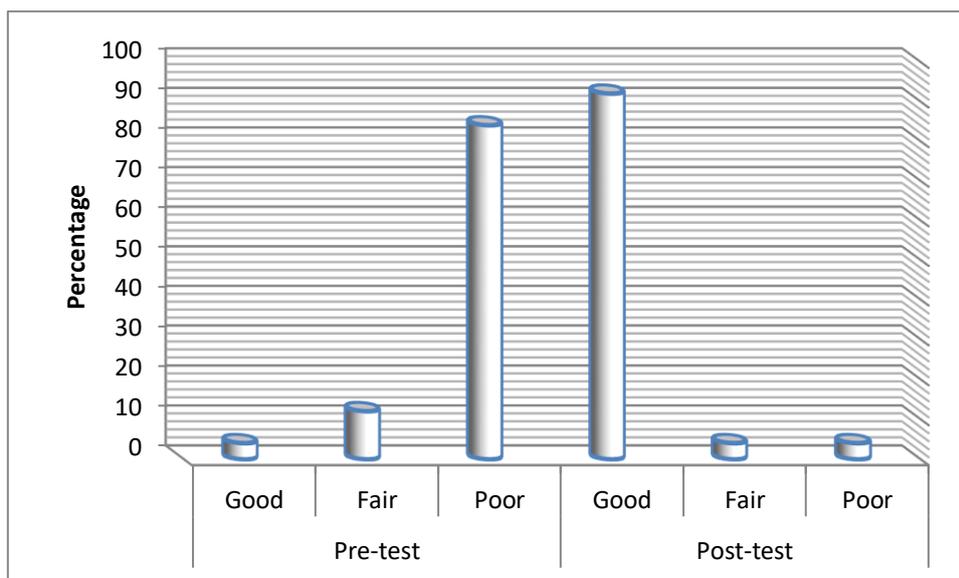
Figure 4-12:Comparison between the Overall Study Group Responses at two levels of measurement (pre-test and post-test)

Table 4-21: Responses of Study Group Patients at Post-test 2 about Self-Care

	Self-Care Items	Post-test 2 Study Group		
		M.s.	SD	Ass.
1	Eat from 175-250 grams of carbohydrate (including mostly, bread and rice /per day	2.44	0.870	Good
2	I take at least one potato meal daily	2.60	0.707	Good
3	Unsweetened fruit juice is appropriate for the condition	2.40	0.866	Good
4	My diet should be less fatty	2.68	0.627	Good
5	My diet includes fiber vegetables and fruits like apple	2.68	0.557	Good
6	Meals must be small and multiple(5)meal	2.68	0.627	Good
7	Taking any over counter medication	2.64	0.700	Good
8	Taking any over counter vitamins ,or supplements	2.68	0.476	Good
9	It is important to read and use food labels as a dietary guide	2.72	0.542	Good
10	Taking diabetes medications. Diabetes pills	2.68	0.557	Good
11	Bicycling (including stationary exercise bike)10 mint	2.60	0.645	Good
12	Engaging in carrying or lifting heavy loads digging or constructing work for (10) mint	2.60	0.645	Good

13	Engaging in physical activities like traveling and shopping	2.56	0.712	Good
14	Engaging in other sports and fitness (leisure) for 10 mints	2.64	0.569	Good
15	Performing sports and fatness as walk and swimming	2.56	0.712	Good
16	Reducing driving	2.68	0.476	Good
17	Reducing lift using	2.36	0.810	Good
18	Wash the feet every day	2.44	0.712	Good
19	Drying up between toes	2.64	0.569	Good
20	Using moistening cream on feet	2.48	0.714	Good
21	I reach and see the bottoms of my feet	2.60	0.645	Good
22	Always test the water temperature before putting a foot in it	2.68	0.627	Good
23	It is important to clean a cut with iodine and alcohol	2.52	0.770	Good
24	Diabetics take extra care when cutting their toenails.	2.48	0.770	Good
25	Tight elastic shoes or socks are bad for diabetics.	2.52	0.714	Good
26	Blood sugar must be cheek early morning before breakfast	2.56	0.712	Good
27	A glucose meter must be available at home	2.52	0.714	Good
28	Medication is more important than diet.	2.48	0.770	Good
29	Medication important than exercise to control my diabetes.	2.72	0.542	Good
30	Keep on appointments and visit the health care facility for follow-up and exposure to health education	2.56	0.712	Good

"Cut of point (0.66), (M.s) mean of score (0.66) Poor, (M.s.=1-1.66) Fair, (M.s.=1.67-2.33), and Good (M.s.≥2.34)"

Findings illustrated assessment of the patient's self-care in the post-test two for the study group. The study results indicate that the study group achieved the post-test two are good at all studied items (M.s.=≥2.34).

Table 4-22: Overall Assessment of the Study Sample Responses concerning self-care at the Post-test 2 for Study Group

Overall Assessment of Study Group	Post-test 2 Study Group			
	Freq.	%	Overall M.s.	Ass.
Good Self-care	20	80.0		
Fair Self Care	3	12.0	2.58	Good Self Care
Poor Self Care	2	8.0		
Total	25	100.0		

"Cut of point (0.66), (M.s) mean of score (0.66) Poor, (M.s.=1-1.66) Fair, (M.s.=1.67-2.33), and Good (M.s.≥2.34)"

This table indicated that the majority of the study group responses to the post-test two had good self-care with a statistical mean of score equal to(2. 58).
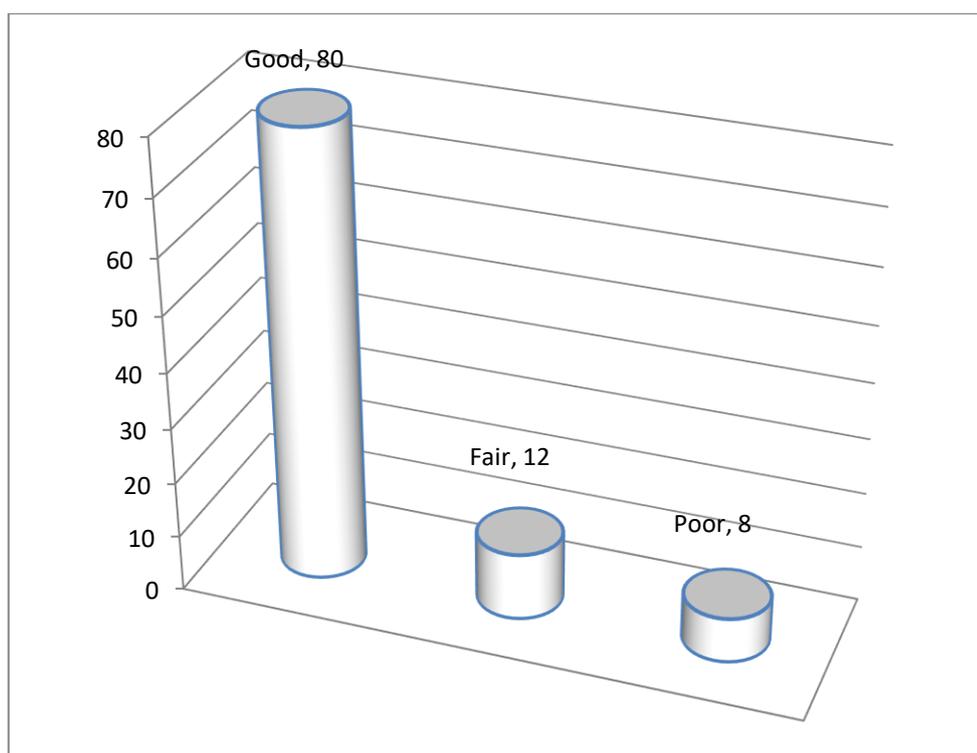

Figure 4-13: Diabetic Patients Self Care Responses at the Pre-test(2)

Table 4-23:Statistical distribution of the Study Group by their overall responses related to self-care with Significant Difference between Post-test One and Post-test Two Scores self-care

Tested paired	Periods of Measurement	Mean of Score	N	Std. Deviation	t-value	d.f.	p-value
Study group overall responses	Post-test 1	2.62	25	0.332	1.281	24	0.212 NS
	Post-test 2	2.58	25	0.614			

"(Ns): Non-significant (S): significant, (t- value): t-test, (D f): degree of freedom"

Table(4-23) declared that there was a non-significant difference between the study group's overall responses in two periods of measurements (post-test one and post-test two) at a p-value of more than 0.05, for the statistical mean of score and t-test, the study results indicated that level of self-care remains the same even if it is measured over a while.
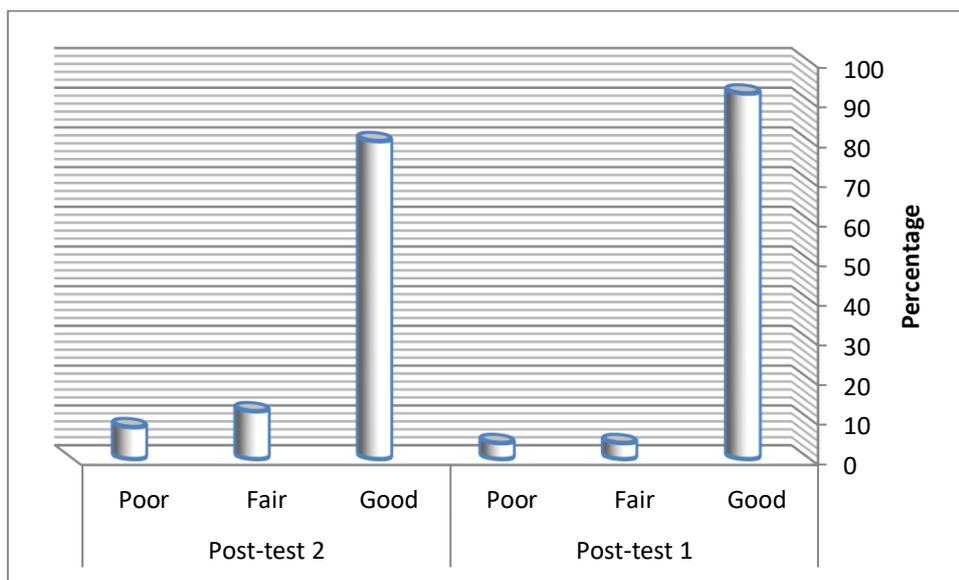
Figure 4-14:Comparison between the Overall Study Group Responses at two levels of measurement (Post-test 1 and post-test 2)

Table 4-24: Responses of Control Group Patients at Pre-test Regarding Self Care

	Self-Care Items	Pre-test Control Group		
		M.s.	SD	Ass.
1	Eat from 175-250 grams of carbohydrate (including mostly, bread and rice /per day	1.2	0.500	Poor
2	I take at least one potato meal daily	1.24	0.597	Poor
3	Unsweetened fruit juice is appropriate for the condition	1.20	0.500	Poor
4	My diet should be less fatty	1.24	0.523	Poor
5	My diet includes fiber vegetables and fruits like apple	1.20	0.500	Poor
6	Meals must be small and multiple(5)meal	1.32	0.627	Poor
7	Taking any over counter medication	1.16	0.473	Poor
8	Taking any over counter vitamins ,or supplements	1.16	0.374	Poor
9	It is important to read and use food labels as a dietary guide	1.24	0.523	Poor
10	Taking diabetes medications. Diabetes pills	1.40	0.764	Poor
11	Bicycling (including stationary exercise bike)10 mint	1.28	0.614	Poor
12	Engaging in carrying or lifting heavy loads digging or constructing work for (10) mint	1.32	0.690	Poor
13	Engaging in physical activities like traveling and shopping	1.36	0.700	Poor
14	Engaging in other sports and fitness (leisure) for 10 mints	1.36	0.700	Poor
15	Performing sports and fatness as walk and swimming	1.32	0.627	Poor
16	Reducing driving	1.32	0.627	Poor
17	Reducing lift using	1.36	0.700	Poor
18	Wash the feet every day	1.40	0.707	Poor
19	Drying up between toes	1.32	0.627	Poor
20	Using moistening cream on feet	1.32	0.627	Poor
21	I reach and see the bottoms of my feet	1.40	0.707	Poor
22	Always test the water temperature before putting the foot in it	1.20	0.408	Poor
23	It is important to clean a cut with iodine and	1.20	0.500	Poor

	alcohol			
24	Diabetics take extra care when cutting their toenails.	1.20	0.500	Poor
25	Tight elastic shoes or socks are bad for diabetics.	1.20	0.408	Poor
26	Blood sugar must be cheek early morning before breakfast	1.28	0.542	Poor
27	A glucose meter must be available at home	1.20	0.408	Poor
28	Medication is more important than diet.	1.28	0.542	Poor
29	Medication important than exercise to control my diabetes.	1.32	0.627	Poor
30	Keep on appointments and visit the health care facility for follow-up and exposure to health education	1.28	0.614	Poor

"Cut of point (0.66), (M.s) mean of score (0.66) Poor, (M.s.=1-1.66) Fair, (M.s.=1.67-2.33), and Good (M.s.≥2.34)"

Tables 4-24 show an assessment of the study sample responses about self-care at the pre-test for the control group. The study results indicate that the control group in the pre-test is poor in all studied items (M.s.=1-1.66).

Table 4-25: Overall Assessment of the Study Sample Responses at the Pre-test for Control Group Self-care.

Overall Assessment for Control Group	Pre-test Control Group			
	Freq.	%	Overall M.s.	Ass.
Poor Self care	23	92.0	1.276	Poor Self Care
Fair Self Care	2	8.0		
Good Self Care	0	0.0		
Total	25	100.0		

"Cut of point (0.66), (M.s) mean of score (0.66) Poor, (M.s.=1-1.66) Fair, (M.s.=1.67-2.33), and Good (M.s.≥2.34)"

Results of this table show that the majority of the control group responses at the pre-test are poor self-care with a statistical mean score equal to (1.276).
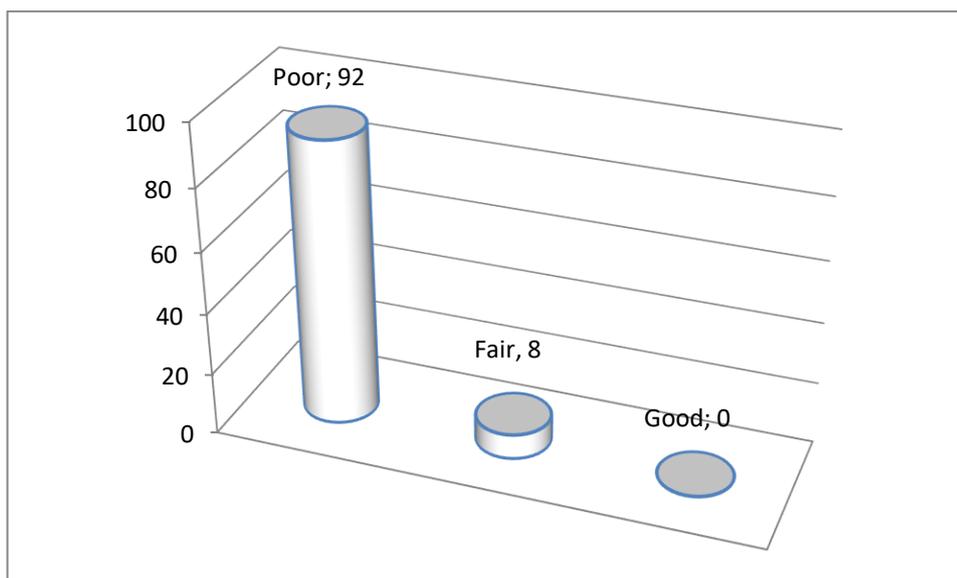
Figure 4-15:Diabetic Patients Self Care Responses at the Pre-test

Table 4-26: Responses of Control Group Patients at Post-test Regarding Self Care

	Self-Care Items	Post-test Control Group		
		M.s.	SD	Ass.
1	Eat from 175-250 grams of carbohydrate (including mostly, bread and rice /per day	1.56	0.583	Poor
2	I take at least one potato meal daily	1.32	0.627	Poor
3	Unsweetened fruit juice is appropriate for the condition	1.28	0.542	Poor
4	My diet should be less fatty	1.28	0.542	Poor
5	My diet includes fiber vegetables and fruits like apple	1.28	0.542	Poor
6	Meals must be small and multiple(5)meal	1.36	0.638	Poor
7	Taking any over counter medication	1.32	0.627	Poor
8	Taking any over counter vitamins ,or supplements	1.32	0.557	Poor
9	It is important to read and use food labels as a dietary guide	1.32	0.557	Poor
10	Taking diabetes medications. Diabetes pills	1.32	0.627	Poor
11	Bicycling (including stationary exercise bike)10 mint	1.28	0.542	Poor
12	Engaging in carrying or lifting heavy loads digging or constructing work for (10) mint	1.28	0.614	Poor
13	Engaging in physical activities like traveling and	1.36	0.638	Poor

	shopping			
14	Engaging in other sports and fitness (leisure) for 10 mints	1.36	0.638	Poor
15	Performing sports and fatness as walk and swimming	1.36	0.638	Poor
16	Reducing driving	1.32	0.557	Poor
17	Reducing lift using	1.44	0.712	Poor
18	Wash the feet every day	1.32	0.627	Poor
19	Drying up between toes	1.40	0.707	Poor
20	Using moistening cream on feet	1.44	0.651	Poor
21	I reach and see the bottoms of my feet	1.44	0.651	Poor
22	Always test the water temperature before putting the foot in it	1.36	0.569	Poor
23	It is important to clean a cut with iodine and alcohol	1.20	0.500	Poor
24	Diabetics take extra care when cutting their toenails.	1.24	0.523	Poor
25	Tight elastic shoes or socks are bad for diabetics.	1.28	0.542	Poor
26	Blood sugar must be cheek early morning before breakfast	1.32	0.557	Poor
27	A glucose meter must be available at home	1.20	0.500	Poor
28	Medication is more important than diet.	1.20	0.577	Poor
29	Medication important than exercise to control my diabetes.	1.28	0.542	Poor
30	Keep on appointments and visit the health care facility for follow-up and exposure to health education	1.40	0.707	Poor

"Cut of point (0.66), (M.s) mean of score (0.66) Poor, (M.s.=1-1.66) Fair, (M.s.=1.67-2.33), and Good (M.s.≥2.34)"

The findings of table 4-26 reveal an assessment of the study sample responses at the post-test for the control group concerning self-care. The study results indicate that the control group at the post-test is poor in all studied items (M.s.=1-1.66).

Table 4-27: Overall Assessment of the Study Sample Responses at the Post-test for Control Group self-care

Overall Assessment for Control Group	Post-test Control Group			
	Freq.	%	Overall M.s.	Ass.
Poor Self care	22	88.0	1.328	Poor Self Care
Fair Self Care	2	8.0		
Good Self Care	1	4.0		
Total	25	100.0		

"Cut of point (0.66), (M.s) mean of score (0.66) Poor, (M.s.=1-1.66) Fair, (M.s.=1.67-2.33), and Good (M.s.$\geq$2.34)"

This table indicated that the majority of the control group responses at the post-test had poor self-care with a statistical mean of score equal to =(1.328).
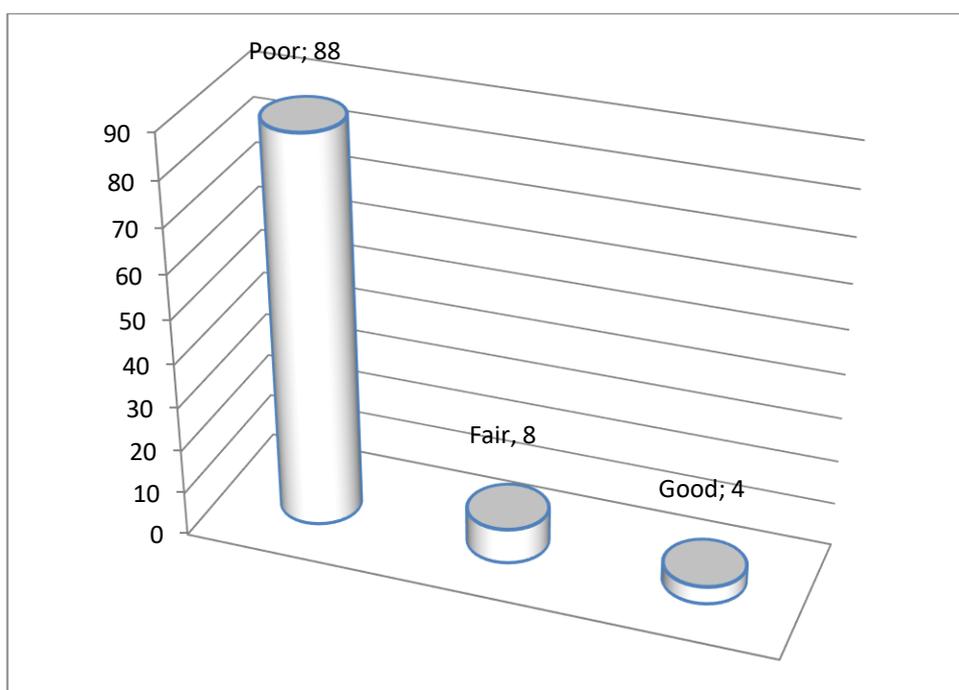
Figure 4-16: Diabetic Patients Self Care Responses at the Pre-test

Table 4-28:Statistical distribution of the Control Group by their overall responses with Significant Difference between pre-test and Post-test Scores self-care

Tested paired	Periods of Measurement	Mean of Score	N	Std. Deviation	t-value	d.f.	p-value
Control group overall responses	Pre-test	1.276	25	0.277	0.811	24	0.425 NS
	Post-test	1.328	25	0.473			

"(Ns): Non-significant (S): significant , (t- value): t-test, (D f): degree of freedom"

The findings of the abovementioned table demonstrated that there is a no-significant difference between the control group's overall responses to the self-care in two periods of measurements (pre-test and post-test) at a p-value of more than 0.05, for the statistical mean of score and t-test value, the study results indicated that there were no changes in the patients self-care at the post-test compared with pre-test scores.
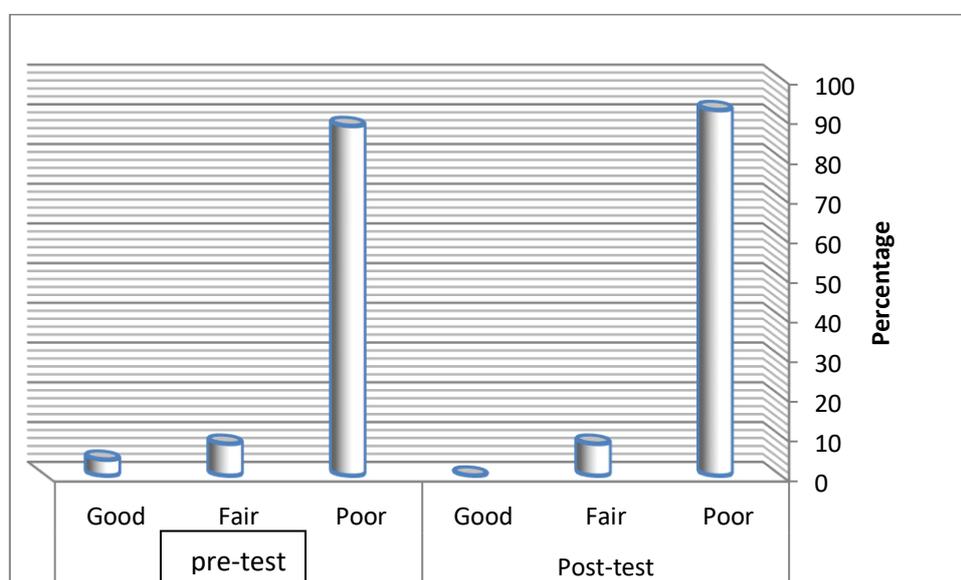
Figure 4-17: Comparison between the overall control group responses at two levels of measurement (pre-test and post-test)

Table 4-29: Difference between the Study and Control Group responses at pre-test and post-test

Periods of measurements	Groups	N	Mean	Std. Deviation	t-value	d.f.	p-value
Pre-test	Study	25	1.242	0.500	0.730	48	0.469 NS
	Control	25	1.276	0.277			
Post-test	Study	25	2.756	0.440	12.616	48	0.000 HS
	Control	25	1.328	0.473			

This table showed that there were a non-significant difference between the study and control groups in the pre-test concerning self-care of participants at a p-value of more than 0.05, while there is a highly significant difference between the study and control groups in the post-test with a p-value less than 0.01. For the statistical mean the study results indicate that there is an improvement in the study group's responses after the application of the program compared with the control group.
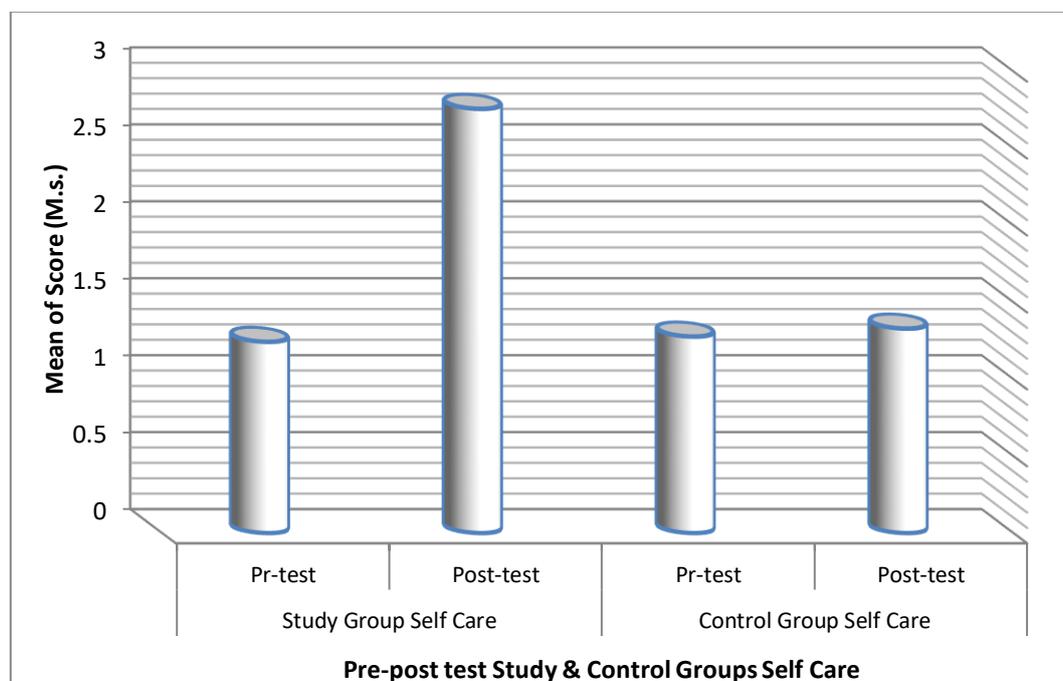
Figure 4-18:Comparison between the overall study and control groups' responses at two levels of measurement (pre-test and post-test)

Table 4-30:Association between the Patient's Knowledge in Study Group responses at the Pre-test Measurement and their Demographic Data

Demographic Data	Chi-Square Value	D.f	P-Value	
Age	3.299	5	0.654	NS
Gender	0.586	1	0.444	NS
Education	4.167	3	0.384	NS
Marital Status	0.260	2	0.878	NS
Family type	0.142	1	0.706	NS
Occupation	1.852	3	0.604	NS
Residents	2.679	1	0.102	NS
Economic	0.490	2	0.783	NS

D.F. = degree of freedom,   P. = probability value NS=Non -significant

Table(4-30) showed that there were is a non-significant association between the patients of study group knowledge (pre-test) and their demographic data at a p-value of more than 0.05.

Table 4-31: Relationship between Patients Knowledge of the Study Group responses at the Post-test Measurement and their Demographic Data

Demographic Data	Chi-Square Value	D.f	P-Value	
Age	2.355	5	0.798	NS
Gender	0.185	1	0.667	NS
Education	3.164	2	0.531	NS
Marital Status	0.543	2	0.762	NS
Family type	0.296	1	0.586	NS
Occupation	2.242	3	0.524	NS
Residents	0.522	1	0.470	NS
Economic	1.023	2	0.600	NS

D.F. = degree of freedom,   P. = probability value NS=Non -significant

Results reveal that there is a non-significant association between the patient of study group knowledge (post-test) and their demographic data at a p-value of more than 0.05.

Table 4-32: Relationship between the Patient's level of Knowledge in Control Group responses at the Pre-test Measurement and their Demographic Data

Demographic Data	Chi-Square Value	D.f	P-Value	
Age	3.696	10	0.960	NS
Gender	2.767	2	0.251	NS
Education	6.884	4	0.549	NS
Marital Status	1.223	4	0.874	NS
Family type	0.845	2	0.655	NS
Occupation	8.075	6	0.233	NS
Residents	2.355	2	0.308	NS
Economic	2.007	4	0.735	NS

D.F. = degree of freedom,   P. = probability value NS=Non -significant

This finding shows that there is a non-significant association between the patient in the control group concerning knowledge (pre-test) and their demographic data at a p-value of more than 0.05.

Table 4-33: Relationship between the Patient's Knowledge in Control Group responses at the Post-test Measurement and their Demographic Data

Demographic Data	Chi-Square Value	D.f	P-Value	
Age	10.758	10	0.377	NS
Gender	0.834	2	0.659	NS
Education	4.119	4	0.846	NS
Marital Status	5.227	4	0.265	NS
Family type	1.326	2	0.515	NS
Occupation	6.304	6	0.390	NS
Residents	3.147	2	0.207	NS
Economic	3.147	4	0.534	NS

D.F. = degree of freedom,   P. = probability value NS=Non -signficans

This table showed that there were a non-significant association between the patient control group knowledge (post-test) and their demographic data at a p-value of more than 0.05.

Table 4-34: Relationship between the Patients Self Care in Study Group responses at the Pre-test Measurement and they are Demographic Data

Demographic Data	Chi-Square Value	D.f	P-Value	
Age	8.333	10	0.596	NS
Gender	3.505	2	0.173	NS
Education	8.980	4	0.344	NS
Marital Status	1.865	4	0.761	NS
Family type	1.551	2	0.460	NS
Occupation	5.899	6	0.435	NS
Residents	2.797	2	0.247	NS
Economic	0.887	4	0.926	NS

D.F. = degree of freedom,   P. = probability value NS=Non -signficans

Table(4-34) reversal that there were a non-significant association between the patient at study group self-care (pre-test) and their demographic data at p-value more than 0.05.

Table 4-35: Relationship between the Patients Self Care in Study Group responses at the Post-test Measurement and they are Demographic Data

Demographic Data	Chi-Square Value	D.f	P-Value	
Age	15.217	10	0.124	NS
Gender	1.223	2	0.543	NS
Education	8.075	4	0.426	NS
Marital Status	0.543	4	0.969	NS
Family type	0.296	2	0.862	NS
Occupation	6.304	6	0.390	NS
Residents	3.002	2	0.223	NS
Economic	1.023	4	0.906	NS

D.F. = degree of freedom,   P. = probability value NS=Non -signficans

Findings show that there is a non-significant association between the patient in the study group's self-care (post-test) and their demographic data at a p-value of more than 0.05.

Table 4-36: Relationship between the Patients Self Care in Control Group responses at the Pre-test Measurement and their Demographic Data

Demographic Data	Chi-Square Value	D.f	P-Value	
Age	3.714	5	0.591	NS
Gender	0.032	1	0.859	NS
Education	1.789	2	0.775	NS
Marital Status	1.393	2	0.498	NS
Family type	0.845	1	0.358	NS
Occupation	2.032	3	0.566	NS
Residents	0.003	1	0.953	NS
Economic	2.007	2	0.367	NS

D.F. = degree of freedom, P. = probability value NS=Non -significant

The findings of the aforementioned table demonstration that there was a non-significant association between the patient in the control group's self-care (pre-test) and their demographic data at a p-value of more than 0.05.

Table 4-37: Relationship between the Patients Self Care in Control Group responses at the Post-test Measurement and their Demographic Data

Demographic Data	Chi-Square Value	D.f	P-Value	
Age	5.114	10	0.883	NS
Gender	0.834	2	0.659	NS
Education	7.102	4	0.526	NS
Marital Status	1.918	4	0.751	NS
Family type	3.355	2	0.187	NS
Occupation	4.600	6	0.596	NS
Residents	1.144	2	0.564	NS
Economic	3.147	4	0.534	NS

D.F. = degree of freedom, P. = probability value NS=Non -signficans

The results showed that there was a non-significant association between the patient in the control group's self-care (post-test) with their demographic data at a p-value of more than 0.05.

Table 4-38: Relationship between the Patient's Knowledge in Study Group responses at the Pre-test Measurement and their Clinical Data

Clinical Data	Chi-Square Value	D.f	P-Value	
BMI	2.214	2	0.137	NS
Smoking status	0.962	3	0.811	NS
History of food allergy	0.091	1	0.763	NS
Family history of DM	0.329	1	0.566	NS
Duration of disease	0.260	2	0.878	NS

D.F. = degree of freedom,   P. = probability value NS=Non -significant

Findings indicated that there was a non-significant association between the patient at study group knowledge (pre-test) and their clinical data at a p-value of more than 0.05.

Table 4-39:Relationship between the Patient's Knowledge in Study Group responses at the Post-test Measurement and their Clinical Data

Clinical Data	Chi-Square Value	D.f	P-Value	
BMI	1.023	2	0.312	NS
Smoking status	1.136	3	0.768	NS
History of food allergy	0.189	1	0.664	NS
Family history of DM	0.806	1	0.369	NS
Duration of disease	0.543	2	0.762	NS

D.F. = degree of freedom,   P. = probability value NS=Non -significant

This finding showed that there was a non-significant association between the patient study group knowledge (post-test) and their clinical data at a p-value of more than 0.05.

Table 4-40: Relationship between the Patient's Knowledge in Control Group responses at the Pre-test Measurement and their Clinical Data

Clinical Data	Chi-Square Value	D.f	P-Value	
BMI	4.907	4	0.297	NS
Smoking status	1.023	6	0.985	NS
History of food allergy	4.348	2	0.114	NS
Family history of DM	2.355	2	0.308	NS
Duration of disease	5.882	4	0.208	NS

D.F. = degree of freedom,   P. = probability value NS=Non -significant

Table(4-40) showed that there was a non-significant association between the patient control group knowledge (pre-test) and their clinical data at a p-value of more than 0.05.

Table 4-41: Relationship between the Patient's Knowledge in Control Group responses at the Post-test Measurement and their Clinical Data

Clinical Data	Chi-Square Value	D.f	P-Value	
BMI	3.636	4	0.069	NS
Smoking status	8.512	6	0.203	NS
History of food allergy	1.420	2	0.492	NS
Family history of DM	0.734	2	0.693	NS
Duration of disease	2.473	4	0.649	NS

D.F. = degree of freedom,   P. = probability value NS=Non -significance

The results of this table show that there was a non-significant association between the patient control group knowledge (post-test) and their demographic data at a p-value of more than 0.05.

Table 4-42: Relationship between the Patients Self Care in Study Group responses at the Pre-test Measurement and their Clinical Data

Clinical Data	Chi-Square Value	D.f	P-Value	
BMI	0.490	2	0.783	NS
Smoking status	1.661	6	0.948	NS

History of food allergy	0.414	2	0.813	NS
Family history of DM	4.114	2	0.128	NS
Duration of disease	1.190	4	0.880	NS

D.F. = degree of freedom,   P. = probability value NS=Non -significance

This study's results show that there is a non-significant association between the patient in the study group's self-care (pre-test) and their clinical data at a p-value of more than 0.05.

Table 4-43: Relationship between the Patient's Self-Care in Study Group responses at the Post-test Measurement and their Clinical Data

Demographic Data	Chi-Square Value	D.f	P-Value	
BMI	1.023	2	0.600	NS
Smoking status	4.181	6	0.652	NS
History of food allergy	0.189	2	0.910	NS
Family history of DM	0.686	2	0.709	NS
Duration of disease	0.543	4	0.969	NS

D.F. = degree of freedom,   P. = probability value NS=Non -significance

Findings show that there is a non-significant association between the patient in the study group's self-care (post-test) and their clinical data at a p-value of more than 0.05.

Table 4-44: Relationship between the Patients Self Care in Control Group responses at the Pre-test Measurement and their Clinical Data

Demographic Data	Chi-Square Value	D.f	P-Value	
BMI	8.696	2	0.013	NS
Smoking status	3.154	3	0.368	NS
History of food allergy	1.223	1	0.269	NS
Family history of DM	1.223	1	0.269	NS
Duration of disease	2.022	2	0.364	NS

D.F. = degree of freedom,   P. = probability value   NS=Non -significance

Table (4-44) illustrated that there is a non-significant association between the patient in the control group's self-care (pre-test) and their clinical data at a p-value of more than 0.05.

Table 4-45: Relationship between the Patients Self Care in Control Group responses at the Post-test Measurement and their Clinical Data

Clinical Data	Chi-Square Value	D.f	P-Value	
Economic	3.147	4	0.534	NS
BMI	3.458	4	0.484	NS
Smoking status	1.604	6	0.952	NS
History of food allergy	5.682	2	0.058	NS
Family history of DM	1.918	2	0.383	NS
Duration of disease	2.473	4	0.649	NS

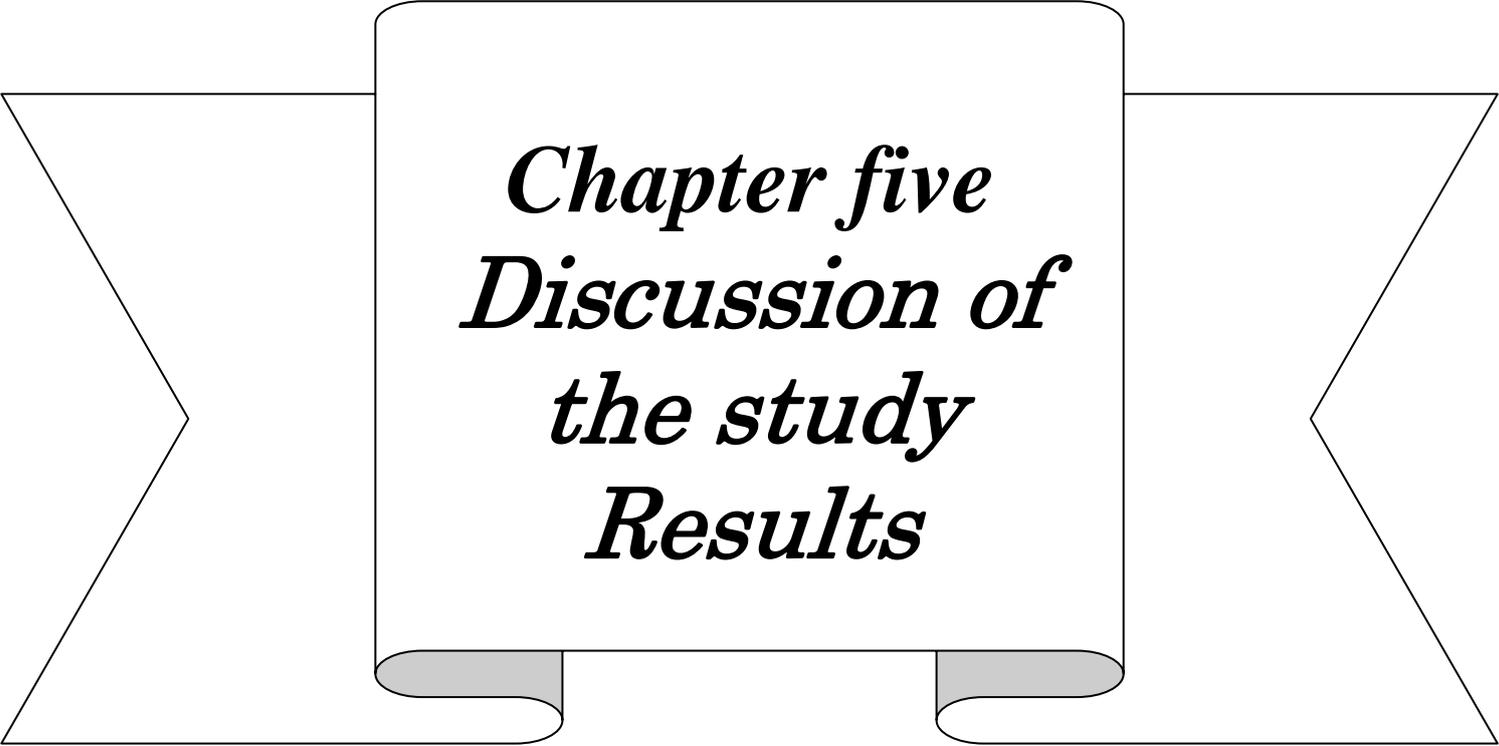**D.F. = degree of freedom, P. = probability value NS=Non -significance**

The finding of this table indicated that there was a non-significant association between the patient in the control group's self-care (post-test) and their clinical data at a p-value of more than 0.05.

Chapter five
Discussion of the study Results

Chapter Five:

Discussion of the Study Results

This chapter presents a systematically designed interpretation and reasonably derived discussion of the results reported in Chapter Four. The interpretation of the results in this chapter is supported by available related studies as well as the researcher's point of view.

5.1. Discussion of the Socio-Demographic Characteristics of patients with Diabetes Mellitus Type II at the Diabetes Centers

The findings of this study showed the distribution of the study participants according to their demographical data in terms of frequency and percentage (study versus control). The age of diabetic patients showed that more than one-third of the Study Group and Control Group ranged from 60 years and older. As for gender, females were highly represented in both Control and Study Group, accounting for 64 % and 56 % of the total. respectively the design of the study affected this result, the age group most affected showed that old ages are more influenced, female and their predominate might be accidental only as it is well known that most cases of diabetes were among the males. This result agrees also with the study by Al-Mansour,(2020) at Al-Majmaah city in Saudi Arabia, which indicated that the majority of the age group at 40 and older and the majority of them are female (34.9 %, 53.3 %), respectively for Control and Study Group. Concerning the level of education, the distribution of the findings in the current study indicated that the Study and Control Group were literate (44%, 52%) respectively. This variable is very crucial in such studies due to it is the effect on the patient cognitive perception and how they recognize the real prognosis of their disease condition and the follow-up and updating their information. This result agreed with the study done by F. Mersal, (2018) in Egypt, which indicated that the highest percentages had basic educational levels (read and write) for both groups.

According to marital status, both Study and Control Groups were married and constituted (80% and 64%), of the nuclear family, respectively The majorities of participants in the Study Group and Control Group were employed, constituting (36% and 32%). Both groups are residents in urban areas and do experience not enough economic state. The Majority of them in both groups were overweight according to body mass index and nonsmokers without a history of food allergy. Both groups had a family history of D.M. and more than one year as a duration of diabetes mellitus. Many risk factors can be considered, as predisposing that may contribute to such chronic conditions. Each of those variables may enhance the ability of the patient to improve or minimize the effect of the illness or it might not and cause a burden on him. An example is if this patient is supported by the family and has a member who looks after him or her regarding their diet, medication, others like the instrument used to measure blood sugar with the tools and assistive devices, the health care team and specialist nurses were called to search the patient history to support or reject the assumption of the family running the same condition. Other medical data which is directly associated with diabetes mellitus such as weight abnormalities, history of smoking, and allergy. Also, these results were consistent with the results of a study by Al-Mansour, (2020), at Al-Majmaah city in Saudi Arabia, which presented that most of the two groups (36.3 %, 63.7%) were married, and the highest percentages were employed and resided was in urban, the majority of them had low monthly income, BMI was overweight (42.3%, 57.7%) for both groups, smoking status indicated non-smoking for two groups, more of them had a family history of DM for both groups, and finally, the majority duration of DM for study and control were (more than 1 year) (Table 4-1).

5.2. Patient's responses (Study Group) at pre-test regarding the level of knowledge of DM type II

The results of the current research demonstrated that the Study group answers in the pre-test showed a poor level of knowledge of all studied items except (Diabetes is a serious disease**).** The responses were fair. The majority of the responses to the pre-test obtained fail scores of knowledge.

It is an expected result for many reasons, such as the size of the sample and the nature of the participants. Because of the low sample size, which was 50 participants, the researcher was unable to gather more participants which might give a negative impression about the knowledge of the sample. In addition, the nature of the subjects according to the study design has a significant impact on the poor level of knowledge.

The present study agreed with the study of Mersal (2018), at Ain Shams University in Egypt, which showed that the majority of patients' knowledge items were poor in the pre-test for the Study Group. Furthermore, the patients had poor knowledge about diabetes mellitus regarding causes, signs and symptoms, nature of the disease, treatment, and self-care.

On the other hand, Hartayu & Suryawati (2012) h found in their study that the majority of participants' responses were good and only a few of them obtained poor knowledge. Patients had good knowledge about the disease and its aspects. Therefore, their educational program made little change in their knowledge (Table 4-2) and (Table 4-3).

5.3 Differences in the distribution of the study group by their overall responses with significant differences between pre-test and post-test scores.

The results revealed that the level (pass) is what the Study Group gets at the post-test for all studied items, and showed that the majority of responses are with a good level of knowledge. They also reported high-significant differences between the two different periods of measuring (pre-test

and post-test) of Study Group responses at a P-value < 0.01. The study's findings show that patients' knowledge improved after the post-test when compared to their pre-test score. These results show the increase in the study sample knowledge, and this indicates the effectiveness of the program in increasing this knowledge.

In the researcher's opinion, any kind of educational program which targets patients and aims to modify or strengthen their previous knowledge will lead to improving patient knowledge. In addition, the essence of the educational program is to make a significant change in the previous poor knowledge condition in those patients at post-test. Furthermore, patients benefitted from the information received about diabetes mellitus.

These results agreed with the study by Othman (2014) in Erbil Iraq, which reported that most patients' knowledge at post-test with the Study Group was a good level of knowledge. In addition, patients had increased knowledge in the post-test in terms of his educational program change their knowledge and attitudes from poor to confident. However, not all the participants in the post-test will get good knowledge as proved by a study by Jackson, Okonta, and Ukwe (2014). They found that there were non-significant differences in patients' knowledge about the disease.in (Table 4-4), (Table 4-5), and (Table 4-6).

5.4. Statistical distribution of the Study Group by their overall responses with Significant Difference between Post-test I and Post-test II Scores

The present study results demonstrated that the study group at the post-test showed good results on all studied items, the majority of the study group responses in the post-test 2 were good knowledge, and there is a no-significant difference between the study group's overall responses in the two periods of measurements (post-test 1 and post-test 2) at p-value more than 0.05, for the

statistical mean of the score, the study results indicated that there is a knowledge remains even if time passes.

The researcher believed that the reasons are in the educational program. As the educational program were more scientific, will be more accurate, and consequent the information is strongly kept in the mind of patients for more periods.

These results were are consistent as well with the results of the study by Mokabel et al., (2017), in Saudi Arabia, which showed that the highest percentage of the study group responses at the post-test are highly good knowledge. Moreover, Xiang, et al., (2017) found in their study that most patients had a good level of knowledge in their educational program, which agrees with what the researcher has found in the current study. Ghazanfari et al. (2007) have found that there was no significant difference in the level of general knowledge about diabetes Mellitus type 2 between the first and second trials in terms of stability of information in patients, which were compatible with the findings of the current study. (Table 4-7), (Table 4-8), and (Table 4-9).

5.5. The overall assessment of the control sample responses at the pre-test.

The study revealed that there were poor results responses of the control group at the pre-test at all items, (Diabetes is a serious disease) the responses were fair knowledge and showed that the majority of the control group responses at the pre-test are poor knowledge.

However a small sample size and the sampling procedure (purposive) have an impact on the knowledge of the control group. The control group did not receive any kind of information. In other words, using purposive sampling techniques lead to selecting patients who need to strengthen their information because their knowledge was at a poor level.

Therefore results a supported by the results of the study by Mersal F., (2018), which refers that the majority of patient's knowledge items had poor

knowledge on the pre-test for the control sample response group. However, Bett (2019) found that the control group in his study had a moderate to a good level of knowledge in the pre-test. (Table 4-10) and (Table 4-11).

5.6. Difference between pre-test and post-test scores:

The results in **(Table 4-12)**, **(Table 4-13)** and **(Table 4-14)** revealed that the control group at the post-test were poor in all studied items except the item (Diabetes is a serious disease**)** the responses had fair knowledge, the majority of the control group responses at the post-test are poor knowledge, and there is a non-significant difference between the control group overall responses in two periods of measurements (pre-test and post-test) at p-value more than 0.05, for the statistical mean, the study results indicated that there was no improvement in the patient's knowledge at the post-test compared with pre-test scores.

The control group was not treated by the current educational program or manipulated by giving training or lecturing and it seems that there were no other sources of information where they may receive.

These results are agreed with the results of the study by Mokabel et al., (2017), done in Saudi Arabia, and showed that the highest percentage of the control group responses in the post-test two were poor knowledge, and there is a non-significant difference between the control group overall responses in two periods of measurements (pre-test and post-test) at p-value more than 0.05. although, Bett (2019) has found that participants of his study had a good level of knowledge in the post-test that confronted with what the researcher found in this study.

5.7. Comparisons among the overall study and Control Group's response at two stages of measurements (pre-test and post-test):

(Table 4-15)   showed that there was a non-significant difference between the study and control groups in the pre-test at a p-value of more than 0.05, while there is a highly significant difference between the study and control groups at

the post-test with a p-value less than 0.01with respect to the statistical mean. The study results indicated that there was an improvement in the study group's level of knowledge after the application of the program compared with the control group.

The investigator worked on the level of knowledge of the study group as the target in a trial to create some changes in this regard by using a well-organized and prepared sessions with different teaching strategies to achieve this goal and it worked, on the hand, the control group missed this opportunity according to the design of the study. Though the investigator did not prevent them to obtain that information from their available sources.

These results are supported also by the resulted of the study of Mersal F., (2018), at Ain Shams University in Egypt, which refers that there is a non-significant difference between the study and control groups in the pre-test at a p-value of more than 0.05, while there was a highly significant difference between the study and control groups at the post-test with p-value less than 0.01.

5.8. Study Group responses at pre-test regarding the self-care:

Findings in **Table (4-16)** and **Table (4-17)** demonstrated the sample response at the pre-test for the Study Group. The study findings indicated that the majority of responses to the pre-test in the Study Group showed poor results in all studied items regarding self-care.

Actually and in normal circumstances, the knowledge is linked to the ability of humans to self-care, thus any improvement in the level of information or gaining new, relevant, and updated will help patients, particularly those that long-life diseases, to adopt more quality self-care and being more independent.

The findings of the current study agree with the findings of the study of Gabish and Mohammed (2018) in Baghdad, Iraq, which indicated that the highest percentage of the study group responses at the pre-test are poor self-

care for all study items. Estrategia et al.(2012) and Foster et al.(2007) mentioned that adopting different existing self-care educational programs will contribute to increasing the ability of diabetic patients to perform self-care if they have a good level of knowledge. On the other hand, these types of intervention are often mentioned in debates about the changes required in health systems to face the current demographic situation. It is, therefore, necessary to provide good quality evidence to guide the selection of appropriate interventions.

5.9. Difference between pre-test and post-test scores regarding self-care:

However the results of the present study in **Tables 18, 19, and 19** indicated that there is a good level of post-test for the study group. Also, there is a high percentage of responses in the post-test about good self-care, and there is a highly significant difference between of responses of pre-and post-test trials at a P-value < 0.01. Therefore these findings show us that there is an enhancement in the patient's self-care at the post-test in comparison with the pre-test score. The researcher can justify that addressing objectives aimed to make changes in the target sample self-care should have good and satisfactory results and put efforts to do this. Such results can also solve patients' problems and encourage more confidentiality.

The present study results well matched the results of Jackson et al. (2014) who found that patient information about self-care for diabetes mellitus was high among the sample participants, even though there were some knowledge gaps. To strengthen patients' knowledge about the concept of self-care, and hence, actively engaged with their self-care, increase, the delivery and frequency of educational diabetic messages, and emphasize assigning patients to the areas where knowledge was insufficient. However, the increase in certain areas of knowledge without consistently improving and developing in being in touch for self-care will be useless and meaningless. As a result, every viable

route for improving adherence must be pursued to achieve a desirable, valued, and beneficial health outcome. As a result, there was an improvement in life quality and productivity, as well as a reduction in the cost of healthcare for the clients, their families, and the community at large.

These results were supported by the results of the study by Garg et al. (2017), in Bengal, which reported that the majority of patients' responses at the post-test were good self-care, and there was a highly significant different distribution among responses of the sample in two periods of measurements at P-value below 0.01.

5.10. Differences between post-test one and post-test two score self-care:

Results in **Tables 21, 22, and 23** proposed that there was a good level in the post-test for those participants in the study group, most of the responses in the 2nd post-test are good regarding self-care. In addition, there was no-significant difference between the responses post-test 1 and post-test 2 at P-values > 0.05. The study results indicated that the self-care level remains the same even if time passes.

Muchiri et al.(2016) mentioned in their study any kind of educational program will be very beneficial for patients with diabetes mellitus, especially self-care. Therefore, patients had to possess a high level of knowledge about how to care for themselves. Further, what Muchiri (2016) has found came with what we found in this current study.

Therefore the result of the current study agrees with the result of the study of Taha et al. (2016) in Egypt at Zagazing University Hospital, which conducted that the most of the patients' responses at the post-test are good regarding self-care and there was no-significant differences among the patients' overall response in both times of measurement at P-value > 0.05.

5.11. Patients (Control Group) responses at pre-test regarding self-care:

The results presented responses at the pre-test for the Control Group. The findings indicated that the pre-test had poor results on all studied items, and showed that the majority of them respond as inadequately in caring for themselves.

There for These findings were expected because the Control Group did not get intervention or other kinds of manipulation, so their knowledge will be at this level though it is very unfortunate to leave them with no organized information unlike with the Study Group. These findings was in consisted with the study by Chiwanga and Njelekela, (2015) in Tanzania, which shows that diabetic patients at the pre-test scored poorly for all studied items, and show that the high ratio of participants in the sample responses at the pre-test was poor for self-care. On the other hand, patients had a poor level of knowledge about diabetes mellitus and self-care aspects and how patients manage their lifestyles. Consequently, they are unable to accommodate episodes of diabetes (Table 4-24) and (Table 4-25).

5.12. Differences between pre-test and post-test scores self-care:

Results in **Tables 26, 27, and 28** revealed that the Control Group did not show any improvement in the post-test assessment. This means that nothing changed regarding the items of self-care. It indicated that the Control Group at the post-test was poor at all studied items regarding self-care. There was a no-significant difference between responses of two different times of measurement (pre-test and post-test) at a P-value > 0.05. This finding reveal that there was no noticeable improvement in the patient's self-care during the post-test compared with the pre-test score. Though sometimes those groups of people may get any information from any sources except the particular investigator, it would not happen in this study for no clear reasons. They did not get this chance.

These results are supported by the results of the study done by Chiwanga and Njelekela (2015) in Tanzania which demonstrations that a high number of the diabetic patient's responses to the post-test scored poor self-care, and there was a non-significant difference among the participants' response in two times of measurement (pre-test and post-test) at P-value > 0.01.

Saleh et al.(2012) support the correct findings of our study by declaring that newly diagnosed type 2 diabetic subjects had similar levels of both basic and technical knowledge of DM repeated support of health education and strong motivation is sure to bring about positive changes in self-care practices about diabetes control. In the other words, patients with diabetes mellitus might have poor knowledge and attitudes about their ability to do themselves care but they need to be reinforced.

5.13. Difference (Independent Sample t-test) between the study and control group responses at pre-test and post-test:

Table 4-29 demonstrated a non-significant difference among the Control and study Groups s in the trial pretest at $p> 0.05$. However, there is a highly significant difference between the Control and study groups in the post-test with P-value < 0.01. indicating that there is an alteration positively in the Study Group response after the doing of the programs in comparison with the Control Group.

These results were similar to the results of the study of Gabish and Mohammed, (2018), in Baghdad, Iraq, which demonstrated a non-significant difference between the study and control groups in the pre-test at a p-value of more than 0.01, while there was a significant difference between the study and control groups at the post-test with p-value less than 0.01

On the other hand, the findings disagreed with Fountain (2002) who has found in her study that the attitude and practice level in the study shows the increasing number of participants who had a good level of attitude and practice

towards diabetes, and diabetes self-care in all groups, with Community Based Interactive Approach-diabetes Mellitus (CBIA-DM) group achieved the highest number of participants. Attitudes and practice were influenced by cultural and religious teachings, as well as school, the peer group, parents, and life experience.

5.14. Association between the Patient's Knowledge in (Study and Control Groups) with their Demographic Data :

Illustrated that **(Table 4-30)**, **(Table 4-31)**, **(Table 4-32), and (Table 4-33)** show a non-significant association between the patient for study and control group knowledge at (pre-test and post-test) with their demographic characteristics at P-value > 0.05 this means that demographic data does not affect improving or increasing the patients' knowledge for both study and Control Group at (pre-test and post-test).

The results of the present study agree with the results of the study of Taha et al, (2016), in Egypt at Zagazing University Hospital, which conducted that there was a non-significant association between the patient of the present program and absent program groups' knowledge at (pre-test and post-test) with their demographic characteristics at p-value more than 0.05.

5.15. Relationship between the Patients Self Care in (Study and Control Group) responses at the (pre-test and Post-test) Measurement with their Demographic Data:

Findings in **(Table4-34)**,**(Table4-35)**, **(Table4-36), and (Table4-37)** showed a non-significant association between the patients for (Study and Control Group) self-care at (pre-test and post-test) with their Demographic Data at P-value > 0.05. Those results might be because of the small size of the sample which is selected according to the design of the study.

The findings of the current study is insisted with the results of the study by Mersal. (2018) at Ain Shams University in Egypt which refers that there is a

non-significance association among the patient for the Control Group and study self-care at pre-test and post-test with demographic characteristics at P-value > 0.05. Adibe et al.(2009) mentioned that there was a non-significant relationship between monthly salary and knowledge regarding diabetes mellitus has been established.

While Jackson et al.(2014) disagreed with the finding of this study because they found that there were some significant associations. Jackson et al. said that "diabetes self-care knowledge was generally high among the target sample studied. Educational status, monthly income, duration of diabetes and negative attitude to disease condition predicted knowledge level".

5.16. Association between the Patient Knowledge and their Clinical Data for both study and Control Group :

Study results in (**Table4-38**),(**Table4-39**),(**Table4-40), and(Table4-41**) indicated that a non-significant association between the patients for Study and Control Group patient's Knowledge at (pre-test and post-test) with clinical status data at P-value > 0.05. The selection of small sample size and purposive sampling technique contributed to showing non-significant relationships, therefore the larger the sample, the more appropriate and satisfied once.

These results agree with the results of Mokabel et al. (2017) in Saudi Arabia who reported that there was a non-significant association between the patient's Knowledge (pre-and post-test) with their clinical data at a P-value > 0.05.

Despite the fact that Jackson et,al (2014) found in their study that there were some significant associations. According to the findings of the current study, both factors had a substantial relationship. Patients with a greater monthly income are more likely to succeed to afford their medications as well as glucose meters, blood pressure monitors, and other equipment required for optimal illness care.

5.17. Association between the patient self-care and their clinical data for both study and Control Group

Results in (**Tables 42, 43, 44, and 45)**   indicated that no-significance association among the patients (Control Group and Study group) self-care (pre-test and post-test) and with the clinical data at a P-value > 0.05.

The result is similar to the results of the study by Taha et al (2016) in Egypt at Zagazing University Hospital, which showed that there was a non-significant relationship between the patient self-care in the (pre-test and post-test) with their clinical data at a P-value more than 0.05.

However, Duration of diabetes was also found to be significantly associated with self-care knowledge. Similar findings have been recorded in a study by Priyanka et al., (2010) and Thompson et al., (2009) found that a negative attitude to disease conditions which affect knowledge levels about self-care in this study. Similarly, low perceived seriousness of diabetes (negative attitude) has been identified as a factor affecting knowledge of self-care. Such attitude may be an unconscious rejection of a threat or may reflect a lack of knowledge of the implications of diabetes for their health. Inappropriate health beliefs and attitudes concerning diabetes mellitus may make the patient uninterested in acquiring knowledge about the disease or the associated self-care.
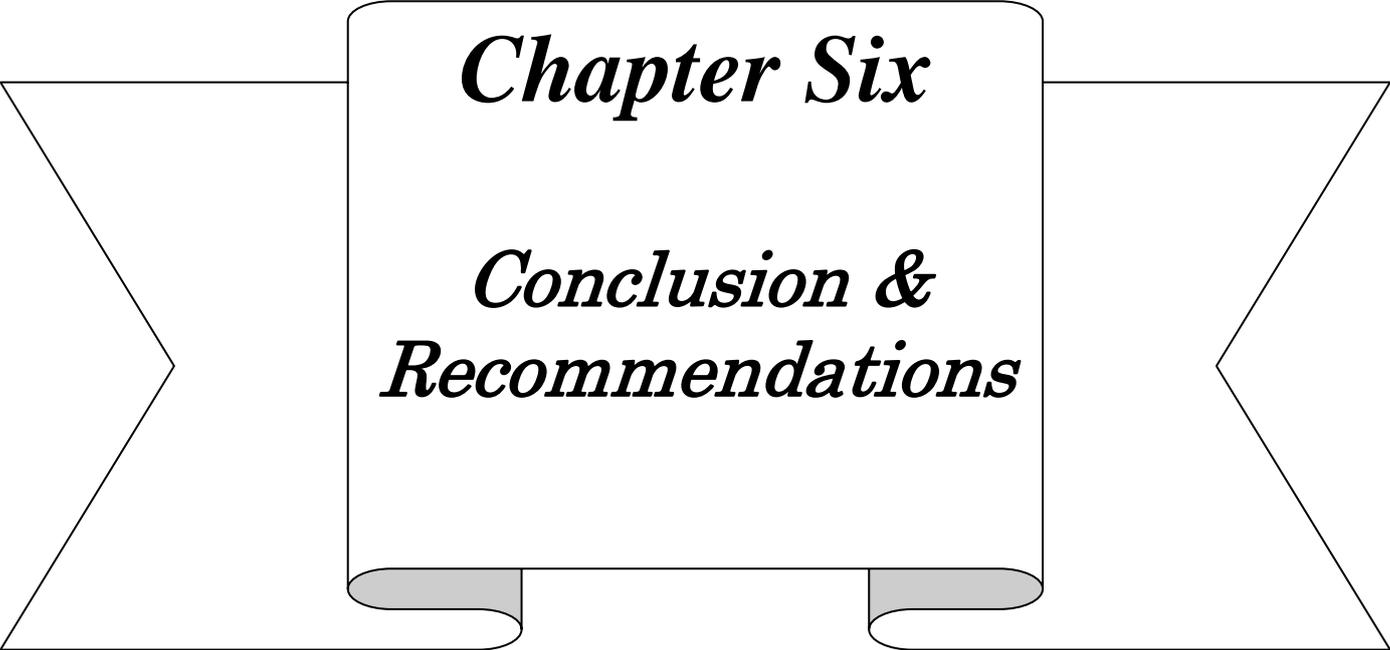
Chapter Six

Conclusion &
Recommendations

Chapter Six:

Conclusion and Recommendations

6.1. Conclusion:

Based on the results and their discussion, we arrived at the following conclusions:

6.1.1. There was a knowledge deficit among patients with diabetes mellitus.

6.1.2. Regarding self-care, patients suffer also from a shortage in their knowledge. between the study and control groups

6.1.3. Almost and throughout the pre-test assessment for both groups, the findings show no significant differences.

6.1.4. An improvement was noticed concerning the patient knowledge and self-care after the application of the educational program as after the post-test

6.2. Recommendations:

Based on the present study results, it is recommended that:

The Ministry of Health (MOH)

1. The Ministry of Health is called upon to assign more nurses to the diabetic centers, as they are members of the health care team with high quality of teaching and education.

2. Collaboration between MOH and Ministry of higher education will be effective to include some facts regarding the disease in the curriculum of schools and colleges.

3. More attention can be paid to planning and organizing a specific care to be given to diabetics within the center.

The diabetes centers

1. During the period of diagnosis of the disease, it will be crucial to start a strategy of providing those patients with all the information about the disease by the health care team.

2. It is very vital to teach patients who are registered and regularly visit the center about self-care activities.

3. Increase the use of mass media for educating the about the management of nursing care in all diabetic centers.

The Community

1. The governmental and non-governmental organizations can be used in increasing the awareness of the public in general about this risky and chronic illness.

2. Further studies can be conducted on larger sample to share more information and serve more people.

3. Further studies of diabetes mellitus should be conducted to enhance nurses' knowledge and to fill the gap between knowledge and practices regarding different aspects of teaching programmers. As well as determining the effectiveness of implementing teaching programs based on the knowledge of nurses working in the diabetes center.
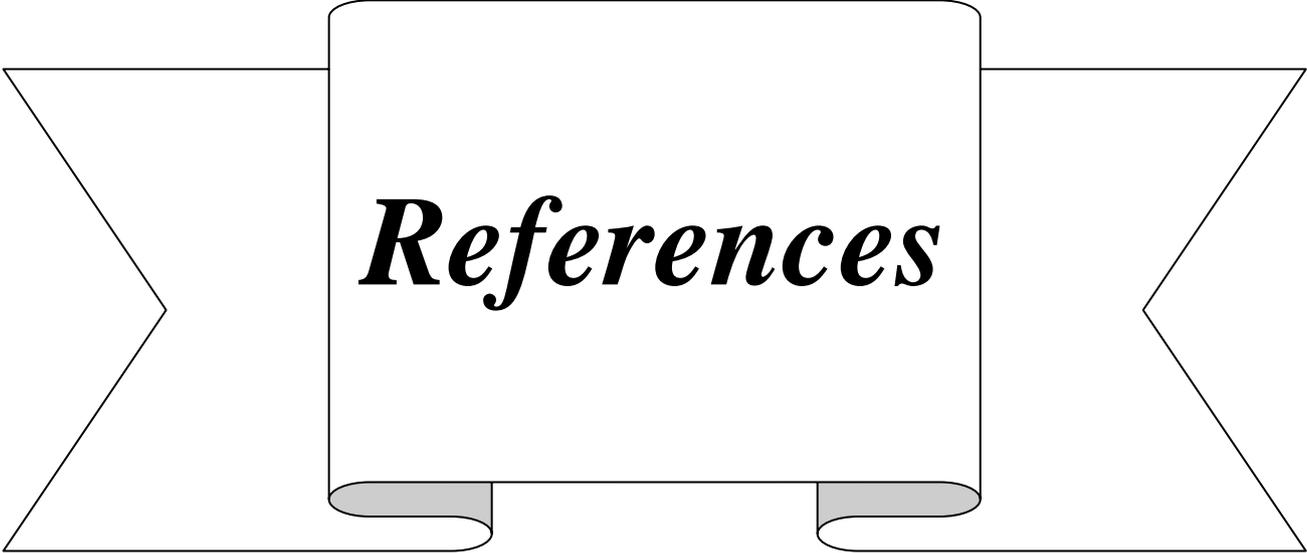
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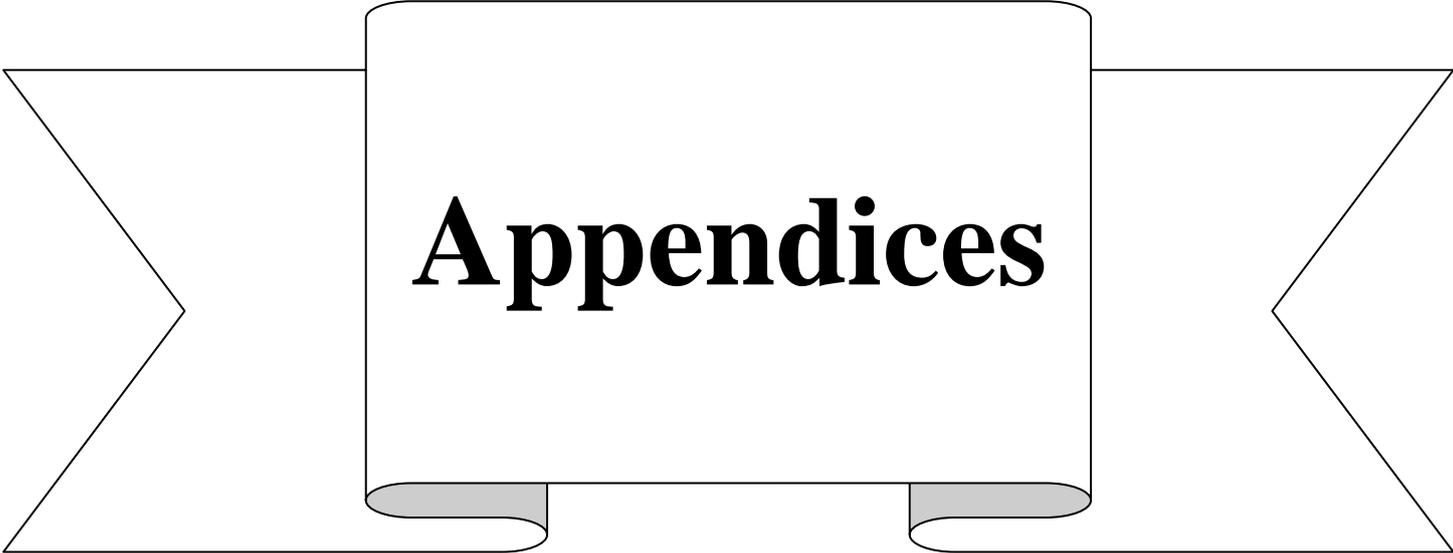
Appendices

Appendix A

Panel of Experts

خبراء تحكيم استمارة الاستبيان

ت	اسم الخبير	المرتبة العلمية	سنوات الخدمة	مكان العمل
1	د. آمين عجيل الياسري	استاذ	35 سنه	كلية التمريض/جامعة بابل
2	د.فخرية جبر محيبس	أستاذ	35سنة	كلية التمريض/جامعة بابل
3	د. محمد فاضل خليفة	استاذ	35 سنه	كلية التمريض/ جامعة بغداد
4	د. حسين جاسم محمد	أستاذ	29سنة	كلية التمريض/جامعة بابل
5	د. سعدية هادي حميدي	أستاذ	35 سنة	قسم التمريض /كلية المستقبل الجامعة
6	د. نهاد محمد الدوري	أستاذ مساعد	28سنة	كلية التمريض/جامعة بابل
7	د. ناجي ياسر سعد	أستاذ مساعد	30 سنه	كلية التمريض/جامعة بابل
8	د. ضياء كريم عبد	أستاذ مساعد	14سنة	كلية التمريض/جامعة الكوفة
9	د. مرتضى غانم عداي	أستاذ مساعد	15سنة	كلية التمريض/جامعة الكوفة
10	د. منصور عبدالله فالح	أستاذ مساعد	16سنة	كلية التمريض/جامعة الكوفة
10	د. علي حسين علوان	استشاري	30 سنه	مدير مركز السكري/دائرة صحة بابل
11	د. مهدي حمزه منذور	مدرس	17	معهد الصحة العالي/دائرة صحة بابل

Appendix B-1

Administrative Arrangements

University of Babylon
College of Nursing
Research Ethics Committee

جــامعة بـابـل
كـليـة التمريـض
لجنة اخلاقيات البحث العلمي

Issue No: 10

Date: 01 / 02 /2021

Approval Letter

To,

Salim Karim Hajwal

The Research Ethics committee at the (University of Babylon, College of Nursing) has reviewed and discussed your application to conduct the research study entitled (Effectiveness of an Educational Oriented Program upon Type II Diabetic Patients Knowledge and Self-Care Practices in Al-Hilla City).

The Following documents have been reviewed and approved:

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

Committee Decision.

The committee approves the study to be conducted in the presented form. The Research Ethics committee expects to be informed about any changes occurring during the study, any revision in the protocol and participant informed consent.
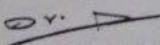
Prof. Dr. Salma K. Jehad
Chair Committee
College of Nursing
Research Ethical Committee
1 / 2 /2021

Appendix B-2

University of Babylon
College of Nursing
Research Ethics Committee

جـامـعة بـابـل
كـلية التمريض
لجنة اخلاقيات البحث العلمي

العدد والتاريخ: / /

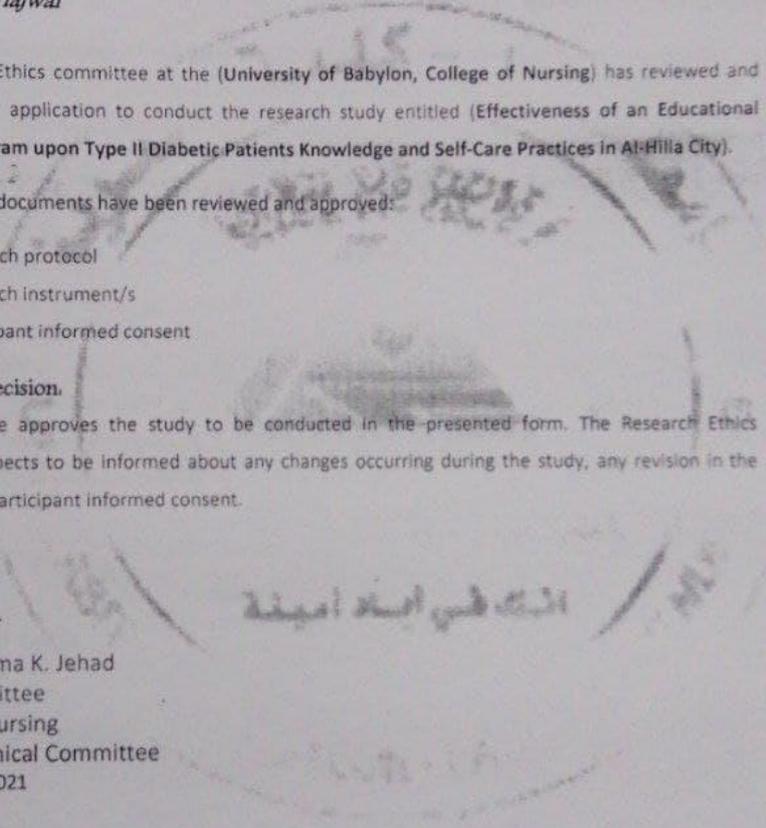|			
Compliance with therapy among hypertensive patients in Babylon hospitals	امتثال العلاج لمرضى ارتفاع ضغط الدم في مستشفيات بابل	أ.د. حسين جاسم الابراهيمي	حيدر عبد الحسين / ماجستير	6
Effectiveness of an Educational Oriented Program upon Type II Diabetic Patients Knowledge and Self-Care Practices in Al-Hilla City	فعالية برنامج تعليمي موجه في معرفة مرضى السكري النوع الثاني وممارسات الذاتيه في مدينه الحله	أ.د. سلمى كاظم جهاد	سالم كريم هجول / دكتوراه	7
Experience of motherhood and the psychological of teengers and adult: comparative study	تجربه الامومه والصحه النفسيه لدى الامهات المراهقات والبالغات : دراسه مقارنه	أ.م.د. حيدر حمزه علي	هيام عبد الرضا حسن / ماجستير	8
Assessment of Nurses Challenges regarding Health Care System in AL-Hilla City	تقييم تحديات الممرضين المتعلقة بنظام الرعاية الصحية في مدينة الحلة	أ.م.د. ناجي ياسر سعدون	زيد عبدالله حسين	9
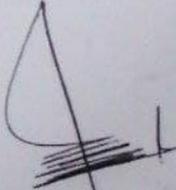
أ.م.د.حيدر حمزة علي
عضواً

أ.م.د.سحر ادهم علي
عضواً

أ.د.ندى خزعل كاظم
عضواً

أ.د. حسين جاسم محمد
عضواً
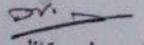
ا. د.سلمى كاظم جهاد
رئيس اللجنه

Appendix B-3

Ministry of Higher Education and Scientific Research

وزارة التعليم العالي والبحث العلمي

University of Babylon
College of Nursing

جامعة بابل
كلية التمريض
لجنة الدراسات العليا

Ref. No. :
Date: /

العدد : ٤٨٩
التاريخ : ١٤/ / ٢٠٢١

الى / دائرة صحة بابل / مركز التدريب والتطوير

م/ تسهيــــل مهمــــة

تحية طيبة :

يطيـــب لنـــا حســـن التواصــــل معكـــم ويرجـــى تفضــلكم بتســـهيل مهمـــة طالـــب الـــدكتوراه
(ســـالم كــريم هجـــول كـــاظم) لغــرض جمــع عينـــة دراســة الـــدكتوراه والخاصــة بالبحـث
الموسوم :

فعالية برنامج تعليمي موجه في معرفة مرضى السكري من النوع الثاني وممارسات الرعاية الذاتية في
مدينة الحلة

Effectivness of an Educational Oriented Program upon Type II Diabetic
Patients' Knowledge and Self- Care Practices in AL – Hilla City

مع الاحترام ...

ا.م.د. حسام عباس داود
العميد للشؤون العلمية والدراسات العليا
/ ٢٠٢١/٢

أ.م.د. ناجي ياسر سعدون
معاون العميد للشؤون العلمية والدراسات العليا وكالة
٢٠٢١/٢/١٤

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

E-mail:nursing@uobabylon.edu.iq

STARS

07711632208   وطني
009647711632208   المكتب

www.uobabylon.edu.iq

Appendix B-4

جمهورية العراق

وزارة الصحة والبيئة
دائرة صحة محافظة بابـــــل
المديـــر العـــام
مركز التدريب والتنمية البشرية
وحدة أدارة البحوث

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

العدد : ١٧٨

التاريخ:١٤/ ٧ / ٢٠٢١

الى / مستشفى الأمام الصادق (ع)
مستشفى مرجان التعليمي
م/ تسهيل مهمة

وزارة الصحة
دائرة صحة بابل
مركز التدريب والتنمية البشرية

السلام عليكم ...

أشارة إلى كتاب جامعة بابل / كلية التمريض / لجنة الدراسات العليا ذي العدد ٤٨٩
في ٢٠٢١/٢/١٤

نرفق لكم ربطا استمارات الموافقة المبدئية لمشروع البحث العائد للباحث طالب الدراسات
العليا / الدكتوراه(سالم كريم هجول كاظم)

للتفضل بالاطلاع وتسهيل مهمة المومى أليه من خلال توقيع وختم استمارات اجراء البحث
المرفقة في مؤسساتكم وحسب الضوابط والإمكانات لاستحصال الموافقة المبدئية ليتسنى لنا
أجراء اللازم على أن لا تتحمل مؤسساتكم أية تبعات مادية وقانونية .... مع الاحترام

المرفقات :
استمارة عدد /٢

مستشفى مرجان
للأمراض الباطنية والقلبية التخصصي
(الواردة)
العدد : ١٩٦٥
التاريخ ٢٠٢١/٧/١٤

الدكتور
محمد عبد الله عجرش
مدير مركز التدريب والتنمية البشرية
/ / ٢٠٢١

نسخة منه إلى :
• مركز التدريب والتنمية البشرية / وحدة أدارة البحوث مع الأوليات

Appendix B-5

جمهورية العراق

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

العدد : ١٧٨
التاريخ: ١٤ / ٧ / ٢٠٢١

إلى / مستشفى الأمام الصادق (ع)
مستشفى مرجان التعليمي
م/ تسهيل مهمة

السلام عليكم ...

أشارة إلى كتاب جامعة بابل / كلية التمريض / لجنة الدراسات العليا ذي العدد ٤٨٩ في ٢٠٢١/٢/١٤

نرفق لكم ربطا استمارات الموافقة المبدئية لمشروع البحث العائد للباحث طالب الدراسات العليا / الدكتوراه(سالم كريم هجول كاظم)

للتفضل بالاطلاع وتسهيل مهمة المومأ أليه من خلال توقيع وختم استمارات اجراء البحث المرفقة في مؤسساتكم وحسب الضوابط والإمكانات لاستحصال الموافقة المبدئية ليتسنى لنا أجراء اللازم على أن لا تتحمل مؤسساتكم أية تبعات مادية وقانونية .... مع الاحترام

المرفقات :
استمارة عدد /٢

الدكتور
محمد عبد الله عجرش
مدير مركز التدريب والتنمية البشرية
/ / ٢٠٢١

نسخة منه إلى :
• مركز التدريب والتنمية البشرية / وحدة أدارة البحوث مع الأوليات ...

Appendix B-6

Ministry of Health
Babil Health Directorate
Imam Sadiq General Hospital

جمهورية العراق

وزارة الصحة
دائرة صحة بابل
مستشفى الإمام الصادق (ع)
العدد /
التاريخ / / 2021

إلى /دائرة صحة بابل /مكتب المدير العام/مركز التدريب والتنمية البشرية

م/ عدم ممانعة

اشارة الى كتابكم المرقم 178 بتاريخ 2021/2/14 لامانع لدينا من تسهيل مهمة طالب الدراسات العليا/ الدكتوراه (سالم كريم هجول كاظم)، المنسوب الى كلية التمريض/ جامعة بابل قدر تعلق الامر بنا وحسب الضوابط على ان لاتتحمل مستشفانا أي تبعات مالية.
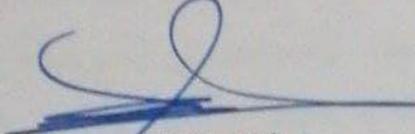
الدكتور الاختصاص

خالد فاهم نعمه الفتلاوي

مدير مستشفى الإمام الصادق (ع) التعليمي

2021 /2/ 4
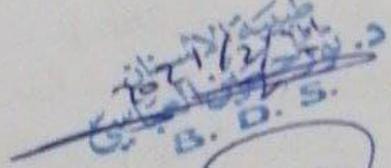
نسخة منه الى

• مكتب مدير المستشفى
• وحدة التدريب والبحوث
• الأرشيف/الادارية

الدكتور

مروان هشام عبد العزيز

معاون المدير للشؤون العلمية

م.و. مهندس فين
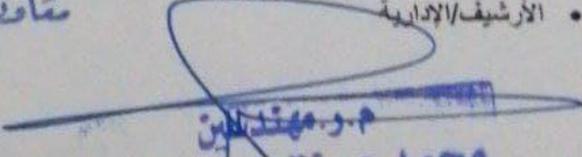
محمد عزة السلطاني

المعاون الاداري

Appendix B-7

جمهورية العـــراق

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

وزارة الصحة والبيئة
دائرة صحة محافظة بابـــل
المدير العـــام
مركــز التدريب والتنمية البشرية
لجنة البحوث

استمارة رقم
رقم القرار ١
تاريخ القرار ٢٠٢١/٤/٢٦

قرار لجنة البحوث

تحية طيبة ...

درست لجنة البحوث في دائرة صحة بابل مشروع البحث ذي الرقم ١ في ٢٠٢١/٤/٢٦ المعنونة (فعاليات برنامج تعليمي موجهة في معرفة مرضى السكري من النوع الثاني وممارسة الرعاية الذاتية في مدينة الحلة) والمقدم من الباحث (سالم كريم هجول كاظم) الى وحدة ادارة البحوث والمعرفي مركز التدريب والتنمية البشرية في دائرة صحة بابل بتاريخ ٢٠٢١/٤/٢٦ وقررت :

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

مـــــع الاحتـــرام

الدكتور / محمد عبد الله عجرش

رئيس لجنة البحوث
/ ٢٠٢١

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

Appendix C

استمارة الاستبيان

(فاعلية برنامج تعليمي موجه في معرفة مرضى السكري من النوع الثاني وممارسات الرعاية الذاتية في مدينة الحلة)

الجزء الأول: معلومات اجتماعية وديموغرافية:

1. العمر: ☐ سنة

2. الجنس: ذكر ☐ أنثى ☐

3. المستوى الدراسي:

لا يقرأ ولا يكتب ☐   يقرأ ويكتب ☐

ابتدائية ☐   متوسطة إعدادية ☐

المعهد وما فوق ☐

4. الحالة الاجتماعية

الحالة الزوجية: اعزب ☐ متزوج ☐ مطلق ☐ أرمل ☐ منفصل ☐

نوع الأسرة: محدودة ☐   غير محدودة ☐

العمل: يعمل ☐   لا يعمل ☐   متقاعد ☐   ربت بيت ☐

السكن: حضري ☐   ريفي ☐

5. الحالة الاقتصادية:

يكفي ☐   يكفي إلى حد ما ☐   غير كافي ☐

6. معلومات سريرية

الطول ☐ م   الوزن ☐ كغم

التدخين: لم يدخن مطلقاً ☐   مدخن سابق ☐   مدخن ☐

حساسية الطعام: نعم ☐   لا ☐

الإصابة بالسكري في العائلة: نعم ☐   لا ☐

مدة المرض: ☐ سنه

الجزء الثاني:
معارف المريض بالمرض ومضاعفاته:

لا أعرف	غير متأكد	أعرف	فقرة المعارف العامة	ت
			السكري مرض خطر	1.
			يمكن علاج السكري	2.
			السكري هو نقص الأنسولين الفعَال في الجسم	3.
			السكري مرض وراثي	4.
			يعني السكري أن معدل الغلوكوز (السكر في الدم) مرتفع	5.
			البنكرياس يفرز الأنسولين	6.
			معدل سكر الدم الصومى يتراوح بين 80 إلى 120	7.
			مرض السكري النمط الثاني لا يعتمد على الأنسولين	8.
			من علامات ارتفاع معدل السكر في الدم هي الارتجاف	9.
			من علامات ارتفاع معدل السكر في الدم هي التعرق	10.
			من علامات ارتفاع معدل السكر في الدم هي التغيرات السلوكية	11.
			من علامات ارتفاع معدل السكر في الدم هي الاضطراب	12.
			التبول المتكرر والشعور بالعطش من علامات انخفاض معدل السكر في الدم	13.
			يمكن للسكري أن يغير العلاقة الجنسية	14.
			يمكن للسكري أن يُضر العينين	15.
			يمكن للسكري أن يُضر بالكليتين	16.
			يمكن للسكري أن يحدث تغيرات بالوزن	17.
			من الجيد أن تشعر بأنك بصحة جيدة بشكل عام	18.
			معدل السكر في الدم الغير طبيعي يسبب القلق للفرد	19.
			عادةً ما يسبب السكر اضطرابات في دوران الدم	20.

معارف المرضي حول ممارسات الرعاية الذاتية

الجزء الأول

فقرة نوع الغذاء

لا أعرف	غير متأكد	أعرف	الفقرة	ت
			آكل من 175 إلى 250 غم من الكربوهيدرات (خبز ورز بشكل أساس) في اليوم	1.
			أتناول وجبة واحدة من البطاطا على الأقل يومياً	2.
			عصير الفاكهة غير المحلى مناسب للحالة	3.
			أتناول الخضروات والفواكه ذات الألياف مثل(التفاح)	4.
			طعامي لا يحتوي على نسبة دهون عالية	5.
			الوجبات التي أتناولها متعددة وصغيرة تصل إلى خمسة	6.

				وجبات	
				من المهم قراءة وأستخدم نشرات الأطعمة دليلاً غذائياً	7.
				أتناول أدوية السكر على شكل حبوب	8.
				أتناول الفيتامينات والمكملات الغذائية المسموح بها بدون وصفة طبية	9.
				أتناول بعض الأدوية المسموح بها بدون وصفة طبية	10.

				الجزء الثاني	
				فقرة التمارين الرياضية	
لا أعرف	غير متأكد	أعرف	**الفقرة**		ت
			أركب الدراجة (بما فيها الدراجة الثابتة) لمدة عشرة دقائق		1.
			أقوم بحمل أو رفع الأشياء الثقيلة أو الحفر و البناء لمدة عشرة دقائق		2.
			أمارس نشاطات بدنية أخرى مثل السفر والتسوق		3.
			التقليل من استخدام المصعد		4.
			التقليل من استخدام السيارة		5.
			أمارس نشاطات رياضية (ترفيهية) لمدة عشرة دقائق		6.
			أمارس نشاطات رياضية أو رشاقة أخرى مثل المشي والسباحة		7.
				الجزء الثالث	
				فقرة العناية بالقدمين	
لا أعرف	غير متأكد	أعرف	**الفقرة**		ت
			أغسل قدمي كل يوم		1.
			أجفف ما بين أصابع قدمي		2.
			أستخدم كريم مرطب لقدمي		3.
			أراقب باطن قدمي		4.
			أتأكد من درجة حرارة الماء دائماً قبل أن أضع قدميَّ فيه		5.
			للعناية بالقدمين والجروح، من المهم تنظيف الجرح باليود والكحول		6.
			أحذر عند قص أظافر ارجلي		7.
			الأحذية والجوارب الضيقة مضرة بالمريض بالسكري		8.
				الجزء الرابع	
				فقرات عناية أخرى	
لا أعرف	غير متأكد	أعرف	**الفقرة**		ت
			اجري فحص معدل السكر في الدم صباحاً قبل		1.

			الإفطار	
			يتوفر لدي جهاز قياس معدل السكر في البيت	2.
			الدواء هو أكثر أهمية من النظام الغذائي.	3.
			الدواء هو أكثر أهمية من الرياضة للسيطرة على مرض السكري	4.
			الحفاظ على المواعيد وزيارة مرافق الرعاية الصحية لمتابعة مرضي و لتثقيف الصحي.	5.

Appendix C

Questionnaire

(Effectiveness of an Oriented Educational Program upon Type II Diabetic Patients' Knowledge and Self-Care Practices in Al-Hilla city).

Part I: Socio-demographic characteristics:

1-Age ☐

2- Gender: Male ☐ Female ☐

3-*Level of Education:*

-Unable to read and write ☐ Read and write ☐

Primary School Graduate ☐ Secondary School Graduate ☐ Institute and above ☐

4- Social Status:

Marital Status: ☐ Single ☐ Married ☐ Divorced ☐ Widowed

Separated ☐

Family type: nuclear ☐ extend ☐

Occupation: Employ ☐ unemployed ☐ Retired ☐ House wife ☐

Residence: Urban ☐ Rural ☐

5 -Economic Status:

Enough ☐ enough to some extent ☐ not enough ☐

6-Clinical data:

Height ☐ Cm　　　Weight ☐ Kg

Smoking status. Never smoke ☐　EX-smoker ☐　smoker ☐
second hand smoker ☐

Any history of food allergy.　Yes ☐ no ☐

Family history of Diabetes mellitus: Yes ☐ / no ☐

Duration of disease. ☐ Years

Part II : Patient's knowledge about the disease and its complications.

A	Items of knowledge are general	I know	Uncertain	Don't know
1	Diabetes is a serious disease			
2	Diabetes can be cured			
3	diabetes is the lack of effective insulin in the body			
4	Diabetes is a hereditary disease			
5	Diabetes means that glucose(blood sugar)is too high			
6	Panaceas produce insulin			
7	A fasting blood sugar level is about (80-120)			
8	Type II is non-insulin-dependent			
9	Shaking is a sign of high blood sugar			
10	Confusion is a sign of high blood sugar			
11	Sweating is a sign of high blood sugar			
12	behavioral change is a sign of high blood sugar			
13	Frequent urination and thirst are signs of low blood sugar			
14	Diabetes can damage the kidneys			
15	Diabetes can damage the eyes			
16	Diabetes can affect the sexual function			
17	Diabetes can cause weight changes			
18	It is good to feel well as general			
19	blood sugar causes worry for individual			
20	Diabetes often causes poor circulation			

B	Items of Self - Care Practices			
	Domain 1			
	Diet	**I know**	**Uncertain**	**Don't know**
1	Eat from 175-250 grams of carbohydrate (including mostly, bread and rice |per day			
2	I take at least one potato meal daily			
3	Unsweetened fruit juice is appropriate for the condition			
4	My diet should be less fatty			
5	My diet includes dietary fiber .vegetables and fruits like apple			
6	Meals must be small and multiple(5)meal			
7	Taking any over the counter medication			
8	Taking any over counter vitamins, or supplements			
9	It is important to read and use food labels as a dietary guide			
10	Taking diabetes medications. Diabetes pills			
	Domain 2			
	Exercise			
1	Bicycling (including stationary exercise bike)10 mint			
2	Engaging in carrying or lifting heavy loads digging or constructing work for (10) mint			
3	Engaging in other physical activities like traveling and shopping			
4	Engaging in other sports and fitness (leisure) for 10 mints			
5	Preforming other sports and fatness such as walking and swimming			
6	Reducing driving			
7	Reducing lift using			

	Domain 3			
	Foot Care			
1	Wash the feet every day			
2	Drying up between toes			
3	Using moistening cream on feet			
4	I reach and see the bottoms of my feet			
5	Always test the water temperature before putting the foot in it			
6	For Footcare and injury, it is important to clean a cut with iodine and alcohol			
7	Diabetics take extra care when cutting their toenails.			
8	Tight elastic shoes or socks are bad for diabetics.			
	Domain 4			
	General information about self-care			
1	Blood sugar must be cheek early morning before breakfast			
2	A glucose meter must be available at home			
3	Medication is more important than diet.			
4	Medication is more important than exercise to control my diabetes.			
5	Keep on appointments and visit the health care facility for follow-up and exposure to health education			

Appendix (D)

وزارة التعليم العالي و البحث العلمي

جامعة بابل/ كلية التمريض

(Effectiveness of an Educational Oriented Program upon Type II Diabetic Patients' Knowledge and Self-Care Practices in AL-Hilla City)

أعداد طالب الدكتوراه

سالم كريم هجول

إشراف/ الأستاذ

د. سلمى كاظم جهاد

فاعلية البرنامج التعليمي الموجه في معرفة مرضى السكري من النوع الثاني وممارسات الرعاية الذاتية في مدينة الحلة

الهدف من البرنامج

يهدف البرنامج إلى تطوير معارف المصابين نحو مرض السكري وتعزيز ممارساتهم في العناية الذاتية

المقدمة

يعتبر داء السكري من أكثر التحديات الصحية التي تواجه عالمنا الحديث في القرن الواحد والعشرين، حيث اصبح ينتشر كوباء يهدد جميع الدول والشعوب والأعراق والفئات الاجتماعية على حد سواء، حاملًا معه مضاعفات أشد خطورة منه مثل المضاعفات القلبية والوعائية والاعتلال العصبي والشبكي والكلوي السكري وإصابات القدم السكرية والتي قد تؤدي بدورها إلى الوفاة المبكرة أو بتر القدم أو العجز الحقيقي.وتقدر الإحصاءات الدولية لمنظمة الصحة العالمية والاتحاد الدولي للسكر بأن عدد المصابين بهذا المرض في العالم في عام 2014 قد وصل إلى 370 مليونا ، بينما كان عدد المصابين في عام 2010 يناهز 285 مليوناً من أصل 7 مليارات وهم سكان كوكب الأرض في العام المذكور، ويتوقع ان يرتفع هذا العدد أكثر من 438 مليوناً بكثير من كافة الفئات العمرية من أصل 8,4 مليارًا وهم سكان الأرض مع حلول عام 2030 ، أي بنسبة% 7,8 من مجموع سكان العالم ، مع وجود دراسات تشير إلى حدوث وفاة واحدة في العالم

كل عشر ثوان ناجمة عن المضاعفات السكرية ، مما يشير إلى الخطورة المتصاعدة لانتشار هذا المرض وزيادة الأعباء الاقتصادية المترتبة على ذلك على الفرد والمجتمع، فضلًا عن ضعف إنتاجية الفرد المصاب.

وانخفاض متوافقا لدراسات منظمة الصحة العالمية، فإن حوالي 80 % من الوفيات الناجمة عن السكري تحدث في البلدان محدودة الدخل، وأن نصف هذا العدد من ذوي الأعمار دون السبعين عاماً (وهو العمر المتفق عليه لسن الشيخوخة وفق تصنيفات الفئات العمرية) ومن المتفق عليه علمياً وتجريبياً أن الالتزام بتناول الطعام الصحي وممارسة النشاط الرياضي البدني بانتظام، والمحافظة على وزن مناسب ، والامتناع عن التدخين وتعاطي التبغ بكافة أشكاله، والتحكم بالقلق والتوتر، كل ذلك يساعد على منع أو تأخير ظهور السكري الشائع المسمى(السكري من النمط الثاني Diabetes mellitus type II) وسط العمر الافتراضي.

History of diabetes   لمحة تاريخية عن مرض السكري

مرض السكر:معروف منذ القدم وكان يعتبر من الأمراض القاتلة حيث أن مريض السكر لا يعيش أكثر من سنتين بعد ظهور المرض لاسيما في صغار السن حيث أنه كان يعالج بطرق بدائية .ولكن المعرفة الحقيقية لأسباب المرض وطرق علاجه بدأت في النصف الأول من القرن العشرين منذ اكتشاف الأنسولين سنة 1921 م والعلاج بالأقراص المخفضة لسكر الدم. في عام 1922م تم علاج أول مريض بالأنسولين وأسمه ليونارد وكان في الثانية عشر من عمره وعاش بعدها سنوات طويلة.

يطلق على مرض السكر (ديابيتس ميلليتس Diabetes mellitus) وهي تسمية لاتينية ترجع إلى ما قبل الميلاد حيث أطلقها الرومان لوصف هذا المرض لأول مرة تعني كلمة (ديابيتس) الماء الجاري إشارة إلى كثرة التبول بكميات كبيرة أما معنى كلمة (ميلليتس) تعني العسل إشارة إلى مرور السكر مع البول. عندما يتم تشخص المرض لأول مرة بمرض السكري سيكون لديك أسئلة كثيرة ويصبح عندك شعور بالغموض نحو هذا المرض ولكن هناك من يساعدك كثيرا أنك لست وحدك تعاني من هذا المرض ولكن عدة ملايين من الناس يعانون من مثل هذا الداء ومعظم هؤلاء الناس يعيشون حياة طبيعية وعادية ولكن الشيء الممتاز أنك تحاول أن تعرف كل شيء عن داء السكري .وهذا الدليل سوف يعطيك بعض المعلومات الأساسية عن هذا المرض. مرض السكر من الأمراض المزمنة والمعقدة التي تصيب عدداً كبيراً من الناس .حيث تشير الإحصاءات الحالية إلى وجود أكثر من 280 مليون مصاب بمرض السكر في العالم وستزيد هذه النسبة إلى 340مليون في عام 2030 ميلادية يعيش 80 % منهم في الدول النامية كجزء من هذا العالم عرضة لهذا الزيادة في نسبة الإصابة بمرض السكر فقد زادت نسبة الإصابة من 2.5 % في عام 1982إلى حوالي 17 % في عام 2010 م وفي عام 2014 وصلت النسبة إلى 24% تقريباً ممن هم فوق سن 30 من السكان.

دور التعليم والتدريب في علاج داء السكري:

يحتاج الأشخاص المصابون بمرض السكري إلى قدر عالي من التكيف في جميع أوجه الحياة فالسكري مرض مزمن سيرافق المريض طوال حياته مما قد يؤثر على الجوانب الصحية والنفسية والاجتماعية والاقتصادية للفرد والأسرة. ويتطلب مرض السكري دوراً قيادياً ومشاركة فعالة من جانب المريض والأسرة حتى تتحقق عملية التعايش بدون خوف أو قلق من المشاكل والمضاعفات. وفي تقرير لمنظمة الصحة العالمية صدر عام 1985 أظهر أن التعليم والتدريب والتثقيف من خلال 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.

وقد ذكر بارتليت عام 1988 أن التعليم الصحي لمرضى السكري يحقق التالي:

1. يقلل من الحزن والقلق الناشئ عن المرض ومضاعفاته.

2. يزيد مستوى الرضا والقبول بالخدمات المقدمة لمرضى السكري.

3. يقلل من عدد مرات الدخول للمستشفى ويقصر الإقامة بها.

ويعتمد نجاح البرامج التعليمية على عدة عوامل أهمها:

1. توفير احتياجات المرضى.

2. تنمية المشاركة الفعالة من قبل المرضى.

3. مرونة البرامج وقابليتها للتعديل والتغيير.

4. استعمال الوسائل والتقنيات التعليمية المناسبة.

5. توفر إدارات تتبنى التطوير والتحديث وإطلاق المهارات والخبرات.

١ ـ المحاضرة الاولى:

أعلنت وزارة الصحة الاتحادية عن ارتفاع نسبة المصابين بالسكري في العراق إلى 13% للأعمار من 19 عام فما فوق، مبينة ان 52% منهم لا يعلمون بأنهم مصابون بهذا المرض

ما هو داء السكري: What is diabetes mellitus

مرض السكري هو مرض استقلابي مزمن يتظاهر 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.

ما هو الأنسولين: الأنسولين هو هرمون يُفرز من خلايا بيتا في مجموعات خلوية بالبنكرياس تسمى جزر لانكرهانس ويتكون من سلسلتين من الاحماض الأمينية ترتبطان بروابط كيميائية ببتيدية تسمى ببتيد سي C- Peptide حتى يصبح فعالا ويمر في الكبد أولاً بعد إفرازه، حيث يُستهلك 60 – 50 % منه لوظائف الكبد كونه المصنع الأول في الجسم .والأنسولين ضروري للجسم كي تمكن من الاستفادة واستخدام الطاقة المخزونة في الطعام على شكل سكريات بالدرجة الأولى، ومن البروتينات والدهون أيضاً.

ما هي مرحلة ما قبل السكري؟ ?What is pre-diabetes

عرف ما قبل السكري بالحالة التي تكون فيها معدلات السكر في الدم أعلى من الطبيعي وأقل من المعدل التشخيصي لمرض السكري .90 ـ 95 ٪ من المصابين بهذه الحالة يتم تشخيصهم في وقت لاحق بالنوع الثاني الفحص العشوائي لتحديد المصابين بما قبل السكري هي استراتيجية مجدية لاكتشاف الأشخاص المعرضين للإصابة بالنوع الثاني من داء السكري .ولتفادي حصول ذلك، يقوم الفريق الطبي بتحديد خطة علاجية تتضمن تخفيف الوزن، نظام غذائي صحي وممارسة الرياضة. تشخيص وعلاج حالة ما قبل السكري تقلل من خطر الإصابة بمضاعفات السكري التي تبدأ في هذه المرحلة المبكرة .من داء السكري

ما هي أ سباب مرحلة ما قبل السكر ?What are the causes of pre-diabetes

ليس هناك سبب معين لحالة ما قبل السكري(كما في النوع الثاني للسكري)، ولكن مجموعة

من العوامل المصاحبة بخطر الإصابة بذلك وهي:

•التاريخ العائلي للسكري.

•زيادة الوزن والسمنة.

•ارتفاع ضغط الدم.

•ارتفاع مستوى الكولسترول والدهون الثلاثية في الدم.

- بعض الإصابات الفيروسية.الإصابة بسكر الحمل بالنسبة للمرأة.بعض العمليات الجراحية.

- عدم ممارسة الرياضة وقلة الحركة

- قلة المناعة والأمراض المناعية المختلفة

صورة رقم (1) يوضح السمنة وقياس محيط الجسم

مرض السكري نوع 2   Type 2 Diabetes

حلت تسمية السكري من النوع الثاني (Type 2 Diabetes) محل تسميات عديدة سابقة له منها : سكري الكبار أو سكري البالغين، والسكري المرتبط بالسمنة، والسكري غير المعتمد على الأنسولين. وينجم السكري من النوع الثاني عن واحدة أو مجموعة من عمليات فيزيولوجية. مرضية.

يتطور هذا النوع عندما يكون بإمكان الجسم إنتاج بعض الأنسولين، لكن ليس بما فيه الكفاية، أو عندما يكون الأنسولين الذي يتم إنتاجه لا يعمل بشكل صحيح، المعروف باسم مقاومة الأنسولين"insulin resistance" ؛ في معظم الحالات يرتبط هذا النوع من المرض بزيادة الوزن. وعادة ما يظهر هذا النوع من السكري عند الأشخاص فوق سن الأربعين. ومع ذلك، في الآونة الأخيرة، يجرى تشخيص الكثير من الأطفال الذين يعانون من هذه الحالة، بعضهم لا يتجاوز عمره سبع سنوات. السكري من النوع ٢ هو أكثر شيوعا" من النوع ١ إذ يشكل ٩٠% من الأشخاص الذين يعانون من مرض السكري بينما يشكل النوع الأول 10%.

يتميز باختلافه عن النمط الأول من حيث وجود مقاومة مضادة لمفعول الأنسولين بالإضافة إلى قلة إفراز الأنسولين .ولا تستجيب مستقبلات الأنسولين الموجودة في الأغلفة الخلوية لمختلف أنسجة الجسم بصورة صحيحة للأنسولين. المراحل الأولى تكون مقاومة الأنسولين هي الشذوذ الطاغي في استجابة الأنسجة للأنسولين و مصحوبة بارتفاع مستويات أنسولين في الدم . وفي هذه المرحلة يمكن تقليل مستوى غلوكوز الدم عن طريق وسائل و أدوية تزيد من فاعلية الأنسولين و تقلل إنتاج الگلوكوز من الكبد . وكلما تطور المرض تقل كفاءة إفراز الأنسولين من البنكرياس وتصبح هناك حاجة لحقن الأنسولين.

كان هذا النمط يصنف سابقاً على أنه الداء السكري غير المعتمد على الأنسولين. يصيب هذا النمط الأشخاص الذين يبدون مقاومة للأنسولين أو نقصاً نسبياً في إفرازه، ويُصنف في 80 إلى 90% من المصابين بالداء السكري. والمصابون عادة هم من كبار السن الذين تزيد أعمارهم على 40

سنة ولديهم درجات مختلفة من السمنة، ولا يحتاجون للأنسولين للبقاء على قيد الحياة، ولكن قدرتهم على إفرازه تتدهور مع مرور الزمن. وقد يحتاج هؤلاء إلى العلاج بالأنسولين للوصول إلى الضبط الجيد لمستوى سكر الدم، ولا يصاب المرضى بهذا النمط بالأحماض الخلوية ketoacidosis السكري إلا نادراً، ويكون ذلك بعد خمج أو رض شديد. وما زالت طبيعة الخلل الأولي في الداء السكري نمط 2 غامضة

الأعراض والعلامات: Symptoms and signs

ويمكن أن يستمر النمط الثاني بدون ملاحظة المريض لفترة طويلة بسبب ضعف ظهور الأعراض أو بسبب عدم وضوحها أو اعتبارها مجرد حالات فردية عابرة لا توحي بوجود مرض. وعادة لا يعاني المريض من الحماض الكيتونية. و لكن يمكن أن تنتج مضاعفات خطيرة من عدم ملاحظة المرض مثل القصور الكلوي الناتج عن اعتلال الكلى السكري أو مرض وعائي (مثل مرض في الشريان التاجي أو مرض في العين ناتج عن اعتلال الشبكية السكري أو فقد الإحساس بالألم بسبب اعتلال الأعصاب السكري أو تلف الكبد ناتج عن التهاب كبدي دهني لا كحولي) أي أن سببه ليس مشروبات كحولية كما يحدث في العادة.

يجب مراقبة الأشخاص الذين يحملون عدة عوامل خطورة بشكل وثيق، فإحدى الحقائق المثيرة حول داء السكري أنه من الممكن أن يتظاهر أحياناً بأعراض غير محددة أو حتى بدون أعراض نهائياً، مما يجعله مرضاً خطيراً حيث يمكن أن يحدث لسنوات عدة بدون أن يكشف مسبباً الكثير من الاختلاطات قبل أن يشخص.

لكن هناك أعراض يجب أن تنذر الناس إلى تشخيص سكري النمط الثاني وتشمل:

- التبول المفرط والعطش الزائد.

  - حدوث نقص وزن إذا كانت مستويات الغلوكوز الدم عالية جداً.

- الشعور بالتعب والإرهاق شائع جداً في حال كان مستوى جلوكوز الدم عالي، وقد يصبح المريض عرضة لظهور أعراض الجفاف مثل التشنجات.

- من الممكن الإحساس بالرؤية المشوشة، لكنها عادة تكون ظاهرة مؤقتة وليست ذات علاقة في تشخيص حدوث تغييرات سكرية دائمة. ويجب أن يتفادى المرضى الحصول على النظارات الجديدة في هذه المرحلة المبكرة.

- قد يعاني مرضى المستويات المرتفعة من الغلوكوز من حس وخز أحياناً في القدمين أو الأطراف السفلية، وقد يكون ذلك مزعج جداً، لكن أيضاً فإن هذا الشعور محدد لذاته ويزول عفوياً.

- يكون مرضى السكري أكثر عرضة لإصابات الخمائر مثلاً : في المهبل وتحت الثديين، وحول القضيب وأحيانا في الفم. وتكون الإصابات على الجلد عادة أبطأ في الشفاء.

  - يمكن حدوث دمامل أو جمرات في حال المستويات المرتفعة من جلوكوز الدم

• إن وجود أي من هذه الأعراض يجب أن تتذكر للتوجه إلى طبيبك لعلاج داء السكري، وبالإمكان عادة بسهولة بالغة من خلال إجراء فحص دموي بسيط.

2- المحاضرةالثانية

الأسباب

وجد العديد من النظريات التي تحاول تحديد سبب وآلية الإصابة بالنمط الثاني من السكري. الدهون التي تتركز حول الوسط على الأعضاء داخل البطن وليس الدهون تحت الجلد تؤدي إلى مقاومة الأنسولين. و تنشط الدهون هرمونياً وتفرز مجموعة من الهرمونات التي تقلل من فاعلية الأنسولين. ويعاني من السمنة 55 % من المرضى المصابين بـالنمط الثاني من السكري .و توجد عوامل أخرى مثل التقدم بالعمر (حوالي 20 % من المسنين يعانون من البول السكري كما في أمريكا الشمالية) و تاريخ العائلة . النمط الثاني يزداد في الأفراد الذين لديهم أقارب عانوا منه سابقاً. وقد بدأ النمط الثاني بإصابة الأطفال و المراهقين يرجع ذلك إلى انتشار سمنة الأطفال في بعض الأماكن في العالم.

لوحظ وجود نقص في حساسية الأنسجة للأنسولين عند معظم المرضى المصابين، بغض النظر عن وزنهم، ويعزى ذلك إلى عدد من العوامل المتداخلة تتضمن استعداداً وراثياً غير محدد الطبيعة، تتفاقم مع تقدم العمر، ونقص النشاط الفيزيائي، والبدانة الحوشية البطنية. يضاف إلى ما سبق نقص في استجابة خلايا بيتا للتحريض بالجلوكوز، وهذا اضطراب وراثي يتفاقم على نحو تدريجي بترسب المادة النشوية الإميلويد amyloid داخل جزر لنغرهانس مع تقدم العمر. كما أن مقاومة النسج للأنسولين، وكذلك استجابة خلايا بيتا للتحريض بالغلوكوز تزدادان سوءاً باستمرار ارتفاع سكر الدم.

الفسيولوجيا المرضية :يمكن حالياً تمييز فئتين من المصابين بالداء السكري نمط 2 تتميز الواحدة من الأخرى بوجود السمنة أو غيابها:

داء السكري النمط 2 المترافق بالسمنة

تشاهد السمنة عند 60 - 80% من المصابين بهذا النمط من الداء السكري. ويتصف هؤلاء المرضى بوجود درجة من مقاومة الأنسولين تتناسب مع درجة البدانة الحوشية البنية historical background of diabetes mellitus.

إن الخلايا الدهنية المنتفخة، والعضلات والكبد المفرطة التغذية، تقاوم تأثير الأنسولين كما تقاوم خزن المزيد من الكلايكوجين والدسم، وكثيراً ما يلاحظ عند هؤلاء وجود فرط تصنع خلايا بيتا.وفي الحالات الأكثر شدة من ارتفاع سكر الدم يظهر فشل خلايا بيتا في إفراز الأنسولين، ولكن هذا الفشل قد يتراجع إذا تم ضبط مستويات السكر بالعلاج المناسب.

داء السكري النمط الثاني غير المترافق بالسمنة

يؤلف هؤلاء المرضى من20 ___ 40% من مجموع المرضى المصابين بالسكري، ويشكل الخلل في إفراز الأنسولين السبب الرئيس للإصابة.

يبدأ علاج النمط الثاني بشكل عام عادة عن طريق زيادة النشاط البدني و تقليل تناول النشويات وتقليل الوزن. و يمكن لهذه الإجراءات أن تستعيد فاعلية الأنسولين حتى لو كان فقد الوزن قليلاً (5 كيلوغرامات على سبيل المثال) لاسيما لو كان من منطقة الكرش و يمكن في بعض الحالات التحكم في مستوى كلوكوز الدم بصورة جيدة بواسطة هذه الإجراءات فقط و لفترة طويلة و لكن ميل الجسم لمقاومة الأنسولين لا ينتهي و لذلك يجب الانتباه إلى مواصلة النشاط البدني وفقد الوزن والحفاظ على نظام غذائي مناسب للمرض. وتكون الخطوة التالية من العلاج عادة هي تناول الأقراص المخفضة للسكر. ويضعف إنتاج الأنسولين إلى حد ما في بداية النمط الثاني من السكري و لذلك يمكن تعاطي دواء عن طريق الفم (يُستعمل في العديد من الوصفات الطبية التي تحتوي على مجموعة من الأدوية)(لتحسين إنتاج الأنسولين عائلة السلفونيل يوريا) أو لتنظيم الإفراز غير المناسب للغلوكوز من الكبد ولإضعاف مقاومة الأنسولين إلى حد ما(الميتفورمين) أو لإضعاف مقاومة الأنسولين بصورة كبيرة (مثل الثيازوليديندويونات).(. و قد وجدت إحدى الدراسات أن بمقارنة المرضى البدناء الذين يتعاطون الميتفورمين بأولئك الذين يعتمدون على ضبط النظام الغذائي فقط فإن تعاطي الميتفورمين يقلل احتمال إصابة بمضاعفات خطيرة بنسبة 32% و يقل احتمال الموت بسبب مرض البول السكري بنسبة 42% بل وتقل لديهم احتمال الوفاة أو الإصابة بالسكتة الدماغية لأي سبب بنسبة 36 . %و يمكن للدواء الفموي أن يفشل في النهاية بسبب الضعف المتواصل لإفراز الأنسولين من الخلايا بيتا وعند الوصول لهذه المرحلة يجب تعاطي حقن الأنسولين للتحكم في گلوكوز الدم.

الأغذية والفواكه التي تساعد على نزول داء السكر النوع الثاني

✔ الفاصولياء: تعتبر اختياراً رائعاً لتغذية مرضى السكري، إذ تساعد في ضبط مستوى السكر في الدم، كما يخفض خطر الإصابة بأمراض القلب. تعتبر الفاصوليا السوداء، الفاصوليا البيضاء، فول الصويا واللوبياء إضافات مفيدة لوجبات مرضى السكري. الفاصولياء مصدر غني بالبروتين للمصابين بالسكري، بالإضافة لاحتوائها على كميات كبيرة من فيتامين أ. كما تحتوي على كمية وفيرة من الألياف القابلة للذوبان، التي تخفض مستويات الكولسترول الضار في الدم، وتخفض مستويات الكلوكوز في الدم.

✔ الخضروات غير نشوية: تعتبر خياراً صائباً لمرضى السكري، إذ تحتوي على مجموعة مختلفة من الفيتامينات تساعد جميعها في خفض مستويات السكر في الدم. وربما تكون الخضروات غير نشوية من أفضل أنواع الأغذية للمصابين بمرض السكري من النمط الثاني. أثبتت الدراسات أن الخضروات الغير نشوية تخفض خطر الإصابة بارتفاع ضغط الدم، أمراض القلب، والسرطان. (لقطيفة. الخرشوف. نبات الهليون. الفاصوليا. براعم الفاصوليا. البنجر.

البروكلي. الملفوف. القرنبيط. الكرفس. الخيار. الباذنجان.. الكراث. الفطر. الباميا. البصل. الفلفل. الفجل.) وعلى عكس الخضروات النشوية (لذرة. البطاطا. البطاطا الحلوة. البازلاء الخضراء. الشمندر أو البنجر. الجزر والجزر الأبيض.) ، فإن الخضروات غير نشوية ذات محتوى منخفض للغاية من الكربوهيدرات. على جميع مرضى السكر تناول طبق عشاء يحتوي على نصفه على خضروات غير نشوية.

✔ التوت: يحتوي التوت على مركبات تُعرف بالأنثوكيانينات وهي مواد مفيدة لمرضى السكري. تناول حصتين يومياً ـ توفر ما يعادل 320 مكا تقريباً من الأنثوكيانين ـ قد يقلل من مستويات السكر في الدم لا كثر من 8%. ويمكنه تقليل مقاومة الأنسولين بأكثر من 13%. كما يعتبر التوت مصدر جيد لفيتامين سي والألياف، ولا يحتوي على الكثير من الكربوهيدرات. يمكن تناول التوت على الإفطار.

✔ الفواكه الحمضية: توفر الفواكه الحمضية فوائد جمة للمرضى السكري، وتشمل التحكم في ضغط الدم. ومع ذلك، ينبغي تناولها باعتدال، إذ تحتوي على كميات كبيرة من الكربوهيدرات التي قد تسبب ارتفاع مستوى السكر في الدم إذا لم يخضع المريض للعلاج. يقال أن معظم الكربوهيدرات الموجودة في الفواكه الحمضية عبارة عن ألياف (حوالي 4-21 غم كربوهيدرات في البرتقالة الواحدة)، التي تخفض مستويات الكولسترول والكلوكوز في الدم.

✔ الأسماك: على مريض السكر تناول حصتين على الأقل من الأسماك أسبوعياً، مقدار كل منهما 140 غم، على أن تكون نصفها على الأقل من الأسماك الزيتية. ومن بين الأسماك الزيتية السلمون، التونة،

تحتوي الأسماك على مجموعة كبيرة من الفيتامينات التي تحافظ على صحة العظام. تحتوي على فيتامين(د) المفيد للبشرة، العيون، خلايا الدم الحمراء، والجهاز العصبي، التي قد تتأثر جميعها بفعل مرض السكري. يوصى بتناول الأسماك لاحتوائه على كميات كبيرة من البروتين والدهون الأحادية الغير مشبعة ـ أي الدهون المفيدةـ التي تحسن من صحة القلب وتخفض مستويات الكولسترول الضار.

✔ الكربوهيدرات: أوصت الجمعية الأمريكية لمرض السكري في عام 1994 بضرورة أن تكون نسبة تتراوح ما بين 60% إلى 70% من مقدار السعرات الحرارية التي يتم الحصول عليها في صورة كربوهيدرات. وكما ذكر أعلاه، فإن هذا أمر مثير للجدل، إذ إن بعض الباحثين يرون أنه من الأفضل أن تكون تلك النسبة 40%أو أقل، في حين يؤكد آخرون على فوائد اتباع نظام غذائي غني بالألياف يشتمل على كربوهيدرات بنسبة 75%.

وفي احدي الأبحاث الذي تضمن وجهة نظر الجمعية الأمريكية لمرض السكري العبارة التالية: "يمكن الاستعاضة عن الأغذية التي تحتوي على السكروز بأنواع أخرى من الكربوهيدرات في خطة الوجبات الغذائية، أو، في حالة إضافتها إلى خطة الوجبات الغذائية، يمكن أن تدعم هذه الخطة بنظام علاج بالأنسولين أو بنظام علاج لخفض نسبة السكر في الدم. وينبغي توخي الحذر لتجنب تناول مقدار مفرط من السعرات الحرارية." إن السكروز لا يزيد من معدل سكر الدم بدرجة أكبر من العدد نفسه من السعرات الذي يتم الحصول عليه في صورة نشا. وعلى الرغم من أنه لا ينصح باستخدام الفركتوز كمحلٍ، فإنه لا يجب تجنب الفواكه لمجرد أنها تحتوي على فركتوز. ويمكن الحصول على فوائد من تناول الألياف الغذائية جنبًا إلى جنب مع الكربوهيدرات؛ وكما يشير "فرانسيس" (1987)، فإن ثمة أدلة توضح أن تناول الكربوهيدرات مع الألياف الغذائية سيؤثر بدرجة أقل على زيادة نسبة السكر في الدم مما إذا تم تناول المقدار نفسه من الكربوهيدرات على حدة. ويمكن القول إن ما لم يتم تضمينه في العموم في التوصيات الخاصة بالنظام الغذائي لمرضى السكري هو الأنواع المختلفة من الأطعمة الغنية بالكربوهيدرات.

وعلى الرغم من أن هناك اعتقادًا سائدًا مفاده أن سكر المائدة يلعب دورًا في الإصابة بمرض السكري، فإن له مؤشر جلاي سيمي متوسط (يتراوح ما بين 55 إلى 69) ينتج فعليًا مستويات أقل من سكر الدم من الكم نفسه من السعرات الحرارية الذي يتم الحصول عليه من المصادر الأخرى من الكربوهيدرات. وقد أوصت الجمعية الكندية لمرض السكري بأن يتم تضمين سكر المائدة كجزء من النظام الغذائي لمرضى السكري.

Low-carb alternatives البدائل منخفضة الكربوهيدرات

توضح بعض الدراسات أن اتباع نظام غذائي منخفض الكربوهيدرات أو نظام غذائي منخفض المؤشر الكلايسيمي ربما يكون فعالاً في إدارة مرض السكري من النوع الثاني، نظرًا لأن كلا الأسلوبين يحول دون حدوث زيادة حادة في نسبة السكر في الدم بعد تناول الطعام.

وينتقد الدكتور ريتشارد بيرنشتاين بشدة الخطة الغذائية القياسية التي وضعتها الجمعية الأمريكية لمرض السكري. وتشمل خطته تناول كميات محدودة من الكربوهيدرات (30 غرام كل يوم)، جنبًا إلى جنب مع مراقبة نسبة السكر في الدم وممارسة تمرينات بناء العضلات العنيفة بانتظام، وبالنسبة لمرضى السكري الذين يستخدمون الأنسولين، الحقن بجرعات صغيرة من الأنسولين عند اللزوم. ويتمثل الهدف من النظام العلاجي الذي يقدمه بيرنشتاين في "الاقتراب من مستويات سكر الدم الطبيعي" على الدوام.

٣- المحاضرة الثالثة:

vegan alternatives البدائل النباتية

مثال على إفطار نباتي غني بالألياف، مناسب للمصابين بسكري النمط الثاني.

لقد أظهرت الدراسات الحديثة أن اتباع نظام غذائي نباتي قد يكون فعالاً أيضًا في إدارة مرض السكري من النوع الثاني.

توقيت تناول الوجبات: Meal timing

بالنسبة للأفراد الذين يعانون من مرض السكري، لا يتمثل النظام الغذائي الصحي في اختيار الأغذية الصحية التي يجب أن يتناولونها فحسب، وإنما أيضا في تحديد التوقيت الصحيح لتناولها. لقد تناول الباحثون سونسكين وفوكس في كتاب من تأليفها وصدر في عام 1988 التساؤل المطروح بصدد الفترة التي يجب أن ينتظرها مريض السكري بعد أخذ حقنة الأنسولين قبل أن يتناول أية وجبة غذائية. وتتمثل الإجابة عن ذلك التساؤل في أن تحديد تلك الفترة يعتمد على نوع الأنسولين الذي يتناوله المريض وما إذا كان طويل أم متوسط أم قصير المفعول. وإذا تحقق المرضى من نسبة سكر الدم وقت النوم واكتشفوا أنها منخفضة، يكون من المستحب أن يتناولون كربوهيدرات طويلة المفعول قبل أن يخلدوا للنوم وذلك للحيلولة دون نقص سكر الدم أثناء الليل.

الأدوية الفموية الخافضة للسكر Oral anti-diabetic drugs

تعرف مضادات السكري anti-diabetic drug : أو العوامل الفموية الخافضة للسكر : oral hypoglycemic agent بانها الأدوية المستخدمة رسميا لمعالجة داء السكري . وتعمل هذه الأدوية عادة على خفض مستويات الكلوكوز في الدم. و تحتوي عدة أنواع مختلفة يعتمد استخدام كل نوع على طبيعة و نوع داء السكري، عمر و وضع المريض، إضافة لعوامل أخرى مثل وجود أمراض أخرى يعاني منها المريض.

محرضات إفراز الأنسولين

لم تورد المصادر الحديثة مادة الغليبنكلاميد بسبب إهمال استعمالها لطول عمرها النصفي و كثير من المصادر أهملت ذكر الجيل الأول للسلفونيل يوريا لنفس السبب و لكن المصادر التابعة لمنظمة الصحة العالمية تعتمد استتخدام الغليبنكلاميد.

ميتفورمين (metformin)

يساعد دواء ميتفورمين على ضبط معدلات الجلوكوز في الدم، وتحسين استجابة الجسم للأنسولين، وهو العلاج المفضل لدى الغالبية العظمى من مرضى السكري من النوع الثاني.

(ميتفورمين)الاسم الكيميائي وبعض الأسماء التجارية   Diabex, Diabex XR* metformin, Diaformin, Diaformin XR*, Format, Genepharm Metformin Genrx metformin, Glucohexal, Glucohexal 1000, Glucomet*,

Glucophage, Metex XR*, Metforbell, Metformin XR

أنها تساعد على خفض مستويات الجلوكوز في الدم عن طريق

> تقليل كمية الإفراز عن الجلوكوز المخزّن بواسطة الكبد

> إبطاء امتصاص الجلوكوز من الأمعاء

> مساعدة الجسم لكي يصبح أكثر حساسية للأنسولين بحيث يعمل الأنسولين الخاص بك بشكل أفضل.

يمكن أن تشمل الآثار الجانبية الغثيان والإسهال وطعم خاص في الفم. للحد من الآثار الجانبية، ينبغي أن تؤخذ الأقراص مع أو بعد الأكل. انها بحاجة إلى أن تبدأها بجرعة منخفضة والزيادة ببطء.

لقد تبين من أن ميتفورمين يحد من معدل الوفيات الإجمالي للأشخاص الذين يعانون من السكري من النوع الثاني أكثر من تأثيره اعلى قراءات الكلوكوز. ولهذا السبب غالبا ما يعتبر ميتفورمين الخيار الأول في إدارة السكري من النوع 2.

سلفونيليوريا (sulfonylureas)

.سلفونيل Diamicron† , Diamicron MR*, Genrx gliclazide, Glyade, Gliclazide *Mellihexal, Nidem, Oziclide MR Daonil, Glimel Glibenclamide Melizide, Minidiab Glipizide Amaryl, Aylide, Diapride, Dimirel,

Glimepiride Sandoz Glimepiride

سلفونيل يوريا انه يخفض مستويات الجلوكوز في الدم من خلال تحفيز البنكرياس على إنتاج المزيد من الأنسولين . ينبغي أن تؤخذ الأقراص بالضبط قبل وجبة الطعام. هناك خطر أقل لحدوت انخفاض مستوي السكر إذا تناولت وجبات منتظمة (وجبات خفيفة إذا أوصيت بذلك) على مدار اليوم .ممكن أن تشمل الآثار الجانبية زيادة الوزن ونادرا ما يظهر طفح جلدي، اضطراب المعدة واليرقان . ينبغي ألا تؤخذ من قبل النساء الحوامل أو المرضعات . حيث أن السكري من النوع 2 هو تقدمي، طبيبك قد يحتاج إلى زيادة الجرعة تدريجيا مع مرور الوقت .قد تكون هناك حاجة أن يكون سلفونيل يوريا مصحوباً بأقراص ميتفورمين ميجليتينيد (meglitinides)

يعتبر من الأدوية سريعة المفعول، التي تعمل على تحفيز البنكرياس لإنتاج المزيد من الأنسولين، وعادة ما يؤخذ قبل تناول الوجبات.

الثايازوليدينايونز (thiazolidinediones)

(Avandia Rosiglitazone Actos Pioglitazone)

(غليتازون) إنه يساعد على خفض مستويات الجلوكوز في الدم عن طريق زيادة تأثير الأنسولين الخاص بك، ولاسيما على العضلات و الدهون أي: إنه يحسن مقاومة الأنسولين .أثره بطيء، ويأخذ من أيام إلى أسابيع لبدء العمل وشهر إلى شهرين لتأثيره الكامل .إنه يعمل بشكل جيد بالاقتران مع بعض أقراص السكري الأخرى .إذا أخذته لوحده، فإنه ألا يسبب انخفاض مستويات الجلوكوز في الدم ولكن هذا يمكن أن يحدث عندما يؤخذ مع سلفونيل يوريا .ومن الآثار

الجانبية هي زيادة الوزن. يتم نقل الدهون من المناطق التي هي سيئة لصحتك (حول البطن) إلى مناطق أخرى مثل الجزء العلوي من الفخذين.

ميغليتينايدز الاسم الكيميائي الأسماء التجارية Novonorm Repaglinide

(Novonorm).

انه يخفض مستويات الجلوكوز في الدم من خلال تحفيز البنكرياس على إنتاج المزيد من الأنسولين، ورغم أنه ألا يتصل كيميائيا بسلفونيل يوريا. إنه سريع المفعول لا يدوم طويلا لذلك يتم أخذ قرص قبل كل وجبة لتحفيز الأنسولين للتعامل مع تلك الوجبة. إنه يوفر المرونة للأشخاص الذين يعانون من عدم انتظام أنماط الكل على سبيل المثال: عاملي المناوبة. ويمكن أن يسبب انخفاض مستوي السكر. الآثار الجانبية الأخرى غير انخفاض مستوى الجلوكوز في الدم هي غير مألوفة ولكن يمكن أن تشمل اضطرابات في المعدة واضطرابات في اختبارات وظائف الكبد. ينبغي ألا يؤخذ من قبل النساء الحوامل أو المرضعات.

DPP-4 inhibitors

Januvia Sitagliptin Galvus VILDAGLIPTIN

– دي بي بي 4 إنه يعزز قدرة الجسم الذاتية لخفض مستوي الكلوكوز في الدم عندما يرتفع.

Incretin mimetics

الاسم الكيميائي Byetta الأسم التجارية Exenatide

يتم حاليا وصف باي إيت (Byetta) فقط مع الحد الأقصى لجرعة إما ميتفورمين أو سلفونيل يوريا أو كليهما، ونسبة HbA1c هي أكثر من 7. ٪ مُشابهات إلينكريتين هي أدوية تعطى بالحقن.أنها تقل التحكم في مستويات الكلوكوز في الدم بعد الوجبات .يساعد إيكسيناتايد(Exenatide) على خفض مستويات الكلوكوز في الدم عن طريق > :تحفيز البنكرياس انتتاج المزيد من الأنسولين >تقليل كمية الكلوكاجون المنتج عنه من البنكرياس بعد الأكل. الكلوكاجون هو هرمون لديه تأثير معاكس للأنسولين يفرز خلايا الفا من جزر لانكرهنز لذلك يزيد من مستويات الجلوكوز في الدم >إبطاء مرور الطعام من المعدة إلى الأمعاء حتى يتم امتصاص الغذاء ببطء أكثر وبثبات

٤ - المحاضرة الرابعة:

تعديلات النمط الحياتي غير الصحي عند المرضى

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

1 .في أنه لم يكن لديه نظام ثابت للوجبات الغذائية قبل ظهور الإصابة السكرية لديه

2. لم يكن يوزع غذائه على وجبات متعددة في اليوم، بل كان يجمعها في وجبة واحدة متخمة أو وجبتين إحداهما متخمة قبل النوم

3. 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

4. أنه يتوجب على المريض أن يعي العلاقة الزمنية بين تأثير الأدوية الخافضة لسكر الدم التي يتناولها أو يحقنها وموعد تناول الوجبة الطعامية

5. أنه يجب أن يعي العلاقة الزمنية بين الجهد البدني والدواء والغذاء ، وهذا ألا يتحقق إلا من خلال التثقيف الهادف بمرض السكري

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

7. أنه ألا يدرك مفهوم الشبع بدقة، هل هو الشعور بالامتلاء أم الشعور بالاكتفاء

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

9. في كون الجوع الضروري المفرط وعدم الشعور بالشبع، أو الشعور بالقمه الشديد وفقدان الرغبة بأي طعام، هي من أعراض وعلامات الإصابة بالسكري التي تعيق تنفيذ النظام الغذائي العلاجي بسهولة ويسر.

10. أنه رغم كل ما سبق يجب الراحة والإقلال من بذل الجهد البدني العضلي ومن هنا ، يعتبر تعديل الأنماط الغذائية غير الصحية السابقة وزيادة النشاط البدني هو ما اصطلح على تسميته قواعد تعديل النمط الحياتي لمريض السكري، وهذه الناحية الهامة في تدبير السكري تتطلب من العامل الصحي التمريضي أو المثقف أن يمتلك مهارات التقصي عن العادات غير الصحية، وجدولة تعديلات النمط الحياتي بالتدريج حتى تتحول التعديلات إلى نمط حياتي اعتيادي يسهم في تعزيز تحقيق الأهداف العلاجية اضطرابات السكري والاستقلاب.

خطوات التنظيم الغذائي وإعداد الغذاء الصحي Steps to organize food and prepare healthy food

1. تحديد الوزن المثالي للشخص السكري

2. تحديد كمية السعرات الحرارية اللازمة للمصاب السكري يوميا

3. توزيع كمية السعرات الحرارية على العناصر الغذائية المختلفة من كربوهيدرات وبروتين ودهون، ثم حساب الكميات الوزنية من كل عنصر غذائي، ثم توزيع الكميات على الوجبات الرئيسية والوجبات الخفيفة.

4. تحويل العناصر الغذائية المختلفة إلى بدائل غذائية

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

أخصائي التغذية.Specialist or nutritionist

تعتبر الرياضة عامل مساعد ومهم في علاج السكري حيث ورد ذكر النشاط الجسماني كعامل مساعد في عالج السكري منذ قديم الزمان. وذكر قديما وحديثا أن درجة النشاط الجسماني ذات تأثير مباشر على حاجة الإنسان للطعام؛ أي أنه يمكن زيادة تناول الطعام إذا زاد النشاط الجسماني. ولذا فإن ممارسة النشاط الجسماني بالطريقة التي تناسب تكوين الجسم البشري كما خلقه الله، والابتعاد عن حياة الخمول وعدم الحركة يساعد على منع أو تأجيل حدوث مضاعفات السكري المزمنة وما ينجم عن ذلك من إصابات ووفيات. إن الاعتقاد بأن الحمية الغذائية وحدها كافية في معالجة داء السكري، اعتقاد خاطئ، ويمكن أن تؤدي الحمية الغذائية المتشددة إلى آثار ضارة، إذا لم تقترن بنشاط جسماني مبرمج. ولذا فإن ممارسة النشاط الجسماني المدروس هو أحد الأركان الثلاثة في معالجة السكري.

أنواع النشاط البدني :Types of physical activity

يتراوح النشاط الجسماني بين تحريك العضلات أثناء الجلوس في الكرسي وبين ممارسة الرياضة البدنية العنيفة. 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:

شكل رقم (2) أنواع الرياضة

1. النوع الأول: الرياضة الساكنة / التي تعتمد على شد العضلات وتعتمد على قوة الجهد، لمدة محدودة وينجم عن ذلك زيادة نمو بعض عضلات الجسم، مثل رياضة رفع الأثقال.

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

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

فوائد الرياضة البدنية: Benefits of physical exercise :

أولا زيادة احتراق الغلوكوز

1 - عند الشخص غير المصاب بالسكري: In a person who does not have diabetes

يزداد امتصاص العضلات لغلوكوز الدم الاستعمال وقودا لحركة الشخص غير المصاب بالسكري. وقد لوحظ أن ممارسة رياضة الجري مثال تزيد في معدل امتصاص عضلات الرجلين لكلوكوز في الدم حوالي 7 – 20 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.

2 ـ عند الشخص المصاب بالسكري: For a person with diabetes

يلاحظ في الأشخاص المعالجين بالنسولين كثرة حدوث نقص سكر. 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 ممارسة الرياضة .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 بدال عن الفخذين للتخفيف من سرعة امتصاص الأنسولين الدوائي كإجراءً 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 لفعل الأنسولين 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 بتأثير الرياضة البدني

يمكن للنشاط الرياضي البدني متوسط الشدة مثل المشي السريع أو السباحة أن تفيد بعض الشيء، ولكنها ألا تعادل تأثير التمارين الرياضية المكثفة. ولكي يعطي هذا النشاط البدني فائدته فإن على أولئك القادرينَ أن يمارسوا نشاطاً بدنيا كبيرا كافيا لرفع سرعة نبض القلب إلى حوالي 150 في الدقيقة لمن هم دون الثلاثون من العمر أو حوالي 130 في الدقيقة لمن هم فوق الخمسون من العمر. وقد ثبت أن النشاط الرياضي المتزايد يقلل من حدوث الآفة القلبية وأمراض الشرايين .

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 200 غ في اليوم. ويؤدي نقص الفاعلية الفيزيائية في الحياة اليومية إلى انخفاض معدل إعادة بناء بروتينات العضلات، وبالتالي يفقد تدريجيا جزءا من التكوين العضلي، إلا أن ذلك ربما ألا 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 ألا يرغبون أو ألا يستطيعون الاستماع بالنشاط الرياضي. ولكنهم عندما يتقدمون في الممارسة يشعرون بالسعادة عندما يلاحظون تحسن وظائف الجسم بالرياضة وخفة الحركة واستعادة مرونة المفاصل. وتتناقص الإحساس بالخمول والكسل الذي ينتاب غير الممارسين. عندما يقرر المصاب بالسكري زيادة نشاطه اليومي فيجب عليه أن يفعل ذلك تدريجيا ولإحساس بالتعب والإرهاق الناجمين عن عنف النشاط الجسماني الزائد. ويجب أيضا تقييم حالة القلب والأوعية الدموية قبل هبوط سكر الدم هو انخفاض سكر الدم إلى مستوى 60 ملغ/دل أو أقل من ذلك، وقد نعتبر الرقم أقل من 70 ملغم /عند مرضى السكري المعالجين بالأدوية الخافضة لسكر الدم هو بداية هبوط سكر الدم، وهي حالة إسعافيه تستوجب تقديم مادة سكرية أو شراب محلى بالسكر أو عصير فواكه بشكل سريع ودون إبطاء للمريض السكري الذي أصبح لديه هبوط سكر دم. أسباب حدوث هبوط سكر الدم عند المصاب بالسكري: تكمن معظم الأسباب في عدم تطبيق النظام العلاجي المقرر لمريض السكري بشكل دقيق وصحيح، مما يفقد التوازن بين القواعد العلاجية الثلاثة: (الدواء – الغذاء – الرياضة).

5- المحاضرة الخامسة:

أولا – الأسباب الدوائية: Pharmacological causes

1. إذا كانت جرعة الدواء زائدة، كأن يزيد المريض جرعة الأنسولين خطأ بدون استشارة الطبيب

2. التقارب في مواعيد حقن الأنسولين وعدم الالتزام بالتوقيت الزمني لكل جرعة بشكل دقيق

3. 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 مثلا.

4. أحيانا بسبب تناول بعض الأدوية التي لها تأثير مفعل لأدوية السكري

5. بسبب حقن الأنسولين في وقت مبكر من المعتاد بدون مبرر طبي

6. أو ابتلاع الحبوب الخافضة للسكر التي نسي المريض ابتلاعها صباحا مع حبوب المساء

ثانيا – الأسباب المتعلقة بالغذاء: Food-related causes

1. التأخر عن موعد تناول الوجبة الطعامية المقرر وفق زمن تأثير الدواء الخافض لسكر الدم أو الأنسولين

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

3 .عدم الالتزام بتناول الوجبات الخفيفة التي أشارلها الطبيب في الوقت المحدد

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

5 .تناول وجبات فقيرة بالنشويات كأن يكتفي المصاب بالسكري بتناول اللحم والسلطة دون الخبز مثلا.

6 .عدم الانتظام في مواعيد تناول الوجبات الطعامية وتباعد الفترات بين وجبة وأخرى

7 .عدم تناول الطعام وقت ذروة الأنسولين الذي حقنه المريض

8 .عدم تناول الطعام قبل ممارسة الأشغال المرهقة مثل حرث الأرض أو جمع الثمار أو تنظيف السجاد

ثالثا – الأسباب المتعلقة بالجهد البدني:Causes related to physical exertion

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

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

3 .ممارسة العمل البدني الشديد وقت ذروة الأنسولين أو وقت ذروة فعالية الحبوب الخافضة لسكر الدم Effectiveness of pills for lowering blood sugar

4 .ممارسة الجهد البدني لفترات أطول مما تحتمله الحالة الصحية وعدم أخذ فترة من الراحة لتناول قطعة فاكهة مثال أو وجبة الغذائية.

أعراض وعلامات هبوط سكر الدم:

• شحوب واصفرار الوجه

• عرق بارد وغزير

• تسرع نبض القلب مع تسرع التنفس بدون جهد

• رجفة وارتعاش

• جوع شديد

• مشية متمايلة أو مترنحة مع شعور بالتعب

• عصبية ونرفزة مفاجئة وغير مبررة و عدوانية وهياج أحيانا

• توازن متأرجح

• تشوش الذاكرة

• صداع

• تشوش الرؤية وزغللة في البصر

• وهن وإنهاك وتعب مفاجئ ومتزايد

• صعوبة في تركيز الذهن والتفكير

• قد يغيب كثير من الأعراض السابقة وتبقى أعراض الهياج العصبي فقط، عندئذ البدء من إجراء تحليل سكر الدم للتأكد من هبوط سكر الدم

• تقطع الوعي ثم غياب الوعي بسبب لهبوط سكر الدم الذي يحدث ليلا أثناء النوم، ويتظاهر بالأعراض التالية:

• ظهور عرق بارد وغزير يبلل الوسادة على الرغم من برودة الجو مثلاً

• تسرع نبض النائم الذي لديه هبوط سكر الدم مع تيبس عضلاته

• شخير وكوابيس وأحلام مزعجة يصعب معها إيقاظ النائم بسبب انخفاض سكر الدم سكر الدم ناقص تكمن خطورة حوادث هبوط سكر الدم في كونها تؤثر على حياة المصاب خلال فترة أقل من ساعة، ويمكن لها أن تكون مؤذية للمريض إذا وصل إلى مرحلة الغيبوبة، كما يمكن عند تكرارها أن تسبب الأذى للخلايا العصبيةً وخصوصاً عند الأطفال، لاسيما إذا كان المصاب في مرحلة النمو أو في مقتبل العمر أو كبير في السن، وهذا ألا يعني ترك مستويات سكر الدم مرتفعة دوما، بل يؤكد على أهمية المحافظة على مستويات مقبولة لسكر الدم معظم أوقات اليوم وتعلم مهارات منع هبوطه ومنع ارتفاعه والرجحة بين المستويات المقبولة، وهذا ما تهدف برامج التثقيف المجموع والفردي والمراقبة الدورية والمنزلية لمستويات سكر الدم تحقيقه من خلال العمل السريري في مراكز السكري والعيادات. وعلى ذلك ، يتطلب علاج هبوط سكر الدم دائما تدخلا فوريا بتناول المواد الكربوهيدراتية والسكرية بكميات معروفة تعمل على رفع سكر الدم فوق 100ملغم / د ل ودون 180 ملغم / أما العالج الإسعافي لحوادث هبوط سكر الدم فيكون كالتالي:

1.يقدم الطعام فورا للمصاب الواعي، أو 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.

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

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

4. يعطى الطفل فوق عمر 11 سنة الجرعة الكاملة من محلول الجلوكاجون 1 ملغ، بينما يعطى الطفل الأقل من ذلك نصف الحقنة، أما الأطفال دون عمر الثالث سنوات فيكفي إعطاؤهم ثلث الجرعة.

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

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

8. 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.

٦- المحاضرة السادسة:

القدم السكرية: diabetic foot

نبذة مختصرة:

يمكن للمشاكل البسيطة في القدمين أن تتطور لدى المصاب بالسكري وتسبب مضاعفات خطيرة. قد تبدأ المشاكل بفقدان الإحساس في القدمين لتصل إلى مرحلة البتر في أسوأ الأحوال. غالبًا يبدأ اعتلال الأعصاب السكري في القدمين والساقين ثم يتلوهما اليدين والذراعين. يمكن علاج الحالة إما بالعلاج غير الجراحي أو الجراحي. للوقاية من مشاكل القدمين فإنه ينصح بالتحكم بمستوى السكر بالدم واتباع إرشادات العناية بالقدمين. تأثير السكري على الأوعية الدموية والأعصاب بالقدمين: عند ارتفاع السكر بالدم لدى المصابين بداء السكري فإن الأوعية الدموية والأعصاب تتأثر مع مرور الوقت، ويؤدي تأثر الأعصاب إلى فقدان الإحساس في القدمين، أي عدم الشعور بالجروح والقروح التي تصيب القدم . مما يؤدي إلى التهاب أما في الأوعية الدموية فقد يؤدي إلى عدم إيصال كمية كافية من الدم المحمل بالأكسجين إلى القدمين، وكذلك يصعب عملية التئام الجروح أو تغير شكل القدم.

القدم السكرية: diabetic foot

يصاب مرضى السكري بالعديد من المشاكل في القدمين، حتى المشاكل البسيطة قد تتطور وتسبب مضاعفات خطيرة، ومشكلة القدم السكرية تحدث غالبًا عند تلف أعصاب القدمين (اعتلال الأعصاب السكري).

الشكل رقم (3) فحص القدم السكري

تأثير داء السكري على القدمين: The effect of diabetes on the feet

- فقدان الإحساس: الإحساس بالألم والبرودة والحرارة: عند إصابة قدم المريض لن يستطيع معرفة ذلك، على سبيل المثال عند دخول حصى في الحذاء لا يتمكن المريض من معرفة ذلك وتبقى بداخل الحذاء وتؤذي القدم.

- تشوه القدم: تغير شكل القدم عند ارتداء حذاء ضيق لفترة طويلة. السبب: اعتلال الأعصاب السكري.

- تغيرات في الجلد: مع مرور الوقت، قد تبدأ القدم بالجفاف؛ مما ينتج عن ذلك تقشرها وتشققها. السبب: تلف الأعصاب المسؤولة عن ترطيب القدم.

- مسمار القدم: يتكون مسمار القدم بسرعة وبكثرة عند المصابين بداء السكري، وقد يتطور ويزداد سماكة ويتحول إلى قرحة بالقدم. السبب: الضغط الشديد على القدم.

٧- المحاضرة السابعة:

تقرحات القدم:　foot ulcers

تحدث غالبًا في مقدمة الجهة السفلية من القدم أو باطن إبهام القدم، وتظهر التقرحات على جانبي القدم غالبًا بسبب مقاس الحذاء غير المناسب. السبب: يحدث بسبب عدم التئام الجروح أو إصابتها بالعدوى.

ضعف الدورة الدموية: Poor blood circulation:

يؤدي ذلك إلى عدم قدرة القدم على محاربة العدوى والشفاء منها.

السبب: لأن داء السكري يعمل على تضييق وزيادة سمك الأوعية الدموية.

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

الـــــــبتر: amputation

الشكل رقم (4) بتر أصابع القدم

يحدث في المراحل المتقدمة من التهاب القروح. السبب: فقدان الإحساس، وضعف الدورة الدموية. أعراض وعلامات اعتلال الأعصاب السكري في الأطراف: غالبًا ما تصيب القدمين والساقين أولًا ثم يتلوهما اليدين والذراعين، حيث تزداد حدة في المساء، وتشمل: الخدر وفقدان الشعور بالألم والحرارة.

الشعور بالتنميل. قد تزداد حدة الإحساس (مثل عدم تحمل وزن غطاء السرير عند تغطية القدمين).ضعف العضلات. فقدان المرونة (خاصة مفصل القدم).فقدان التوازن والتناسق. ظهور مشاكل في القدمين، مثل: التقرحات، العدوى، التشوه، ألم في العظام والمفاصل. تغير لون الجلد. متى يجب رؤية الممرض: عند وجود تقرحات حتى لو كانت بسيطة. عند عدم التئام الجروح أو سوء حالتها. عند تأثير التنميل، والضعف، والألم على الحياة اليومية.

الشكل رقم (5) يوضح أعراض وعلامات القدم السكري

علاج قدم السكري: Diabetic foot treatment:

1. العلاج غير الجراحي: Non-surgical treatment

- تنظيف الجروح وتغطيتها بالشاش. بعد تعقيمها
- استخدام المضادات الحيوية المناسبة عند الإصابة بالعدوى.
- يمكن معالجة تشوه القدم باستخدام الجبيرة أو الجبس الطبي.
- استخدام الأحذية الطبية.
- التحكم بالغرغرينا بالأدوية المناسبة.

2. العلاج الجراحي: Surgical treatment

- قد تتم معالجة العدوى الشديدة عن طريق إزالة الأنسجة الملتهبة أو بترها.
- معالجة تشوه القدم بعملية لتصحيحها وتجميلها.
- البتر الجزئي للمنطقة المصابة بالغرغرينا أو البتر الكامل.

الوقاية والعناية بالقدمين: Foot care and prevention :

- التحكم بمستوى السكر بالدم.
- 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.

٨- المحاضرة الثامنة:

العناية بالقدمين، وذلك عن طريق: foot care

- 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 جوارب واسعة عند النوم. عدم تعريضها بشكل مباشر للثلج والمطر. تجنب وضع قدم فوق الأخرى لفترة طويلة؛ لأنه يمنع من تدفق الدم إلى القدمين. تجنب التدخين.

عند ارتداء الجوارب والأحذية: When wearing socks and shoes :

- تجنب المشي حافي القدمين.

- تجنب ارتداء الأحذية المفتوحة.

- اختيار الحذاء بعناية وتجربة مقاسه في نهاية اليوم حيث يزداد حجم القدم.

- 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.

- ارتداء جوارب نظيفة وجافة وتغييرها كل يوم،

- وتجنب ارتداء الجوارب المثقوبة.

نصائح العناية بالقدم إذا كان لديك مرض السكري. **Foot care tips if you have diabetes.**

- راجع أخصائي القدم الخاص التابع لخدمات المراكز المتخصصة مرة واحدة على الأقل في السنة. وبالإمكان مراجعة أخصائي القدم التابعة لتلك المراكز المتخصصة إذا كنت تعاني من حالة طويلة الأمد مثل مرض السكري والمتابعة مع الطبيب أخصائي القدم.

- حافظ على قدميك نظيفة وخالية من العدوى.

- ارتدي أحذية تناسب قدمك جيدا بدون التسبب في ضغط أو فرك. يمكن للأحذية الغير مناسبة أن تسبب مسامير القدم وتلب الجلد والقرحة ومشاكل الأظافر.

- لا تمشي حافي القدمين أبدا، لاسيما في الحديقة أو على الشاطئ في الأعياد وحاول تجنب الجلوس مع الساقين أحدهما فوق الأخرى.

- قص أو شذب أظافرك بانتظام.

- 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 24 ساعة، ولاسيما إذا كان هناك احمرار أو تورم في جميع أنحاء المنطقة، أو في منطقة تم تحذيرك مسبقا لتحصل على رعاية فورية لها.

Stop smoking to protect your feet. التوقف عن التدخين لحماية قدميك.

إذا كان لديك مرض السكري، فمن المهم أن تحاول التوقف عن التدخين. التدخين يضعف الدورة الدموية، وخاصة في مرضى السكري. ويمكن أن تتفاقم مشاكل القدم والساق بشكل خطي

Ministry of Higher Education
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وزارة التعليم العالي والبحث العلمي   جمهورية العراق

جامعة بابـل
كلية التربية للعلوم الانسانية

Ref. No :

Date: /   /

العدد :
التاريخ :

إلى / جامعة بابل / عمادة كلية التمريض / مكتب السيد معاون العميد للشؤون العلمية المحترم

م / اعادة اطروحة

تحية طيبة :

نعيد إليكم اطروحة طالب الدراسات العليا / الدكتوراه (سالم كريم هجول كاظم) بعد تقويمها لغويا من أ.د.رعد كريم عبد عون من قسم اللغة الانكليزية في كليتنا وقد ثُبتت الملاحظات على متن الاطروحة . نأمل من الباحث الالتزام بها أثناء طبع الاطروحة.

*** مع الاحترام ***

أ.د.اسامة كاظم عمران
معاون العميد للشؤون العلمية
والدراسات العليا

نسخة منه إلى //

ـ الدراسات العليا .

ـ الصادرة.

07801010633 امنية

البريد الالكتروني bad_edu_humsci@yahoo.com

www.uobabylon

الخلاصة

مرض السكري، وخاصة النوع الثاني، مؤخرًا مرضًا خطيرًا مع احتمالية عالية لزيادة معدل الاعتلال المشترك نظرًا لأنه مرض مدى الحياة يتطلب شخصًا لديه معرفة كافية بالأمراض نفسها بالإضافة إلى الرعاية الذاتية الجيدة.

تهدف هذه الدراسة الى تقييم فاعلية برنامج تعليمي على معارف مرضى السكري من النوع الثاني والعناية الذاتية. أجريت الدراسة في الفترة من 27 نوفمبر 2020 إلى 1 اذار 2022. استخدام الباحث تصميم شبه تجريبي لإجراء الدراسة. قام الباحث بتطوير البرنامج والأدوات لتحقيق أهداف الدراسة. تم اختيار ما مجموعه 50 مريضًا عن قصد مقسمين إلى مجموعتين: مجموعة الدراسة (25) مريضًا تم تطبيق البرنامج التعليمي عليهم كمجموعة دراسة، ومجموعة الضابطة (25) التي لم يطبق عليها البرنامج التعليمي.

تم قياس فعالية هذا البرنامج من خلال استخدام مستوى المعارف قبل الاختبار وبعده. وتشمل (20) فقرة معارف و (30) فقرة رعاية ذاتية. تم تحديد صلاحية الأداة من قبل لجنة من الخبراء، وتم تحديد موثوقية الأداة من خلال دراسة تجريبية. تم تحليل البيانات باستخدام الإحصائيات الوصفية والاستنتاجية لعناصر المعرفة العشرين 0.82 (قبل) و 0.86 (بعد). سجلت عناصر الرعاية الذاتية الثلاثين 0.76 (قبل) و 0.81 (بعد) والتي تعتبر مقبولة لاستقرار الأداة.

أشارت نتائج الدراسة إلى أن مجموعة الدراسة عبرت عن ضعف المعرفة بمتوسط ± 0.200 ± 1.23 = SD، وضعف الرعاية الذاتية عند متوسط .2.75 ± 1.24 = SD ± بينما أظهرت مجموعة الدراسة في مرحلة ما بعد الاختبار معرفة جيدة بمتوسط ± 2.71 = SD ± 0.277، ورعاية ذاتية جيدة عند متوسط 0.440 ± 2.75 = SD ±. وجدت الدراسة أيضًا أن هناك فرقًا ذا دلالة إحصائية بين الاستجابات الإجمالية لمجموعة الدراسة في فترتين من القياسات (الاختبار القبلي والاختبار البعدي) عند قيمة .0.01> p على العكس من ذلك، أظهرت المجموعة الضابطة ضعف المعرفة وضعف الرعاية الذاتية في درجة ما قبل الاختبار البعدي. لم يكن هناك فرق كبير بين الاستجابات الإجمالية لمجموعة التحكم في فترتين من القياسات (الاختبار القبلي والاختبار البعدي) عند قيمة.0.05> p

وفق النتائج خلصت الدراسة إلى أن المرضى لديهم حد أدنى من المعرفة والرعاية الذاتية ويحتاجون إلى برنامج تعليمي متخصص وجلسات تدريبية.

وأخيرًا ، أوصت الدراسة بإمكانية وزارة الصحة تخصيص مزيد من التمريضيين المؤهلين لتقديم الرعاية لمرضى السكر ، البدء باستخدام الاستراتيجيات الخاصة بالتثقيف والتعليم

بالمرض في فترة التشخيص وكذلك دعوة للمنظمات الى زيادة وعي المجتمع بخصوص المرض ومضاعفاته.

(ب)

جمهورية العراق

وزارة التعليم العالي والبحث العلمي

جامعة بابل كلية التمريض

فاعلية برنامج تعليمي موجه في معرفة مرضى السكري من النوع الثاني وممارسات الرعاية الذاتية في مدينة الحلة

أطروحة مقدمة إلى مجلس كلية التمريض

من قبل

ســـــــالم كريم هـــجول الــــجبوري

كجزء من متطلبات نيل شهادة الدكتوراه فلسفة في علوم التمريض

بإشراف

الأستاذ الدكتورة سلمى كاظم جـــــهاد

شوال 1443 هـ   ايار 2022 م