

**KNOWLEDGE, ATTITUDE, AND PRACTICES REGARDING LIFESTYLE  
MODIFICATIONS AMONG TYPE II DIABETES MELLITUS PATIENTS ATTENDING  
OUTPATIENT CLINIC IN UNIVERSITY OF BENIN TEACHING HOSPITAL**

**BY**

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**FACULTY OF NURSING SCIENCES**

**COLLEGE OF MEDICAL SCIENCES**

**UNIVERSITY OF BENIN**

**BENIN CITY**

**OCTOBER, 2025**

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**IN PARTIAL FULFILLMENT OF THE AWARD OF THE DEGREE OF BACHELOR  
OF NURSING SCIENCES (BNSC), COLLEGE OF MEDICAL SCIENCES,  
UNIVERSITY OF BENIN, BENIN CITY.**

**OCTOBER, 2025**

**CERTIFICATION PAGE**

This is to certify that this project was carried out by **OBASOGIE OSADEBAMWEN SUCCESS, Matriculation Number; BMS2001115**, Department of Nursing, under the supervision of DR. MRS. C.A. ENUKU.

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**EXTERNAL EXAMINER**

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**Sign & date**

## **DEDICATION**

This work is dedicated to GOD ALMIGHTY who is providing me with the strength to complete my academic journey.

## ACKNOWLEDGMENTS

I would like to express my heartfelt gratitude to the ALMIGHTY GOD for His abundant grace, wisdom, and strength throughout this research journey.

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# CHAPTER ONE

## INTRODUCTION

### 1.1 Background to the Study

Diabetes mellitus (DM) represents one of the most significant health challenges of the 21st century, with an impact stretching globally (Goyal & Rakhra 2024). Type 2 diabetes mellitus (T2DM), which is the most prevalent form of diabetes is primarily associated with excess body weight and physical inactivity (Castillo et al., 2025). The prevalence of diabetes has been steadily increasing worldwide, particularly in low- and middle-income countries. This rise is projected to continue, with current estimates indicating that around half a billion people are living with diabetes. Type 2 diabetes, in particular, is expected to contribute significantly to this burden, affecting populations across all regions (Tönnies et al., 2023).

The global prevalence of diabetes has been steadily increasing. According to the International Diabetes Federation (IDF), approximately 9.3% of adults aged 20 to 79 worldwide are currently affected by DM (IDF, 2022). Projections suggest that by 2045, the number of individuals with diabetes will increase from the current 463 million to 700 million (IDF, 2022). A WHO report from 2022 indicated that around 463 million adults had diabetes, and this number is projected to reach 578 million (10.2%) by 2030 and 700 million (10.9%) by 2045 (WHO, 2023). This increase in prevalence is particularly pronounced in low-income countries, where the rate is 4%, indicating a significant public health challenge (WHO, 2022).

In developing regions, particularly in Africa, an estimated 14.2 million people are contending with diabetes, a situation exacerbated by rapid urbanization and lifestyle changes (International

Diabetes Federation, 2022). Effective management of type 2 diabetes requires a holistic approach encompassing medication, physical activity, and dietary adjustments (Afsaneh, et al., 2022). The American Diabetes Association (ADA) emphasizes the importance of dietary habits characterized by low sucrose intake and high consumption of dietary fiber, fruits, vegetables, whole grains, and legumes. These dietary practices play a vital role in reducing the risk and controlling the symptoms associated with type 2 diabetes (American Diabetes Association, 2023).

The impact of T2DM is particularly severe in Africa and other developing regions. A significant proportion (79.4%) of adults with diabetes live in low- and middle-income countries. Alarmingly, 59.7% of people with diabetes in Africa are unaware of their condition, and the region has the highest percentage (73.1%) of diabetes-related deaths among individuals under 60 years of age (IDF, 2022). This high prevalence and lack of awareness underscore the urgent need for effective diabetes management strategies in these regions. T2DM often has an insidious onset and can remain undiagnosed for many years. Short-term complications of uncontrolled diabetes include hypoglycemia and hyperosmolar hyperglycemic nonketotic syndrome, while long-term complications develop over the years due to damage to blood vessels. These long-term complications include microvascular issues, such as retinopathy, nephropathy, and neuropathy, as well as macrovascular complications like cardiovascular diseases (American Diabetes Association [ADA], 2023). The onset and progression of atherosclerosis are much more rapid in individuals with diabetes than in those without diabetes. The increased prevalence of cardiovascular disease in patients with diabetes is preceded by a constellation of risk factors including dyslipidemia, hypertension, and obesity.

Lifestyle modifications are fundamental to managing T2DM effectively. Recommended lifestyle changes include engaging in at least two and a half hours of moderate-intensity physical activity per week or one hour and 15 minutes of high-intensity exercise, gradually losing weight to achieve a healthy body mass index, and replacing refined carbohydrates with whole grains while increasing the intake of vegetables and other high-fiber foods (WHO, 2022). These modifications help in maintaining normal blood glucose levels and preventing diabetes-related complications. Several lifestyle factors contribute significantly to the development and progression of T2DM, including poor diet, sedentary lifestyle, smoking, and excessive alcohol consumption (ADA, 2023). Smoking, in particular, is associated with a 45% higher risk of developing diabetes compared to non-smokers. Additionally, smoking contributes to truncal obesity, a known risk factor for insulin resistance and diabetes.

Despite the clear benefits of lifestyle modification in managing T2DM, its application and practice among patients are often inadequate. Intensive nutritional intervention, whether alone or combined with medication, is considered one of the most effective methods for improving glycemic control in T2DM (Malik et al., 2024). However, in clinical practice, dietary education is frequently not implemented as an integral part of diabetes management. As a result, many patients do not receive the necessary guidance to make effective lifestyle changes. Diabetes, a non-communicable metabolic disease, imposes several complications and deaths worldwide. Strict lifestyle modification can prevent the progression of complications associated with diabetes (Esubalew et al., 2024). There is much evidence to show that following a healthy lifestyle such as a healthy diet, moderate weight loss, and regular exercise can maintain normal blood glucose levels and minimize diabetes-related complications. Moreover, this lifestyle modification has a great impact on the control of hyperglycemia. Good knowledge, positive

attitude, and good practice towards lifestyle modification can help to maintain a normal blood glucose level. The growing prevalence of T2DM and its associated complications highlight the need for comprehensive management strategies that include lifestyle modification. Evidence shows that following a healthy lifestyle—comprising a balanced diet, moderate weight loss, and regular exercise—can maintain normal blood glucose levels and minimize the risk of complications (Yusuf Mohamud & Omar Jeele, 2022)

## **1.2 Statement of Problem**

The number of individuals suffering from Type 2 diabetes mellitus (T2DM) continues to rise globally, causing significant morbidity and mortality, particularly in developing countries. Behavior change and the adoption of healthy lifestyle habits can help prevent or slow down the complications of T2DM. However, knowledge and practice of healthy lifestyles among many diabetic patients have been inadequate (Teoh et al., 2023).

Diabetes is a chronic, metabolic disease characterized by elevated levels of blood glucose (or blood sugar), which leads to serious damage to the heart, blood vessels, eyes, kidneys, and nerves over time. The most common type is T2DM, usually found in adults, which occurs when the body becomes resistant to insulin or doesn't produce enough insulin (World Health Organization, 2022). Over the past three decades, the prevalence of T2DM has risen dramatically across countries of all income levels. For individuals living with diabetes, access to affordable treatment, including insulin, is critical for their survival (International Diabetes Federation, 2022). Globally, about 422 million people have diabetes, with the majority living in low- and middle-income countries. Approximately 1.5 million deaths are directly attributed to diabetes each year (WHO, 2023). Both the number of cases and the prevalence of diabetes have been steadily increasing over the past few decades, presenting a significant public health issue,

especially in sub-Saharan Africa (Bobga-Billa 2023). Nigeria, which now leads the region in diabetes prevalence, recorded a 4.3% prevalence of diabetes in 2016, with local studies reporting prevalence rates ranging between 0.8% and 11% (Adeleye, 2021). The surge in diabetes cases is alarming, with around 4.7 million Nigerians diagnosed with T2DM. Geopolitically, diabetes prevalence exhibits regional variations across Nigeria, with the southeastern zone recording the highest prevalence at 9.8%, followed by the northeastern zone at 5.9% (Usman et al., 2021).

T2DM accounts for over 90% of diabetes cases in Nigeria and contributes to a substantial number of deaths annually, estimated at over 40,000 in 2015 alone (Sylver-Francis et al., 2022). Inefficiencies in healthcare delivery further compound the situation, leaving millions undiagnosed and untreated (Aidoo, 2023). The International Diabetes Federation (IDF) estimates that two-thirds of people with diabetes in Africa remain undiagnosed, exacerbating the risk of debilitating complications such as stroke, heart attack, kidney failure, and blindness (IDF, 2021). Effective management of diabetes mellitus hinges significantly on patients' ability to engage in self-care practices in their daily lives (Alum 2025). However, a concerning trend persists where many diabetic patients present to hospitals with complications shortly after discharge, largely due to non-compliance with treatment regimens (Shalaeva et al., 2023). Due to these complications and the increasing prevalence and incidence of T2DM, preventing this disease process has become increasingly important. Several methods proven successful in preventing T2DM include lifestyle modifications such as weight loss, increased physical activity, and dietary changes (Tuomilehto et al., 2001). Both the DASH and Mediterranean diets have shown positive evidence in reducing the incidence of T2DM (Zhang et al., 2022). Additionally, moderate-to-intense physical activity (~30 minutes, 5 days per week) reduces the risk of developing both T2DM and coronary artery disease (Malik et al., 2024). Weight loss specifically

reduces the incidence of T2DM as it decreases insulin resistance, while tobacco cessation has been correlated with a reduction in coronary artery disease risk due to decreased pro-inflammatory and endothelial injury (Salimova et al., 2024). Addressing the knowledge and practice gaps related to lifestyle modifications among diabetic patients is crucial for effective diabetes management and the prevention of complications. This prompted the research to investigate the knowledge, attitudes, and practices regarding lifestyle modifications among T2DM patients is essential for effective disease management.

### **1.3 Aim of the Study**

The main objective of this study is to assess the knowledge, attitudes, and practices regarding lifestyle modifications among Type II diabetes mellitus (T2DM) patients attending the outpatient clinic at the University of Benin Teaching Hospital.

Specifically, the study aims to:

1. Assess the level of knowledge on lifestyle modifications among Type II diabetes mellitus (T2DM) patients attending the outpatient clinic at the University of Benin Teaching Hospital.
2. Ascertain the attitudes toward lifestyle modifications among Type II diabetes mellitus (T2DM) patients attending the outpatient clinic at the University of Benin Teaching Hospital.
3. Identify the lifestyle modifications practice among Type II diabetes mellitus (T2DM) patients attending the outpatient clinic at the University of Benin Teaching Hospital

4. Identify the barriers affecting the effective implementation of lifestyle modifications among Type II diabetes mellitus (T2DM) patients attending the outpatient clinic at the University of Benin Teaching Hospital

#### **1.4 Research Questions**

1. What is the level of knowledge of lifestyle modifications among Type II diabetes mellitus (T2DM) patients attending the outpatient clinic at the University of Benin Teaching Hospital?
2. What is the attitude of lifestyle modifications among Type II diabetes mellitus (T2DM) patients attending the outpatient clinic at the University of Benin Teaching Hospital?
3. What is the level of practice of lifestyle modifications among Type II diabetes mellitus (T2DM) patients attending the outpatient clinic at the University of Benin Teaching Hospital?
4. What are the barriers influencing the effective implementation of lifestyle modifications among Type II diabetes mellitus (T2DM) patients attending the outpatient clinic at the University of Benin Teaching Hospital?

#### **1.5 Research Hypothesis**

1. There is no significant relationship between the level of knowledge of lifestyle modification among Type II diabetes mellitus (T2DM) patients attending the outpatient clinic at the University of Benin Teaching Hospital and their socio-demographic characteristics.
2. There is no significant relationship between level of knowledge and attitude towards life style practices

3. There is no significant association between life style modifications practices and social demographic characteristics of the respondent's

## **1.6 Significance of Study**

### **To the Profession**

This study contributes to the professional field by enriching the body of knowledge regarding diabetes management, particularly in the context of lifestyle modifications for T2DM patients. By highlighting the current levels of knowledge, attitudes, and practices among patients, the findings can inform the development of more effective educational programs and guidelines tailored to the needs of T2DM patients. Moreover, the insights gained from this study can guide future research, fostering a deeper understanding of the interplay between lifestyle factors and diabetes outcomes, ultimately leading to improved treatment protocols and patient care strategies.

### **To Healthcare Providers**

Healthcare providers, including doctors, nurses, and dietitians, will benefit from the study by gaining a clearer picture of the challenges and barriers faced by T2DM patients in adopting healthy lifestyle practices. The findings can help healthcare professionals tailor their patient education and counseling strategies to address specific gaps in knowledge and negative attitudes, thereby enhancing patient adherence to recommended lifestyle modifications. This, in turn, can improve patient outcomes, reduce the incidence of diabetes-related complications, and enhance the overall effectiveness of diabetes management programs.

## **To the Institution**

For the University of Benin Teaching Hospital, this study underscores the institution's commitment to advancing healthcare through research and improving patient outcomes. The findings can inform the development of institution-specific programs and policies aimed at enhancing diabetes care and education. Additionally, the study can serve as a benchmark for evaluating the effectiveness of current practices and identifying areas for improvement. By addressing the unique challenges faced by its patient population, the hospital can better serve its community and solidify its reputation as a leader in diabetes care and management.

## **To the Society**

The study has significant implications for society at large by promoting greater awareness of the importance of lifestyle modifications in managing T2DM. By identifying key areas where patients struggle with knowledge and practice, the study can inform public health campaigns and community-based interventions designed to encourage healthier living. Improved management of diabetes at the individual level can lead to a reduction in the societal burden of the disease, including decreased healthcare costs and improved quality of life for individuals living with T2DM and their families.

### **1.7 Scope of Study**

This study is focused on exploring the knowledge, attitudes, and practices regarding lifestyle modifications among Type II diabetes mellitus (T2DM) patients attending the outpatient clinic at the University of Benin Teaching Hospital (UBTH). The study targets T2DM patients receiving outpatient care at UBTH. This includes adults diagnosed with T2DM who are attending regular follow-up appointments at the hospital's diabetes clinic. The research is confined to the

University of Benin Teaching Hospital in Benin City, Nigeria. This specific setting provides a representative sample of patients within this region, allowing for insights that are particularly relevant to the local context.

### **1.8 Operational Definition of Terms**

This study aims to assess the knowledge levels, attitudes, and practices related to lifestyle modifications among T2DM patients attending the outpatient clinics at UBTH. By identifying gaps and barriers, this research seeks to inform targeted strategies that can enhance patient education, promote behaviour change, and ultimately contribute to better diabetes management in the local context. Here are the operational definitions of key terms

- **Type II Diabetes Mellitus (T2DM):** refers to a chronic metabolic disorder characterized by elevated blood glucose levels due to insulin resistance and relative insulin deficiency. In this study, T2DM specifically includes patients diagnosed with diabetes mellitus type 2 attending outpatient clinics at the University of Benin Teaching Hospital.
- **Knowledge:** refers to the understanding and awareness of T2DM, its causes, symptoms, complications, and management strategies, including lifestyle modifications such as diet, exercise, medication adherence, and regular medical check-ups.
- **Attitudes:** refer to the beliefs, perceptions, and emotional responses of T2DM patients towards their condition and recommended lifestyle modifications. This includes their willingness, motivation, and self-efficacy in adopting and maintaining healthy behaviors.
- **Practices:** refer to the actual behaviors and actions taken by T2DM patients in their daily lives to manage their condition. This encompasses adherence to prescribed medications,

dietary habits, physical activity levels, self-monitoring of blood glucose, and regular attendance at medical appointments.

- **Lifestyle Modifications:** Lifestyle modifications include changes in diet (e.g., reducing sugar and carbohydrate intake, increasing fiber consumption), physical activity (e.g., regular exercise routines), smoking cessation, alcohol moderation, and stress management techniques adopted by T2DM patients to improve their health outcomes.

## CHAPTER TWO

### LITERATURE REVIEW

This chapter focuses on the review of associated literature on knowledge and practices regarding lifestyle modification among Type 1 DM patients, including conceptual review, theoretical review, empirical review and summary of the review.

#### 2.1 Conceptual Review

##### 2.1.1 Overview of Type 2 Diabetes Mellitus

Diabetes mellitus is a chronic metabolic disorder characterized by persistent hyperglycemia resulting from defects in insulin secretion, insulin action, or both. The condition disrupts normal carbohydrate, fat, and protein metabolism due to inadequate insulin production or the body's inability to use insulin effectively (Abiodun et al., 2024; Adeleye, 2021).

There are several types of diabetes mellitus, each with distinct pathophysiological mechanisms and clinical manifestations. The primary types include:

**Type 1 Diabetes Mellitus (T1DM):** This form of diabetes is an autoimmune condition where the body's immune system attacks and destroys the insulin-producing beta cells in the pancreas. It typically manifests in childhood or adolescence, although it can occur at any age. Individuals with T1DM require lifelong insulin therapy for survival (Alaofè et al., 2021).

**Type 2 Diabetes Mellitus (T2DM):** The most common form of diabetes, T2DM, primarily involves insulin resistance and a relative insulin deficiency. It is strongly associated with obesity, sedentary lifestyle, and poor dietary habits. Unlike T1DM, T2DM usually develops in adults

over 45, but its prevalence is increasing among younger populations due to rising obesity rates (Adhikari et al., 2021; Abiodun et al., 2024).

**Gestational Diabetes Mellitus (GDM):** This type of diabetes occurs during pregnancy and usually resolves after childbirth. However, women with GDM and their offspring are at increased risk of developing T2DM later in life (Aje & Fakeye, 2024).

**Other Specific Types:** There are several other specific types of diabetes that result from genetic defects, endocrinopathies, or drug-induced conditions. These include monogenic diabetes syndromes, such as neonatal diabetes and maturity-onset diabetes of the young (MODY), as well as diabetes secondary to diseases like cystic fibrosis or conditions like Cushing's syndrome (Almheiri et al., 2024).

Understanding the various types of diabetes mellitus is crucial for developing appropriate management and treatment strategies. Each type has distinct etiologies, clinical presentations, and therapeutic requirements, necessitating tailored approaches to care. The increasing prevalence of T2DM, particularly in low- and middle-income countries, highlights the urgent need for effective public health interventions to address this growing global health challenge (Adeleye, 2021; Bobga Billa, 2023).

### **2.1.2 Pathophysiology of Type II Diabetes Mellitus (T2DM)**

Type II diabetes mellitus (T2DM) is a chronic condition characterized by insulin resistance and relative insulin deficiency, leading to hyperglycemia (Abiodun et al., 2024). The pathophysiology of T2DM involves a complex interplay between genetic, environmental, and lifestyle factors, contributing to the progressive deterioration of glucose homeostasis (Adeleye, 2021).

### **2.1.2.1 Insulin Resistance**

The hallmark of T2DM is insulin resistance, a condition in which the body's cells become less responsive to insulin. Insulin is a hormone produced by the beta cells of the pancreas that facilitates the uptake of glucose into cells for energy production. In T2DM, the cells of the liver, muscle, and adipose tissue do not respond effectively to insulin, resulting in decreased glucose uptake and increased blood glucose levels (Castillo et al., 2025).

Insulin resistance is often associated with obesity, particularly central or visceral obesity, where fat is accumulated around the abdomen (Alenbalu et al., 2024). Adipose tissue, especially visceral fat, secretes various bioactive substances known as adipokines, which can impair insulin signaling pathways. Visceral adiposity is a major contributor to insulin resistance through the release of pro-inflammatory cytokines and free fatty acids that interfere with insulin action (Alfulayw et al., 2022).

### **2.1.2.2 Pancreatic Beta-Cell Dysfunction**

As insulin resistance progresses, the pancreatic beta cells initially compensate by increasing insulin production. However, over time, the beta cells become dysfunctional and fail to secrete adequate insulin to maintain normal blood glucose levels (Almheiri et al., 2024). This progressive beta-cell dysfunction is a critical component in the development and worsening of T2DM (Afsaneh et al., 2022).

The decline in beta-cell function is influenced by several factors, including genetic predisposition, glucotoxicity (chronic high blood glucose levels), and lipotoxicity (elevated levels of free fatty acids). Additionally, oxidative stress and inflammation play significant roles

in beta-cell damage. Oxidative stress is a key factor in the pathogenesis of beta-cell dysfunction in T2DM (Alkali et al., 2024).

### **2.1.2.3 Hepatic Glucose Production**

In T2DM, the liver contributes to hyperglycemia through increased hepatic glucose production, primarily due to insulin resistance. Normally, insulin suppresses glucose production in the liver; however, in T2DM, this suppression is impaired, leading to excessive glucose output (Alrasheeday et al., 2024). This exacerbates fasting hyperglycemia and contributes to overall glycemic imbalance.

### **2.1.2.4 Incretin Effect**

Incretins are hormones released from the gut in response to food intake that enhance insulin secretion from the pancreas. The two main incretins are glucagon-like peptide-1 (GLP-1) and glucose-dependent insulinotropic peptide (GIP). In T2DM, the incretin effect is diminished, leading to inadequate insulin release following meals (Alum, 2025).

### **2.1.2.5 Genetic and Environmental Factors**

Genetic predisposition plays a significant role in the development of T2DM. Individuals with a family history of diabetes are at a higher risk of developing the condition (Aje & Fakeye, 2024). Specific genetic variants have been identified that influence insulin sensitivity, beta-cell function, and glucose metabolism.

Environmental factors, including diet, physical inactivity, and socioeconomic status, also contribute to the development of T2DM (Adhikari et al., 2021). Poor dietary habits, such as high

intake of refined carbohydrates and saturated fats, and a sedentary lifestyle are major risk factors (Goyal & Rakhra, 2024).

The pathophysiology of T2DM is multifaceted, involving insulin resistance, beta-cell dysfunction, increased hepatic glucose production, and impaired incretin function. Genetic and environmental factors further influence the onset and progression of the disease. Understanding these mechanisms is crucial for developing effective treatment strategies and managing T2DM, which remains a significant public health challenge worldwide (Bobga Billa, 2023).

### **2.1.3.2 Regional Prevalence and Incidence**

#### **2.1.3.2.1 Sub-Saharan Africa**

In Sub-Saharan Africa, the prevalence of T2DM is rising rapidly due to urbanization, changing dietary patterns, and increasing obesity rates (Bobga Billa, 2023). The prevalence rate ranges from 1% to 16%, with significant regional variations. The prevalence of diabetes in Nigeria is a growing concern, necessitating urgent public health interventions (Adeleye, 2021; Abiodun et al., 2024).

#### **2.1.3.2.2 Middle East and North Africa**

The Middle East and North Africa (MENA) region has some of the highest diabetes prevalence rates globally. The prevalence of diabetes in this region is expected to increase significantly by 2045. Factors such as high rates of obesity, sedentary lifestyles, and genetic predisposition contribute to this trend (Alrasheeday et al., 2024).

#### **2.1.3.2.3 South Asia**

South Asia, including countries like India, Pakistan, and Bangladesh, faces a significant diabetes burden. India, in particular, is home to a large number of individuals with T2DM. The prevalence of diabetes in India was estimated to be around 8.9% in 2019, with projections indicating a continued rise (Khan & Yousuf, 2024).

#### **2.1.3.2.4 Europe**

Europe has a relatively high prevalence of T2DM, with variations across different countries. In the United Kingdom, for instance, about 4 million people are living with diabetes, and this number is projected to exceed 5 million by 2030. Diabetes is potentially the most significant health crisis the UK has faced in 20 years (Malik et al., 2024).

#### **2.1.3.2.5 North America**

In North America, particularly in the United States and Canada, T2DM prevalence continues to grow. In 2018, approximately 34.2 million Americans had diabetes, representing 10.5% of the population. Lifestyle factors, such as poor diet and lack of physical activity, are major contributors to the high prevalence rates in this region (Goyal & Rakhra, 2024).

#### **2.1.3.3 Economic Impact**

The global and regional prevalence and incidence of T2DM highlight the urgent need for effective public health strategies to combat this growing epidemic. With millions of individuals affected worldwide and significant economic implications, addressing the modifiable risk factors, promoting early diagnosis, and ensuring effective management of T2DM are critical to mitigating its impact (Aidoo, 2023).

## **2.1.4 Lifestyle Modifications in Diabetes Management**

Lifestyle modifications play a crucial role in managing Type II Diabetes Mellitus (T2DM). These modifications, which include dietary changes, increased physical activity, and weight management, are fundamental to controlling blood glucose levels and reducing the risk of complications associated with diabetes (Alfulayw et al., 2022).

### **2.1.4.1 Dietary Modifications**

Dietary interventions are central to the management of T2DM. Proper nutrition helps to regulate blood sugar levels and can prevent or delay the onset of diabetes complications (Gebeyehu et al., 2022). A healthy diet for individuals with T2DM typically includes:

**Balanced Macronutrients:** Consuming a balanced diet with an appropriate mix of carbohydrates, proteins, and fats helps maintain stable blood sugar levels (Lotfy et al., 2022).

**Fiber-Rich Foods:** High-fiber foods, such as fruits, vegetables, and whole grains, improve insulin sensitivity and help maintain blood sugar levels (Ariyo et al., 2023).

**Reduced Sugar and Refined Carbohydrates:** Limiting the intake of sugary drinks, sweets, and refined grains helps in managing blood glucose levels (Mahzari et al., 2022).

**Dietary Interventions:** Implementing dietary interventions can significantly improve glycemic control in individuals with T2DM (Ernawati et al., 2021).

### **2.1.4.2 Physical Activity**

Regular physical activity is another key component in managing T2DM. Exercise helps to increase insulin sensitivity, improve cardiovascular health, and promote weight loss (Hilmarsdóttir et al., 2021). Recommendations for individuals with T2DM include:

**Aerobic Exercise:** Activities such as walking, cycling, and swimming for at least 150 minutes per week help improve cardiovascular health and glucose metabolism (Almomani & Al-Tawalbeh, 2022).

**Resistance Training:** Incorporating resistance training exercises at least two to three times per week helps to build muscle mass, which can improve insulin sensitivity (Castillo et al., 2025).

**Consistency:** Regular and consistent physical activity is more beneficial than sporadic intense exercise sessions (Kumar et al., 2024).

#### **2.1.4.3 Weight Management**

Maintaining a healthy weight is crucial for individuals with T2DM. Obesity is a major risk factor for the development and progression of T2DM, and weight loss can significantly improve insulin sensitivity and glycemic control (Okafor & Hlabyago, 2023). Strategies for weight management include:

**Caloric Restriction:** Reducing calorie intake, particularly from high-fat and high-sugar foods, helps in weight loss and improves metabolic health (Mansy et al., 2022).

**Behavioral Interventions:** Techniques such as self-monitoring, goal setting, and behavioral therapy can support weight loss efforts (Mekonnen & Hussien, 2021).

**Long-Term Maintenance:** Weight management should be a continuous effort, involving regular physical activity and a balanced diet to prevent weight regain (Adhikari et al., 2021).

**Support Systems:** Engaging with support groups, healthcare providers, and diabetes educators can provide motivation and guidance for weight management (Gutta et al., 2024).

#### **2.1.4.4 Smoking Cessation**

Smoking cessation is essential for individuals with T2DM due to its impact on blood glucose levels and cardiovascular health (Alduraywish et al., 2022).

**Impact on Diabetes Management:** Smoking exacerbates insulin resistance, impairs glucose metabolism, and increases the risk of cardiovascular complications (Muhammad et al., 2021).

**Benefits of Quitting:** Stopping smoking improves insulin sensitivity, reduces the risk of heart disease, and enhances overall health. Smoking cessation programs and support from healthcare providers are crucial in this process (Esubalew et al., 2024).

#### **2.1.5 Impact on Health Outcomes**

The importance of lifestyle modifications in managing T2DM cannot be overstated. Proper diet, regular exercise, and maintaining a healthy weight can lead to:

**Improved Glycemic Control:** Better blood sugar management reduces the risk of diabetes-related complications (Almomani & Al-Tawalbeh, 2022).

**Cardiovascular Health:** Lowering blood pressure and cholesterol levels, and reducing cardiovascular risks are significant benefits of lifestyle modifications (Alkali et al., 2024).

**Enhanced Quality of Life:** Improved physical and mental well-being, reduced dependence on medications, and better overall health outcomes are associated with lifestyle changes (Esubalew et al., 2024).

Lifestyle modifications are integral to the management of T2DM. Dietary changes, increased physical activity, and effective weight management strategies not only help in controlling blood glucose levels but also improve overall health and reduce the risk of complications. The evidence

underscores the need for individuals with T2DM to adopt and maintain these lifestyle changes to achieve better health outcomes (Alfulayw et al., 2022; Mohamud, 2022).

### **2.1.6 Barriers to Effective Lifestyle Modifications**

Implementing lifestyle modifications is crucial for the effective management of Type II Diabetes Mellitus (T2DM). However, numerous barriers can hinder the adoption and sustainability of these changes among patients. Understanding these barriers is essential for developing strategies to improve adherence and overall diabetes management (Adhikari et al., 2021).

#### **2.1.6.1 Common Barriers to Adopting Lifestyle Changes**

One of the primary barriers to adopting lifestyle changes is a lack of knowledge. Many T2DM patients do not fully understand the significance of lifestyle modifications or how to implement them effectively (Aje & Fakeye, 2024). This knowledge gap can result in poor dietary choices, insufficient physical activity, and inadequate management of diabetes.

The complexity of lifestyle changes is another significant barrier. The multifaceted nature of lifestyle modifications—such as altering dietary habits, initiating an exercise regimen, and managing weight—can be overwhelming for patients (Alrasheedday et al., 2024). The perception that these changes are too difficult or complicated can deter individuals from attempting them. The adjustment to new routines requires considerable effort, and without clear guidance, many patients find it challenging to incorporate these changes into their daily lives.

Inconsistent motivation is a crucial factor affecting adherence to lifestyle changes. Motivation can fluctuate, and patients often struggle to maintain commitment over the long term, particularly when immediate results are not visible (Joho, 2023). The journey to effectively manage diabetes through lifestyle changes requires sustained motivation, which can be

challenging to achieve without visible improvements in health or support from healthcare providers.

#### **2.1.6.2 Cultural, Socio-Economic, and Psychological Factors**

Cultural factors play a significant role in shaping patients' dietary habits and attitudes toward health management. Traditional cultural practices and beliefs may conflict with recommended dietary guidelines for managing diabetes (Alaofè et al., 2021). For instance, in some cultures, certain foods that are commonly consumed may not align with the dietary modifications necessary for diabetes control. This cultural dissonance can create resistance to dietary changes, making adherence to recommended lifestyle modifications more challenging.

Socio-economic factors also significantly impact the ability to adopt lifestyle modifications (Aidoo, 2023). Economic constraints can limit access to healthy foods, exercise facilities, and diabetes management resources. Patients from lower socio-economic backgrounds may face higher food costs, limited availability of gyms or fitness centers, and reduced access to diabetes education programs. These financial barriers can make it difficult for patients to follow recommended lifestyle changes and manage their condition effectively.

Psychological factors such as depression, anxiety, and stress can impede patients' ability to make and sustain lifestyle changes. Psychological issues often affect motivation, self-care behaviors, and overall health management (Alum, 2025). Patients struggling with mental health challenges may find it difficult to maintain the necessary lifestyle modifications, which are essential for effective diabetes management.

## 2.2 Theoretical framework

### **The Health Belief Model was adopted in this study**

The Health Belief Model (HBM) is a psychological framework that helps explain and predict health-related behaviors by focusing on the attitudes and beliefs of individuals. Developed in the 1950s by social psychologists Irwin M. Rosenstock, Godfrey Hochbaum, and others, the HBM was initially created to understand why people failed to participate in programs that could help prevent and detect disease. The model has since been widely used to design public health interventions and understand health behaviors.

### **Key Components of the Health Belief Model**

#### **Perceived Susceptibility:**

- **Understanding Risk:** Patients with Type II diabetes need to understand their personal risk of developing complications if they do not manage their condition properly. This involves recognizing factors like family history, lifestyle choices, and their current health status.
- **Education and Awareness:** Healthcare providers can use educational tools and resources to inform patients about the nature of diabetes, its progression, and the potential risks associated with poor management.
- **Personalized Assessments:** Individual risk assessments can be conducted to help patients understand their specific risk levels, which may increase their perception of susceptibility.

### **Perceived Severity:**

- **Medical Consequences:** Educating patients about the severe medical outcomes of uncontrolled diabetes, such as heart disease, stroke, kidney failure, neuropathy, and retinopathy, can highlight the importance of managing their condition.
- **Social Consequences:** Patients should be made aware of the social implications, including the impact on their ability to work, engage in social activities, and maintain relationships.
- **Emotional Impact:** Addressing the emotional and psychological burden of living with chronic complications can also help patients perceive the seriousness of their condition.

### **Perceived Benefits**

- **Improved Health Outcomes:** Patients need to understand how lifestyle modifications, such as a balanced diet and regular exercise, can lead to better blood sugar control and reduce the risk of complications.
- **Enhanced Quality of Life:** Emphasizing the potential improvements in daily functioning, energy levels, and overall well-being can motivate patients to adopt healthier behaviors.
- **Preventive Measures:** Highlighting how preventive actions can delay or prevent the onset of complications can encourage proactive behavior.
- **Cost Savings:** Demonstrating the potential cost savings from avoiding medical treatments and hospitalizations due to complications can be a strong motivator for some patients.

## Perceived Barriers

- **Financial Constraints:** Addressing the cost of healthy foods, gym memberships, and medical supplies is essential. Providing information on affordable alternatives or financial assistance programs can help mitigate these concerns.
- **Time Management:** Many patients struggle to find time for exercise and meal planning. Offering practical tips for integrating these activities into their daily routine can help.
- **Lack of Knowledge:** Some patients may lack the necessary knowledge to make healthy lifestyle choices. Providing education and resources on nutrition, exercise, and medication management is crucial.
- **Support Systems:** Patients often need support from family, friends, and healthcare providers. Encouraging the development of a support network can help patients overcome barriers.

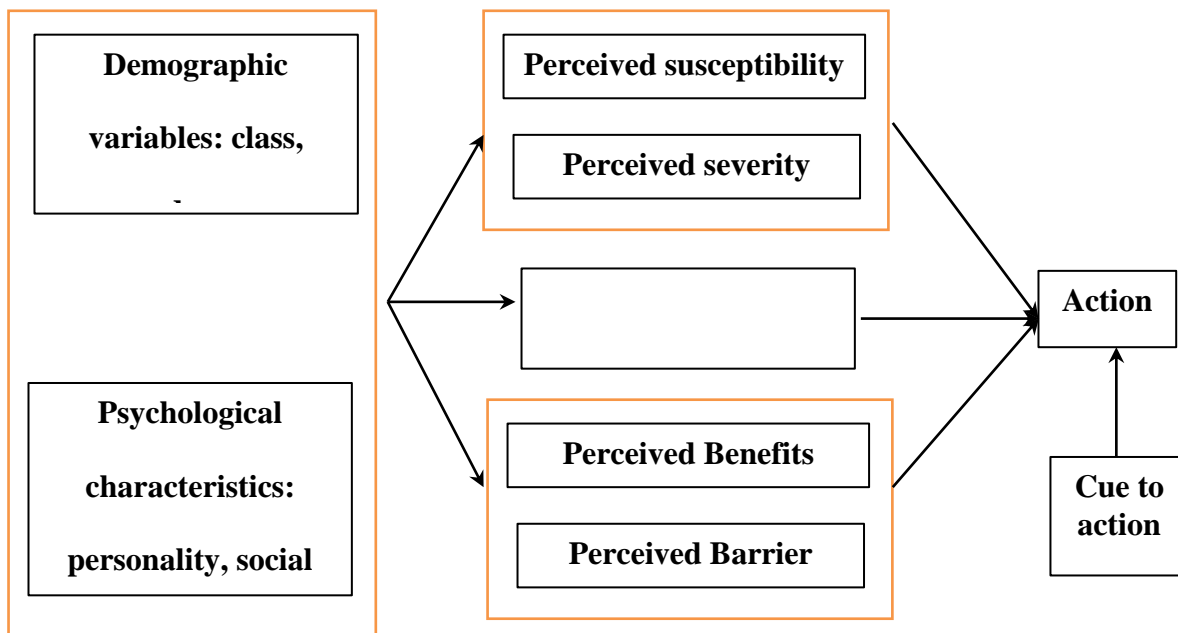
## Cue to Action

- **Internal Cues:** Symptoms like fatigue, frequent urination, or high blood sugar readings can serve as internal cues that prompt patients to take action. Helping patients recognize these symptoms can increase their responsiveness.
- **External Cues:** External reminders such as scheduled appointments, follow-up calls, educational materials, and support group meetings can encourage patients to stay on track with their lifestyle modifications.
- **Health Campaigns:** Public health campaigns and community programs that focus on diabetes management can provide additional motivation and support.

- **Technology:** Utilizing mobile apps, wearable devices, and online platforms can provide continuous monitoring and reminders for patients.

### **Self-Efficacy**

- **Skill Building:** Providing patients with the skills they need to manage their diabetes, such as cooking healthy meals, reading food labels, and developing an exercise routine, can boost their confidence.
- **Goal Setting:** Helping patients set realistic and achievable goals can improve their sense of self-efficacy. Celebrating small successes can reinforce positive behavior.
- **Supportive Environment:** Creating a supportive environment, both at home and in the healthcare setting, can enhance patients' confidence in their ability to manage their condition.
- **Access to Resources:** Ensuring patients have access to the necessary resources, such as educational materials, support groups, and professional guidance, can empower them to take control of their health.



**Figure 1: Basic elements of the health belief model**

### **Application of HBM**

By applying the Health Belief Model (HBM), the study intends to understand the factors influencing these patients' behaviors and to develop targeted interventions that can enhance their management of diabetes. Understanding patients' recognition of their risk of diabetes complications is crucial. Survey questions will assess their beliefs about personal risk, and educational sessions will clarify their understanding of susceptibility. Awareness of the serious consequences of unmanaged diabetes is vital. The study will evaluate their understanding through questionnaires and emphasize the health and social implications of poor diabetes management. Patients need to see the health benefits of lifestyle changes, such as better blood sugar control. The study will assess their beliefs through surveys and highlight these benefits to motivate healthier behaviors. Understanding that lifestyle changes can improve daily life and energy levels is important. The study will explore these perceptions to encourage positive lifestyle adjustments. Identifying financial barriers through questions about affordability will help in providing information on cost-effective options. Assessing time-related challenges and

offering practical integration tips will support patients in managing their diabetes effectively. Evaluating knowledge gaps and providing targeted education on nutrition, exercise, and medication is essential. Assessing the support from family and healthcare providers will help in encouraging a supportive network for patients. Monitoring symptoms and using external reminders like appointments and educational materials will prompt patients to take action. Health campaigns and technology can provide additional motivation and support. Providing skills for managing diabetes and helping patients set achievable goals will boost their confidence. The study will evaluate these factors to reinforce positive behavior. Creating a supportive environment and ensuring access to resources will empower patients to manage their condition effectively. Applying the Health Belief Model in this study enables a deeper understanding of the factors influencing lifestyle modifications among Type II diabetes mellitus patients, leading to more effective, patient-centered interventions and improved health outcomes.

## **2.3 Empirical review**

### **2.3.1 Knowledge on Lifestyle Modifications among Type II diabetes mellitus (T2DM) patients**

In a study conducted by Abiodun et al., (2024) on the factors influencing knowledge and performance of self-care practices among Type 2 Diabetes Mellitus (T2DM) patients in a teaching hospital in Nigeria, a descriptive cross-sectional design was employed. The study was carried out in a tertiary health facility in Ondo State, Nigeria, involving 132 T2DM patients attending the endocrine clinic. Participants were selected using convenience sampling, and data were collected through a structured questionnaire and a self-care performance recall form. Descriptive statistics were used for analysis, while hypotheses were tested using Binary Logistic

Regression at a 0.05% significance level. The findings revealed that an individual's belief in innate ability (OR= 2.871) and self-efficacy (OR= 2.121) were twice more likely to be associated with an increased level of knowledge of self-care practices. Similarly, beliefs and attitudes about life (OR= 2.533) and knowledge of the disease process and severity (OR= 2.706) were significantly associated with better performance of self-care practices. The study concluded that knowledge and performance of self-care practices among the participants were poor. It recommended strengthening factors that enhance knowledge and self-care performance as they positively impact outcomes in T2DM patients.

Aje and Fakeye (2024) conducted a multicenter study to examine the factors associated with disease knowledge and attitude among ambulatory patients with T2DM in Nigeria. A cross-sectional design was employed across three tertiary healthcare facilities: Federal Medical Center, Abeokuta; University College Hospital, Ibadan; and University of Ilorin Teaching Hospital, Ilorin. Data were collected from 188 diabetes patients using an interviewer-administered semi-structured questionnaire, and statistical analyses were conducted at a significance level of  $p < 0.05$ . Results showed that 51 (27.1%) participants were from Federal Medical Center, 69 (36.7%) from University College Hospital, and 68 (36.2%) from University of Ilorin Teaching Hospital. The majority of participants (59.6%) were female, with a mean age of  $58.69 \pm 13.68$  years. Medication discrepancy was observed among 101 (53.7%) patients, and 54.8% had high medication adherence. Mean diabetes knowledge was  $14.64 \pm 2.55$  out of 18, while diabetes attitude scored  $62.50 \pm 6.86$  out of 70. A significant association was found between diabetes knowledge and health literacy (Beta=0.021,  $p=0.029$ ). Knowledge was higher among patients with a higher level of education ( $p=0.046$ ) and high health literacy ( $p=0.002$ ). Attitude was significantly better in older patients ( $p=0.029$ ) and those with high health literacy ( $p=0.005$ ). The

study concluded that patients displayed good knowledge, attitude, and medication adherence, but moderate health literacy and medication discrepancies required further intervention.

Alaofè et al., (2021) assessed the knowledge, attitude, and practices (KAP) of diabetic patients in Cotonou, southern Benin, and identified associated factors. A cross-sectional study was conducted between July and August 2019 among 300 diabetic patients from four health centers. Data were collected using validated questionnaires, and KAP scores were analyzed through multivariate logistic regression. The results indicated that 53% of participants had good knowledge, 52% had a positive attitude, and 47% demonstrated good practices regarding diabetes. Significant predictors of good knowledge included being female, married, educated, employed, and having a longer duration of diabetes. Similarly, good attitude was significantly associated with being married, having a longer duration of diabetes, and good knowledge, while good practice was linked to being educated, having a longer duration of diabetes, and good knowledge. The study concluded that gaps in knowledge, attitude, and practice persist in the diabetic community, underscoring the need for structured educational programs, particularly targeting men, newly diagnosed patients, and those with lower education levels.

In South Africa, Alenbalu et al., (2024) examined diabetes-related KAP among T2DM patients attending primary healthcare clinics in Kimberley. A cross-sectional analytical study utilizing a quantitative questionnaire-based approach was conducted in Sol Plaatje Municipality using convenience sampling. A total of 363 participants were enrolled, with 62.0% being female. The results showed that 67.5% had good knowledge, 64.5% had positive attitudes, but only 35.8% demonstrated good diabetes management practices. There was a significant association between educational level and both knowledge ( $p=0.002$ ) and practice ( $p=0.0075$ ), but no significant link

between education and attitudes ( $p=0.2416$ ). The study concluded that while knowledge and attitudes were relatively strong, self-care practices were inadequate. It recommended implementing educational programs to improve diabetes management behaviors.

Lastly, a study by Alenbalu et al. (2024) assessed the knowledge, attitude, and compliance (KAC) of T2DM patients regarding dietary recommendations in Nigeria. A cross-sectional study was conducted at the Medical Outpatient Clinic of the University College Hospital, Ibadan, involving 101 diabetes patients. Data were collected using a semi-structured, interviewer-administered questionnaire. Knowledge was measured on a 26-point scale, attitude on a 34-point scale, and compliance on a 42-point scale. Participants with a knowledge score  $\geq 18$  were classified as having good knowledge, those scoring  $\geq 27$  on attitude were considered positive, and compliance scores  $\geq 29$  were classified as good. Results revealed that 49.5% of participants had a normal BMI, 30.7% were overweight, and 16% were obese. The study concluded that while knowledge and attitude towards dietary recommendations were satisfactory, compliance was suboptimal. It suggested that tailored interventions focusing on dietary adherence should be emphasized for better diabetes management outcomes.

### **2.3.2 Attitudes toward lifestyle modifications among Type II diabetes mellitus (T2DM) patients**

In a study conducted by Aje and Fakeye (2024) in Nigeria, the researchers assessed factors associated with disease knowledge and attitude among ambulatory patients with type 2 diabetes. The study employed a cross-sectional design and utilized an interviewer-administered semi-structured questionnaire for data collection. Data analysis was carried out using descriptive and inferential statistics, with significance set at  $p < 0.05$ . A total of 188 diabetes patients participated

in the study across three healthcare facilities: Federal Medical Center, Abeokuta (51 patients), University College Hospital, Ibadan (69 patients), and University of Ilorin Teaching Hospital, Ilorin (68 patients). Among the participants, 59.6% were female, and the mean age was 58.69 years. Results indicated that 53.7% experienced medication discrepancies, while 54.8%, 25%, and 20.2% reported high, medium, and low medication adherence, respectively. Additionally, 48.4% had high health literacy. Mean diabetes knowledge and attitude scores were 14.64 out of 18 points and 62.50 out of 70 points, respectively. A significant positive association was found between diabetes knowledge and health literacy ( $p = 0.029$ ). Diabetes knowledge was significantly higher among patients with higher levels of formal education ( $p = 0.046$ ), higher diabetes attitude scores ( $p < 0.001$ ), and high health literacy ( $p = 0.002$ ). Patients' attitude was positively associated with being over 60 years old ( $p = 0.029$ ) and high health literacy ( $p = 0.005$ ). The study concluded that participants displayed good diabetes knowledge, attitude, and medication adherence, while significant differences were observed based on education, health literacy, and age.

Alaofè et al. (2021) conducted a cross-sectional study in Cotonou, Southern Benin, from July to August 2019 to assess knowledge, attitude, and practice (KAP) among 300 diabetic patients attending four healthcare centers. Data was collected using validated questionnaires, and KAP scores were calculated. Multivariate logistic regression was employed to identify significant factors influencing KAP. The study found that 53%, 52%, and 47% of participants demonstrated good knowledge, attitude, and practice toward diabetes, respectively. Factors such as being female, married, educated, employed (government or non-government), and having a longer duration of diabetes were significantly associated with good knowledge. A good attitude was significantly linked to being married, having a longer duration of diabetes, and possessing good

knowledge. Good practice was significantly associated with education, longer diabetes duration, and good knowledge. The authors concluded that gaps in knowledge, attitude, and practice required structured educational programs, particularly targeting males, newly diagnosed patients, and those with limited education.

In a study conducted by Almheiri et al. (2024) at the Dubai Diabetes Center, the researchers examined knowledge, attitude, and practice regarding insulin therapy among 350 participants with type 2 diabetes receiving insulin therapy. The study adopted a cross-sectional design, with data collected via face-to-face interviews conducted using structured questionnaires. Participants included those aged 18 and above, excluding patients with type 1 diabetes, pregnant women with gestational diabetes, and individuals with a history of dementia. The median age of participants was 61 years, with 35.7% males and 64.3% females. The median percentage scores for knowledge, attitude, and practice were 62.5%, 85.7%, and 77.7%, respectively. Participants with higher education displayed better knowledge levels. Significant negative correlations were identified between knowledge scores and participants' age ( $r = -0.182$ ,  $p < 0.001$ ) and between attitude scores and haemoglobin A1C levels ( $r = -0.14$ ,  $p = 0.008$ ). A positive correlation was also identified between knowledge and practice scores ( $r = 0.123$ ,  $p = 0.021$ ). The study concluded that participants exhibited adequate knowledge, positive attitudes, and correct practices concerning insulin therapy, although gaps remained between knowledge and behavior.

Similarly, Hailu et al. (2021) conducted a cross-sectional study at the Adult Endocrine Clinic of St. Paul Hospital Millennium Medical College (SPHMMC) in Ethiopia. The study, carried out from January to March 2021, aimed to assess the knowledge and attitudes of 271 T2DM patients regarding insulin therapy. Data collection involved structured interviews using a validated

questionnaire. The mean age of participants was 57.35 years, and 85.2% resided in urban areas. Findings revealed that 85.6% had poor knowledge of insulin therapy, and 37.6% exhibited negative attitudes. Factors associated with knowledge included age, occupation, and a history of long-term oral antidiabetic drug use. Marital status and a family history of insulin use were linked to patients' attitudes. The study concluded that significant knowledge gaps existed, underscoring the need for structured educational programs delivered by trained healthcare professionals to improve insulin-related knowledge and attitudes among T2DM patients.

### **2.3.3 Lifestyle Modifications Practice among Type II diabetes mellitus (T2DM) patients**

In a study conducted by Abiodun et al. (2024), the factors influencing knowledge and performance of self-care practices among patients with Type 2 Diabetes Mellitus (T2DM) in a teaching hospital in Nigeria were examined. The study employed a descriptive cross-sectional design and was conducted in a tertiary health facility in Ondo State, Nigeria. A total of 132 participants, who were T2DM patients attending the endocrine clinic, were selected using convenience sampling. Data collection involved a structured questionnaire and a self-care performance recall form. Descriptive statistics were used for data analysis, while the hypothesis was tested using Binary Logistics Regression at a 0.05 significance level. The findings revealed that an individual's belief in innate ability (OR = 2.871) and self-efficacy (OR = 2.121) were twice more likely to be associated with increased levels of knowledge of self-care practices. Similarly, beliefs and attitudes about life (OR = 2.533) and knowledge of the disease process and severity (OR = 2.706) were twice more likely to be linked with better performance of self-care practices. The study concluded that knowledge of self-care practices and their performance were

generally poor among participants. Therefore, factors that positively influence knowledge and self-care performance should be strengthened to improve outcomes in patients with T2DM.

Alaofè et al. (2021) conducted a cross-sectional study in Cotonou, southern Benin, to assess the knowledge, attitude, and practice (KAP) of diabetic patients and identify associated factors. The study was carried out between July and August 2019 among 300 diabetic patients across four health centers. Data were collected using validated questionnaires, and KAP scores were determined. Multivariate logistic regression was used to analyze the factors influencing KAP scores. The results showed that 53% of patients had good knowledge, 52% had a good attitude, and 47% demonstrated good practices towards diabetes management. Factors such as being female, married, educated, employed in government or non-government sectors, and having a longer duration of diabetes were significantly associated with good knowledge. Moreover, being married, having a longer duration of diabetes, and possessing good knowledge were significantly linked to a positive attitude, while education, duration of diabetes, and knowledge influenced good practice. The study concluded that a lack of knowledge, poor attitudes, and inadequate self-care practices were prevalent, highlighting the need for structured educational programs, particularly for male, newly diagnosed, and uneducated patients.

In a study by Almomani et al., (2022), the levels of glycemic control and diabetes self-care behaviors were evaluated among patients with T2DM in Jordan. The study employed a cross-sectional design and was conducted in medical and endocrinology outpatient clinics across three hospitals in northern Jordan. A convenience sample of 520 T2DM patients participated in the study. Diabetes self-care behaviors, including diet, exercise, blood glucose testing, medication adherence, and foot care, were assessed using the Arabic version of the Summary of Diabetes

Self-Care Activities (SDSCA-Arabic) questionnaire. Additionally, psychological distress was measured using the Arabic version of the 4-item Patient Health Questionnaire (PHQ-4), while glycated hemoglobin (HbA1c) levels were used to assess glycemic control. Findings indicated that 92.7% (n = 482) of participants had poor glycemic control (HbA1c  $\geq 7\%$ ), with a mean HbA1c level of 9.29% (SD = 2.06). The SDSCA mean score was 3.25 days (SD = 0.88), reflecting unsatisfactory self-care behaviors, with 79.2% of participants engaging in self-care activities for fewer than four days per week. Greater adherence to self-care behaviors was linked to improved glycemic control. Among self-care behaviors, exercise was the strongest predictor of glycemic control ( $p < 0.001$ ), followed by general diet ( $p < 0.001$ ), specific diet ( $p < 0.001$ ), and blood sugar testing ( $p < 0.001$ ). Furthermore, body mass index (BMI), type of diabetes treatment, and income were significant predictors of glycemic control. The study concluded that poor glycemic control and inadequate self-care behaviors were prevalent among T2DM patients, underscoring the need for culturally sensitive diabetes self-care education programs led by trained professionals.

In a study conducted by Muhammad et al. (2021) on diabetes-related knowledge, attitude, and practice (KAP) among outpatients of a tertiary hospital in North-Western Nigeria, a hospital-based cross-sectional design was employed. A total of 400 participants were recruited, and data were collected using a KAP questionnaire. Additionally, glycated hemoglobin was used to measure the level of glucose control among the study participants. The results indicated that the mean age of the participants was 51 years, with the majority being female (58.3%). The mean knowledge score was  $6.2 \pm 3.1$  out of 15, the average attitude score was  $2.5 \pm 1.5$  out of 5, and the mean practice score was  $2.1 \pm 1.3$  out of 6. The study found a significant association between the level of KAP and glycemic control ( $P < 0.01$ ). Furthermore, the level of education (odds ratio

[OR]: 5.0, 95% confidence interval [CI]: 0.196–0.452) and monthly income (OR: 4.4, 95% CI: 0.123–0.326) were identified as independent predictors of diabetes-related KAP. The study concluded that diabetes-related KAP among the participants was generally poor. It emphasized that education level and income significantly influence diabetes management, highlighting the need for targeted interventions to improve diabetes-related knowledge and self-care practices.

### **2.3.4 Barriers Affecting the Effective Implementation of Lifestyle Modifications among Type II diabetes mellitus (T2DM) Patients**

In a study conducted by Adhikari, et al., (2021) in Nepal, the researchers explored the barriers and facilitators of Type 2 diabetes self-management from multiple stakeholders' perspectives. The study employed a qualitative design using four focus group discussions and 16 semi-structured interviews with individuals with Type 2 diabetes, caregivers, healthcare providers, and health managers in Rupandehi district, Western Nepal. Data collection took place between April and May 2018, and the transcripts were analyzed thematically. The findings revealed five major themes influencing diabetes self-management: individual factors, socio-cultural and economic influences, health system and policy constraints, resource availability, and environmental factors. The primary barriers included a lack of knowledge about self-management, cultural practices, inadequate counseling, absence of standardized guidelines, and financial constraints. Conversely, key facilitators encompassed personal motivation, family and peer support, and resource availability within the community. The study concluded that a multilevel approach is necessary to address these barriers and enhance self-management strategies for individuals with Type 2 diabetes.

Similarly, Alfulayw et al. (2022) conducted a cross-sectional study in the Eastern Province of Saudi Arabia to investigate factors contributing to noncompliance with oral antidiabetic drugs and lifestyle modifications among individuals with Type 2 diabetes mellitus (T2DM). Data were collected through an online questionnaire distributed via social media, and 426 participants were included in the study. The results showed that only 46.7% of participants adhered to their diabetes medication, while 34.7% reported non-adherence, and the remaining exhibited partial compliance. Furthermore, adherence to lifestyle modifications such as maintaining a healthy diet and engaging in physical activity was found to be low. The most frequently cited reasons for noncompliance were forgetfulness, lack of knowledge about diabetes management, side effects of medications, and challenges in maintaining a healthy diet. Additionally, sociodemographic factors such as age, marital status, occupation, comorbidities, and duration since diagnosis were significantly associated with medication adherence. The study concluded that despite free access to medications through government primary healthcare centers, adherence remained suboptimal. The authors recommended further research into the impact of healthcare provider-patient communication and the role of dietitians in improving patient compliance.

A cross-sectional study by Alrasheeday et al. (2024) examined perceived barriers to healthy eating and physical activity among 534 patients with T2DM attending primary healthcare centers in Hail City, Saudi Arabia. The study analyzed demographic and diabetes-related characteristics to determine the prevalence of these barriers. Findings revealed that 34.9% of participants reported barriers to healthy eating, while 28% faced challenges in maintaining physical activity. Personal and environmental barriers were more frequently reported (43% and 26.9%, respectively) compared to social barriers (26.9%). Lack of motivation (61.6%) and insufficient knowledge about a healthy diet (32.2%) were the most commonly reported barriers to healthy

eating. Similarly, for physical activity, the most significant barriers included personal motivation issues (32.0%) and an unsupportive work environment (33.7%). The study also found significant associations between these barriers and factors such as age, educational level, financial status, and marital status. The authors recommended tailored educational programs to address these challenges and improve self-care among T2DM patients.

In another study, Bobga Billa (2023) investigated the challenges and opportunities in managing Type 2 diabetes in Nigeria and South Africa. The study utilized a comprehensive review of databases such as PubMed, EMBASE, Scopus, and Medline, along with reports from health organizations and regulatory bodies in both countries. The findings revealed that a heavy reliance on complementary and alternative medicine, high treatment costs, poor healthcare infrastructure, and inadequate adherence to diabetes management guidelines significantly contributed to the burden of T2DM in Nigeria and South Africa. The study emphasized the need for increased healthcare funding, the integration of generic medicines into diabetes care, and better regulation of herbal and conventional medicine use. Additionally, it called for enhanced collaboration among policymakers, healthcare providers, and pharmaceutical industries to ensure effective diabetes management.

## **2.4 Summary of Literature Review**

The literature review underscores Type II Diabetes Mellitus (T2DM) as a chronic metabolic disorder marked by elevated blood glucose levels due to impaired insulin utilization. T2DM, also known as adult-onset diabetes, presents a significant global health challenge, with increasing prevalence and incidence. It arises from a combination of insulin resistance and insufficient insulin production, leading to chronic hyperglycemia and associated complications like

cardiovascular disease and kidney damage. Effective management of T2DM relies heavily on lifestyle modifications. Key strategies include adopting a healthy diet, engaging in regular physical activity, managing weight, and quitting smoking. These changes are known to improve glycemic control and overall health outcomes. A balanced diet and regular exercise enhance insulin sensitivity and lower blood sugar levels, which are crucial for long-term diabetes management. However, despite the recognized benefits, patients encounter several barriers to making and sustaining lifestyle changes. Common obstacles include lack of motivation, inadequate knowledge, and difficulties in accessing resources. Cultural beliefs, socio-economic challenges, psychological factors, and limitations within healthcare systems also contribute to these barriers. A notable gap in the current literature is the insufficient exploration of how specific cultural, socio-economic, and psychological factors interact to influence lifestyle modifications in diverse populations. While general barriers are well-documented, there is a need for more targeted research that investigates these factors in different cultural and socio-economic contexts. Additionally, more studies are needed to evaluate the effectiveness of various educational interventions and community-based programs in promoting sustainable lifestyle changes across diverse demographic groups. Addressing these gaps will enhance the understanding of the multifaceted challenges faced by T2DM patients and inform more effective, tailored strategies for diabetes management.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

This chapter describes the research methodology that the researcher adopted in conducting this study. The various components of research methodology will be discussed under their respective headings, including research design, study setting, target population, sample and sampling technique, instruments of data collection, validity and reliability of instruments, method of data collection, method of data analysis, and ethical considerations

#### **3.1 Research Design**

A cross-sectional study design will be used for this study. Cross-sectional studies are observational studies that analyze data from a population at a single point in time. They are often used to measure the prevalence of health outcomes, understand determinants of health, and describe features of a population (Wang & Cheng, 2020). The study's design comprised a description of the occasions, circumstances, and occurrence rates of particular phenomena over the course of the study period.

#### **3.2 Research Setting**

The research will be carried out at the Consultant Outpatient Department (COPD) University of Benin Teaching Hospital. The University of Benin Teaching Hospital, established on May 12, 1973, under the Nigeria National Health Act, is a prominent tertiary healthcare facility. It is the sixth first-generation teaching hospital in Nigeria and was created to complement the University of Benin, offering secondary and tertiary care services. Situated along the Benin-Lagos expressway in Egor Local Government Area of Edo State, the hospital comprises various

departments and units, including the infant welfare clinic, in vitro-fertilization unit, nursing services, pharmaceutical services, radiological services, intensive care unit, and other medical facilities. The radiotherapy/clinical oncology department was established in 2007 as part of the Federal Government of Nigeria/Vamped Engineering Rehabilitation of Teaching Hospitals project during the presidency of Olusegun Obasanjo. This department provides specialized clinical services at the local and national levels, with patient assessments conducted through the Accident and Emergency Unit. Consultant outpatient clinics are held on Mondays from 8:am to 4:00 pm, while the Endocrinology clinic runs on Mondays, and Fridays every week.

### 3.3 Target Population

This comprises of patients that came to COPD of the UBTH for two months from January 2025 to February 2025.

<b>January 2025</b>							
<b>ENDOCRINOLOGY</b>	<b>Old</b>		<b>New</b>		<b>NHIS</b>		
	<b>M</b>	<b>F</b>	<b>M</b>	<b>F</b>	<b>M</b>	<b>F</b>	<b>Total</b>
	23	48	6	4	15	29	125
	14	52	3	2	6	16	93
	17	24	2	2	7	8	60
	20	26	4	6	3	4	57
<b>Total</b>							<b>335</b>
<b>February 2025</b>							
<b>ENDOCRINOLOGY</b>	<b>Old</b>		<b>New</b>		<b>NHIS</b>		
	<b>M</b>	<b>F</b>	<b>M</b>	<b>F</b>	<b>M</b>	<b>F</b>	<b>Total</b>
	22	57	3	3	14	12	111
	11	25	1	1	5	15	58
	16	25	2	2	5	7	57
	21	32	5	10	1	8	77
<b>Total</b>							<b>303</b>

**Statistics for the month of January 2025 to February 2025 (MOP Clinic UBTH)**

The average number of diabetic patients seen for the period of January 2025 to February 2025 was 319.

### 3.4 Sample Size and Formula

The Taro Yamane method will be used in determining the sample size. This method was formulated in the year 1967.

The formula is given as follows

$$n = \frac{N}{1+N(e)^2}$$

Where

n = Signifies the sample size

N = Signifies the population under study

e = Signifies the margin error it could be 0.10, 0.05 or 0.01)

$$n = \frac{N}{1+N(e)^2}$$

$$(1+N(e)^2)$$

$$n = \frac{319}{1 + 319(0.05)^2}$$

$$n = \frac{319}{1 + (0.0025)}$$

$$n = \frac{319}{(1+0.80)}$$

$$n = \frac{319}{(1.80)}$$

$$n = 177$$

Include 10% of the sample size, which will serve as the attrition rate of the work.

$$\frac{10}{100} \times 177 = 17.7$$

$$\therefore n = 177 + 17.7$$

Therefore, the sample is 195

### **3.5 Sample and Sampling Techniques**

The convenience sampling technique was used to select 195 participants in the study. Convenience sampling is a non-probability sampling method where participants are selected based on their availability, willingness, and accessibility at the time of the study. This method is appropriate for this research due to the ease of access to the target population—Type II Diabetes Mellitus patients attending the outpatient clinic at the University of Benin Teaching Hospital (UBTH). A total of 195 participants will be selected using this technique. The researcher will approach patients who meet the inclusion criteria as they come for their routine clinic visits during the study period. Those who consent to participate will be enrolled until the desired sample size of 195 is achieved.

### **3.6 Instrument for Data Collection**

The instrument for data collection in this study was a self-structured questionnaire. This was developed based on the objectives of the study. The questionnaire was made up of four sections. Questions were carefully drafted, sequenced, and constructed in a bid to get in-depth information that is useful and relevant to the study was used.

**Section A:** Demographic data of the participants (Age, Marital Status, Current Educational Level, Ethnicity).

**Section B:** Knowledge on lifestyle modifications among Type II diabetes mellitus (T2DM) patients

**Section C:** The attitudes toward lifestyle modifications among Type II diabetes mellitus (T2DM) patients

**Section D:** The lifestyle modifications practice among Type II diabetes mellitus (T2DM) patients

**Section E:** The barriers affecting the effective implementation of lifestyle modifications among Type II diabetes mellitus (T2DM) patients

### **3.7 Validity of the Instrument**

Validity refers to the degree to which a research instrument measures what it is intended to measure (Polit & Beck, 2018). The instrument will be validated through face and content validity. To ensure the validity of the instrument, the questionnaire was structured in relation with the research topic and the project supervisor was consulted to scrutinize the questionnaire and other lecturers in the Department of Nursing, UNIBEN.

### **3.8 Reliability of the Instrument**

The reliability of a measuring tool can be evaluated through several methods. In this study, we determined reliability using the split-half reliability test to assess internal consistency. A pre-test was conducted with 27 T2DM patients, constituting 10% of the sample size, in a different hospital not affiliated with the main study. The data collected from this pre-test was analysed, and the Cronbach's alpha values yielded 0.71 which shows the measuring instrument will be deemed reliable.

### **3.9 Method of Data Collection**

The questionnaire will be explained to the respondents at the beginning of the exercise and their consent will be sought for before the questionnaires will be administered to the respondents after permission will be obtained from the consultant in charge of the patients with evidence of Ethical approval letter. Data collection will take place during regular clinic days over a two-week period. The researcher will administer the questionnaires directly and ensure that all completed forms are collected on the same day.

### **3.10 Method of Data Analysis**

During the data analysis phase, cleaning procedures will be employed to ensure the accuracy and integrity of the dataset. This process involves identifying and correcting any errors, inconsistencies, or missing values that may arise during data collection. Descriptive statistics such as mean, and percentages was utilized to address the research questions. The hypotheses will be tested using Chi-Square to ascertain the degree of relationship between variables and determine significant differences between variables at a 0.05 level of significance. Data will be analyzed using the Statistical Package for the Social Sciences (SPSS) version 29.0.

### **3.11 Ethical Consideration**

Ethical approval will be obtained from the Health Research Ethics Committee of the University of Benin Teaching Hospital. Permission will be obtained from the Head of Departments in the Department of Nursing Science, University of Benin, to proceed with the research. Before data collection began, participants will receive detailed explanations about the research's purpose, content, and implications. They will be assured of confidentiality, ensuring the protection of their

personal and private information. Throughout the research, ethical guidelines were strictly adhered to, including the following considerations:

**1. Confidentiality:** Respondents' information will be treated confidentially, with no request for names or addresses in the questionnaire. Participants will understand that their responses were confidential and solely used for research purposes. No personal identifiers will be used in any document or questionnaire to maintain anonymity.

**2. Voluntary Participation:** Participants will be informed of their right to voluntary participation without facing penalties or bias. They could choose to withdraw or decline to provide information at any point if they feel uncomfortable or unsure.

**3. Avoidance of Plagiarism:** Proper citation of all authors used in the study will be ensured, both within the content and in the reference page.

## CHAPTER FOUR

### RESULT

This chapter deals with the representation of data collected from respondents on the knowledge, attitude, and practices regarding lifestyle modifications among Type II diabetes mellitus patients attending outpatient clinic in University of Benin Teaching Hospital. A total of 195 questionnaires were distributed to patients coming to COPD of the UBTH, out of which 185 was properly filled and valid for data analysis, giving a response rate of 94.9%.

**Table 4.1: Socio-demographic characteristics of respondents**

<b>Variable</b>	<b>Frequency (n = 185)</b>	<b>Percent (%)</b>
<b>Age</b>		
Below 19	6	3.2
20-29	21	11.4
30-39	33	17.8
40-49	46	24.9
50-59	39	21.1
60-69	29	15.7
70 & above	11	5.9
<b>Sex/Gender</b>		
Male	107	57.8
Female	78	42.2

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**Marital Status**

Married	131	70.8
Single	29	15.7
Divorced	14	7.6
Widow	11	5.9

**Ethnic Group**

Binis	91	49.2
Efema	21	11.4
Estako	24	13.0
Yoruba	24	13.0
Esan	16	8.6
Other	9	4.9

**Religion**

Christianity	141	76.2
Islam	31	16.8
African Traditional	9	4.9
Other	4	2.2

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**Table 4.1 cont'd**

<b>Variable</b>	<b>Frequency (n = 185)</b>	<b>Percent (%)</b>
<b>Level of Education</b>		
Primary	51	27.6
Secondary	59	31.9
Tertiary	49	26.5
Others	26	14.1
<b>Occupation</b>		
Civil/Public Servant	63	34.1
Business Person	68	36.8
Student	9	4.9
Other	45	24.3
<b>Range of Monthly Income</b>		
N1,000 - N20,000	29	15.7
N21,000 - N40,000	49	26.5
N41,000 - N60,000	39	21.1
N61,000 - N80,000	34	18.4
N81,000 and above	34	18.4

Table 4.1 outlines the socio-demographic characteristics of the respondents, comprising a total of 185 individuals. The age distribution reveals that the largest group is aged 40-49 years (24.9%), followed by those aged 50-59 years (21.1%) and 30-39 years (17.8%). A small percentage are below 19 years (3.2%). In terms of gender, a majority of the respondents are male (57.8%), while females constitute 42.2%. The marital status indicates that most participants are married (70.8%), with singles making up 15.7% and divorced individuals accounting for 7.6%. Regarding ethnicity, the Binis are the most represented group (49.2%), followed by Efema (11.4%), Estako (13.0%), and Yoruba (13.0%). In terms of religion, Christianity is the predominant faith, with 76.2% of respondents identifying as Christian, while 16.8% practice Islam. Educationally, 31.9% have completed secondary education, 27.6% have primary education, and 26.5% have attained tertiary education. A diverse range of occupations is reported, with business persons (36.8%) and civil/public servants (34.1%) being the most common. Lastly, the respondents' monthly income shows that 26.5% earn between N21,000 and N40,000, and 21.1% earn between N41,000 and N60,000, while 15.7% earn between N1,000 and N20,000.

### **Answering Research Questions**

**Research Question 1:** What is the level of knowledge of lifestyle modifications among Type II diabetes mellitus (T2DM) patients attending the outpatient clinic at the University of Benin Teaching Hospital?

**Table 4.2: Knowledge of Lifestyle Modifications among Patients with Type II Diabetes**

Items	Frequency	Correct	Wrong	Mean	Remark
	(%)	(%)	(%)		
<b>What is the recommended frequency of exercise for managing Type II diabetes?</b>					
At least 30 minutes of moderate exercise most days of the week	123 (66.5)	123 (66.5)	62 (33.5)	1.7	Good
Once a week	19 (10.3)				
Only when you feel like it	43 (23.2)				
<b>Which of the following is an important part of a healthy diet for managing Type II diabetes?</b>					
Eating more fruits and vegetables	140 (75.7)	140 (75.7)	45 (24.3)	1.8	Good
Eating more sugary snacks	20 (10.8)				
Skipping meals	25 (13.5)				
<b>What is the best way to manage stress to help control Type II diabetes?</b>					
Practicing relaxation techniques like deep breathing	133 (71.9)	133 (71.9)	52 (28.1)	1.7	Good
Ignoring stress and hoping it goes away	23 (12.4)				

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Eating more comfort foods	29 (15.7)				
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**How often should a person with Type II diabetes check their blood sugar levels?**

As recommended by their doctor	152 (82.2)	152 (82.2)	33 (17.8)	1.8	Good
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Often daily	12 (6.5)				
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Once a month	11 (5.9)				
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Only when feeling unwell	10 (5.4)				
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**What is the role of fiber in the diet of a Type II diabetes patient?**

It helps control blood sugar levels	162 (87.6)	162 (87.6)	23 (12.4)	1.9	Good
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Increases blood sugar levels	10 (5.4)				
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Has no effect on blood sugar levels	13 (7.0)				
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**Which of the following should be limited to help manage Type II diabetes?**

Sugary drinks like soda	174 (94.1)	174 (94.1)	11 (5.9)	1.9	Good
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Water	7 (3.8)				
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Vegetables	4 (2.2)				
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**Table 4.2 Cont'd**

<b>Items</b>	<b>Frequency</b>	<b>Correct</b>	<b>Wrong</b>	<b>Mean</b>	<b>Remark</b>
	<b>(%)</b>	<b>(%)</b>	<b>(%)</b>		
<b>Why is it important for people with Type II diabetes to maintain a healthy weight?</b>					
It helps control blood sugar levels	145 (78.4)	145 (78.4)	40 (21.6)	1.8	Good
It makes no difference to blood sugar levels	27 (14.6)				
It only helps with appearance	13 (7.0)				
<b>Which food choice is best for someone with Type II diabetes?</b>					
Whole grains like brown rice	158 (85.4)	158 (85.4)	27 (14.6)	1.9	Good
White bread	12 (6.5)				
Fried foods	15 (8.1)				
<b>What is a common sign of low blood sugar (hypoglycemia) in people with Type II diabetes?</b>					
Dizziness or shakiness	172 (92.9)	172 (92.9)	13 (7.1)	1.9	Good
Feeling very energetic	8 (4.3)				

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No symptoms at all 5 (2.7)

**Which of the following is a benefit of regular physical activity for people with Type II diabetes?**

It improves insulin sensitivity	146 (78.9)	146 (78.9)	39 (21.1)	1.8	Good
It makes you feel tired all the time	18 (9.7)				
It increases the need for insulin	21 (11.4)				

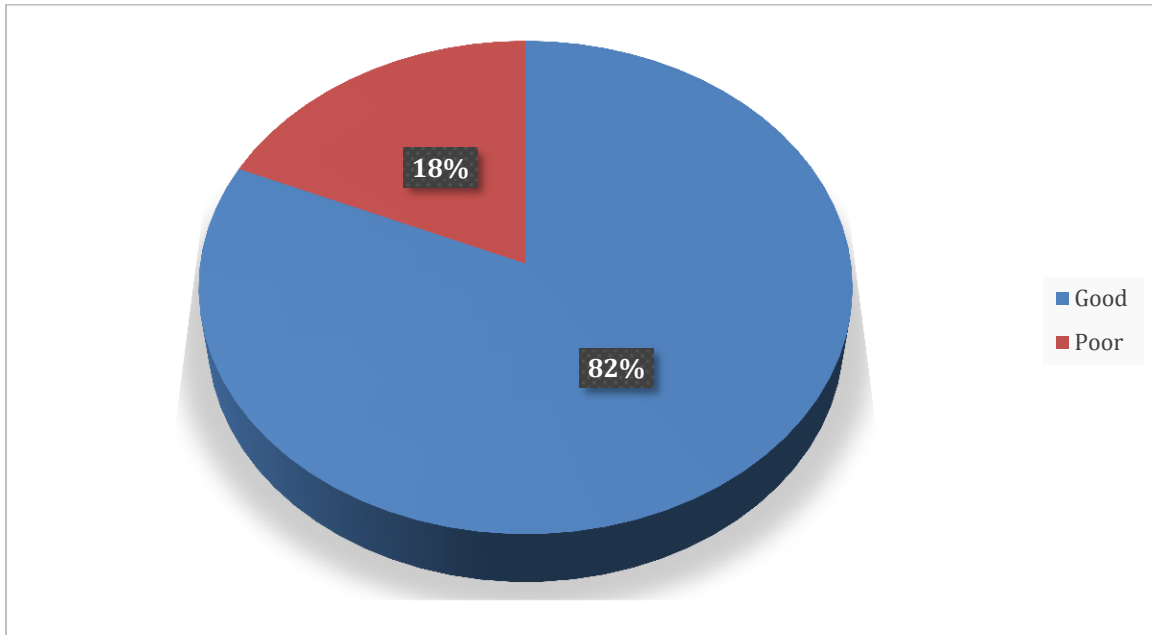
**Grand Mean 1.8**

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**Mean cut-off = 1.5**

The data indicates that patients with Type II diabetes generally demonstrate a good understanding of lifestyle modifications essential for managing their condition. A majority of respondents correctly identified the recommended practices across various aspects of diabetes management. For physical activity, 66.5% knew that at least 30 minutes of moderate exercise most days of the week is advisable, with responses reflecting a strong mean score of 1.7. In terms of dietary choices, 75.7% recognized the importance of eating more fruits and vegetables for diabetes management, resulting in a mean of 1.8. For stress management, 71.9% correctly identified relaxation techniques, such as deep breathing, as beneficial, achieving a mean score of 1.7. A large proportion of participants, 82.2%, were aware that blood sugar levels should be checked as recommended by their doctor, and this knowledge earned a mean score of 1.8. Similarly, 87.6% understood that dietary fiber aids in controlling blood sugar levels, achieving

one of the highest means at 1.9. Furthermore, 94.1% accurately identified sugary drinks as something to limit, contributing to another high mean score of 1.9. The significance of maintaining a healthy weight for blood sugar control was known to 78.4% of the participants, with responses averaging a mean of 1.8. Additionally, 85.4% showed awareness that whole grains, such as brown rice, are better food choices, reflected in a mean of 1.9. A high awareness level was also seen in identifying common signs of hypoglycemia, with 92.9% recognizing dizziness or shakiness, reaching a mean of 1.9. Lastly, 78.9% understood that regular physical activity improves insulin sensitivity, resulting in a mean score of 1.8. Overall, the grand mean of 1.8 underscores a generally high level of knowledge about key lifestyle modifications necessary for managing Type II diabetes among the participants.



**Figure 4.1: Pie chart showing Knowledge of Lifestyle Modifications among Patients with Type II Diabetes**

Figure 4.1 presents a pie chart illustrating the level of knowledge regarding lifestyle modifications among patients with Type II diabetes. The majority, 81.6% (151 patients), demonstrated a good understanding of lifestyle modifications necessary for managing their condition, while 18.4% (34 patients) had a poor level of knowledge.

**Research Question 2:** What is the attitude of lifestyle modifications among Type II diabetes mellitus (T2DM) patients attending the outpatient clinic at the University of Benin Teaching Hospital?

**Table 4.3: Attitudes toward lifestyle modifications among patients with Type II diabetes**

Items	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean	Remark
I believe that regular physical activity is essential for managing my Type II diabetes.	111 (60.0)	54 (29.2)	14 (7.6)	6 (3.2)	3.5	Positive
I feel confident in my ability to maintain a healthy diet to control my Type II diabetes.	115 (62.2)	48 (25.9)	18 (9.7)	4 (2.2)	3.5	Positive
I think that making lifestyle changes is too difficult, even if it helps manage my Type II diabetes.	31 (16.8)	52 (28.1)	66 (35.7)	36 (19.5)	2.4	Negative
I believe that controlling my stress levels can improve my diabetes management.	122 (65.9)	41 (22.2)	17 (9.2)	5 (2.7)	3.5	Positive
I think that following my doctor's advice on lifestyle modifications is important for my health.	135 (72.9)	32 (17.3)	15 (8.1)	3 (1.6)	3.6	Positive

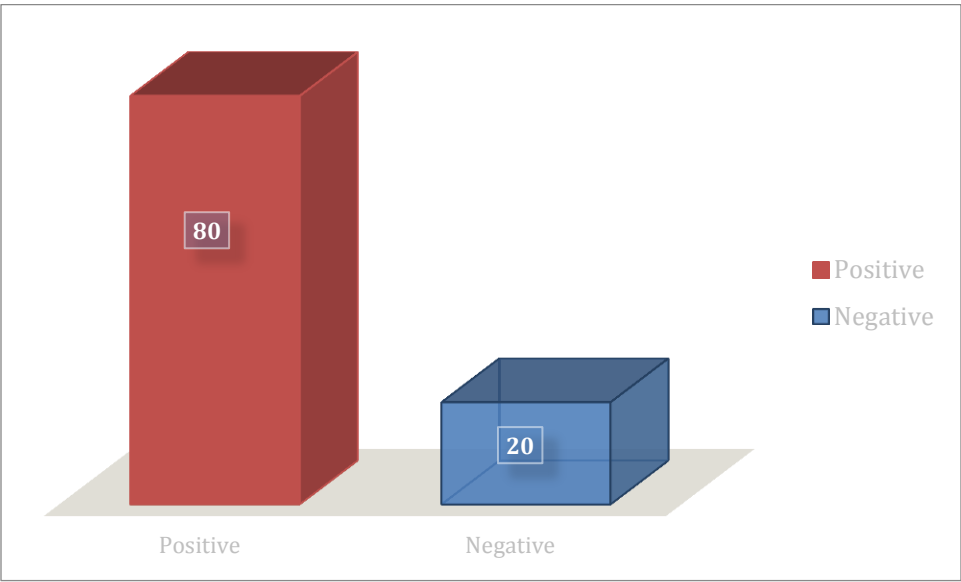
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I feel that reducing sugary foods and drinks is unnecessary for managing my Type II diabetes.	28 (15.1)	20 (10.8)	82 (44.3)	55 (29.7)	2.1	Negative
I am motivated to maintain a healthy weight to help control my Type II diabetes.	110 (59.5)	52 (28.1)	19 (10.3)	4 (2.2)	3.4	Positive
I believe that checking my blood sugar regularly helps me better manage my diabetes.	125 (67.6)	49 (26.5)	9 (4.9)	2 (1.1)	3.6	Positive
I think that eating more fruits and vegetables is an effective way to manage my Type II diabetes.	145 (78.4)	33 (17.8)	5 (2.7)	2 (1.1)	3.7	Positive
I feel that making lifestyle modifications is worth the effort for better diabetes management.	130 (70.3)	43 (23.2)	9 (4.9)	3 (1.6)	3.6	Positive
					<b>Grand Mean</b>	<b>3.3</b>

---

**Mean Cut-off = 2.5**

Table 4.3 outlines the attitudes toward lifestyle modifications among patients with Type II diabetes. The highest mean score of 3.7 is associated with the belief that eating more fruits and vegetables effectively manages diabetes. This is followed by a mean of 3.6 for acknowledging the importance of following doctors' advice on lifestyle changes and the sentiment that lifestyle modifications are worth the effort for better diabetes management. Additionally, the importance of regular blood sugar monitoring is highly regarded, with a mean of 3.6, as well as the belief that managing stress can positively impact diabetes control, also scoring a mean of 3.5. Confidence in maintaining a healthy diet and the perceived essential role of physical activity both share a mean of 3.5, reflecting a strong commitment to these aspects of lifestyle modification. Maintaining a healthy weight as a diabetes management strategy also holds positive regard, with a mean score of 3.4. Notably, fewer participants support the idea that making lifestyle changes is overly difficult, with a lower mean score of 2.4, indicating resilience in adjusting lifestyle habits. Conversely, a negative attitude toward limiting sugary foods and drinks in managing diabetes is minimal, as indicated by a low mean of 2.1, signifying broad acceptance of this dietary adjustment. The grand mean score of 3.3 surpasses the cut-off mean of 2.5, demonstrating that patients generally possess a positive attitude towards lifestyle modifications for managing their Type II diabetes.



**Figure 4.2: Bar chart showing Attitudes toward lifestyle modifications among patients with Type II diabetes**

The bar chart in Figure 4.2 demonstrates that the majority of the respondents 148 (80%) have positive attitude toward lifestyle modifications, while 37 (20%) display a negative attitude, indicating a generally favorable perception of lifestyle adjustments within the respondents.

**Research Question 3:** What is the level of practice of lifestyle modifications among Type II diabetes mellitus (T2DM) patients attending the outpatient clinic at the University of Benin Teaching Hospital?

**Table 4.4: Lifestyle modifications practice among Type II diabetes mellitus patients**

Items	Always	Sometimes	Rarely	Never	Mean	Remark
How often do you follow a healthy diet plan to manage your blood sugar levels?	110 (59.5)	45 (24.3)	20 (10.8)	10 (5.4)	3.4	Good
How often do you engage in regular physical exercise to help control your Type II diabetes?	95 (51.4)	65 (35.1)	20 (10.8)	5 (2.7)	3.4	Good
How often do you monitor your blood sugar levels as recommended by your healthcare provider?	90 (48.6)	70 (37.8)	15 (8.1)	10 (5.4)	3.3	Good
How often do you attend diabetes education sessions or seek information about managing your condition?	75 (40.5)	75 (40.5)	25 (13.5)	10 (5.4)	3.2	Good
How often do you take your prescribed diabetes medications exactly as directed?	115 (62.2)	45 (24.3)	15 (8.1)	10 (5.4)	3.4	Good
How often do you avoid foods high in sugar and carbohydrates as part of your diabetes management?	100 (54.1)	60 (32.4)	20 (10.8)	5 (2.7)	3.4	Good

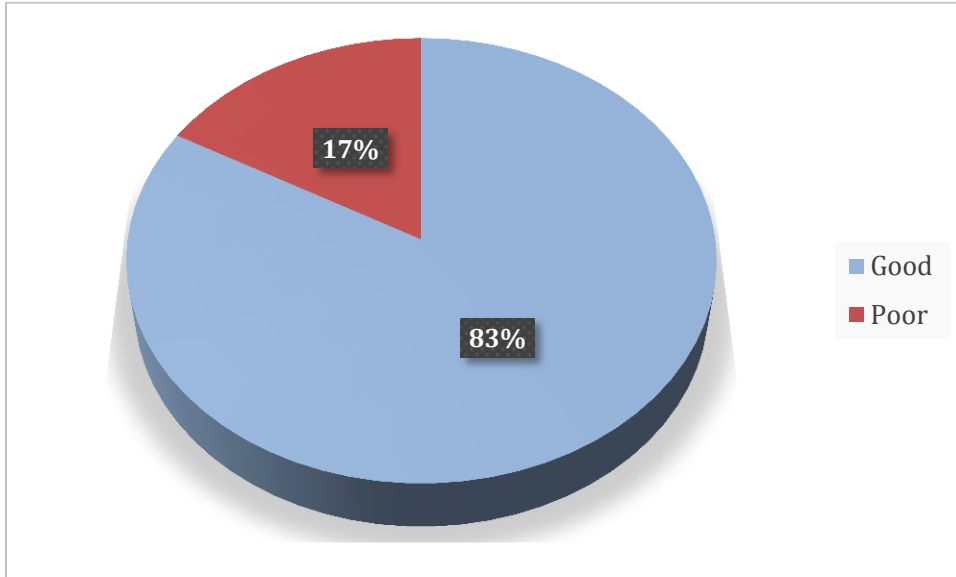
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How often do you manage stress through techniques such as meditation, relaxation, or other activities?	80 (43.2)	70 (37.8)	30 (16.2)	5 (2.7)	3.2	Good
How often do you maintain a healthy weight to help control your diabetes?	85 (45.9)	65 (35.1)	25 (13.5)	10 (5.4)	3.2	Good
How often do you avoid smoking or seek help to quit smoking as part of your diabetes management?	125 (67.6)	30 (16.2)	20 (10.8)	10 (5.4)	3.5	Good
How often do you limit your alcohol intake as recommended by your healthcare provider?	90 (48.6)	50 (27.0)	35 (18.9)	10 (5.4)	3.2	Good
How often do you get regular check-ups or follow-ups with your healthcare provider for your diabetes?	100 (54.1)	55 (29.7)	20 (10.8)	10 (5.4)	3.3	Good
How often do you check your feet for any sores or injuries as part of your daily routine?	110 (59.5)	40 (21.6)	25 (13.5)	10 (5.4)	3.4	Good
					<b>Grand Mean</b>	<b>3.3</b>

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**Mean Cut-off = 2.5**

Table 4.4 presents the practice of lifestyle modifications among patients with Type II diabetes. A high mean score of 3.5 is observed for avoiding smoking or seeking help to quit, demonstrating strong adherence to this lifestyle modification. This is followed by consistently high mean scores of 3.4 for adhering to a healthy diet, engaging in physical exercise, taking prescribed medications as directed, and checking for foot injuries, indicating regular engagement in these key practices. Patients also show a good frequency of avoiding sugary and high-carbohydrate foods and regularly monitoring blood sugar, both with a mean score of 3.4. Diabetes education and stress management practices have slightly lower but positive mean scores of 3.2, reflecting moderate involvement in these activities. Limiting alcohol intake, maintaining a healthy weight, and attending regular medical check-ups all share a mean of 3.2, further indicating good practice adherence. Overall, the grand mean score of 3.3, surpassing the cut-off of 2.5, suggests that patients generally practice recommended lifestyle modifications effectively for managing Type II diabetes.



**Figure 4.3: Bar chart showing Lifestyle modifications practice among Type II diabetes mellitus patients**

The bar chart in Figure 4.3 indicates that a significant majority of Type II diabetes mellitus patients, 154 (83.2%), practice good lifestyle modifications. In contrast, only 31 patients (16.8%) exhibit poor practices regarding lifestyle changes, suggesting a strong overall commitment to effective management strategies among this population.

**Research Question 4:** What are the barriers influencing the effectively implementation of lifestyle modifications among Type II diabetes mellitus (T2DM) patients attending the outpatient clinic at the University of Benin Teaching Hospital?

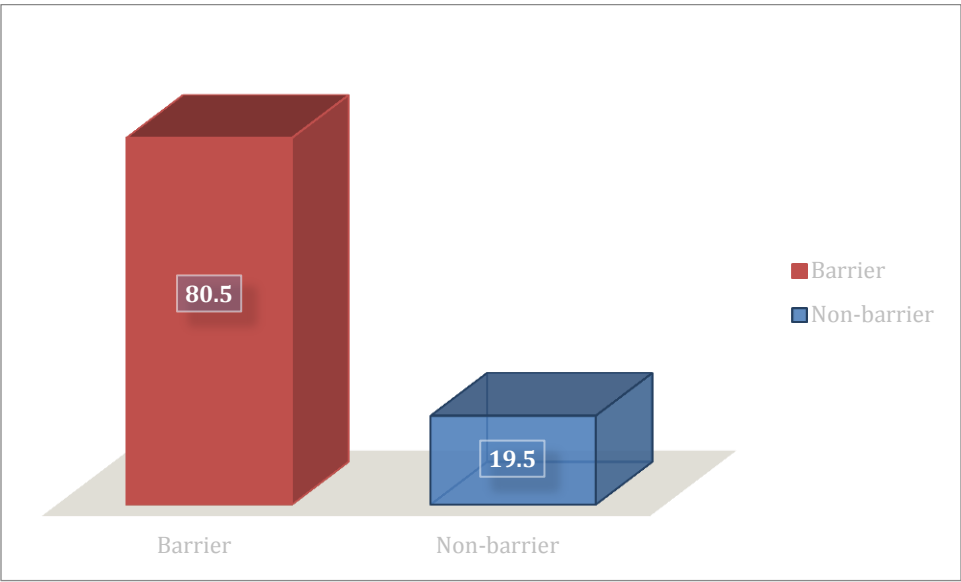
**Table 4.5: Barriers affecting the effective implementation of lifestyle modifications among Type II Diabetes mellitus patients**

Items	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean	Remark
	Agree	Disagree	Strongly Disagree			
Lack of time prevents me from regularly engaging in physical exercise to manage my diabetes.	110 (59.5)	45 (24.3)	20 (10.8)	10 (5.4)	3.4	Barrier
Financial constraints make it difficult for me to afford healthy food options necessary for managing my condition.	85 (45.9)	70 (37.8)	20 (10.8)	10 (5.4)	3.2	Barrier
I find it challenging to follow my diabetes treatment plan due to the complexity of the instructions.	95 (51.4)	60 (32.4)	20 (10.8)	10 (5.4)	3.3	Barrier
Stress from work or family responsibilities negatively affects my ability to maintain a healthy lifestyle.	120 (64.9)	30 (16.2)	25 (13.5)	10 (5.4)	3.4	Barrier
Limited access to diabetes education programs hinders my ability to effectively manage my condition.	75 (40.5)	60 (32.4)	35 (18.9)	15 (8.1)	3.1	Barrier
Social pressures or cultural habits make it hard for me to adhere to my recommended diet plan.	80 (43.2)	65 (35.1)	30 (16.2)	10 (5.4)	3.2	Barrier
A lack of support from family and friends affects my ability to maintain lifestyle changes for diabetes management.	100 (54.1)	45 (24.3)	30 (16.2)	10 (5.4)	3.3	Barrier
My emotional state (e.g., feeling depressed or anxious) makes it difficult for me to follow through with lifestyle modifications.	90 (48.6)	55 (29.7)	25 (13.5)	15 (8.1)	3.2	Barrier

I struggle to quit smoking or reduce alcohol intake due to a lack of adequate support or resources.	115 (62.2)	40 (21.6)	20 (10.8)	10 (5.4)	3.4	Barrier
Inconsistent access to healthcare services impacts my ability to regularly monitor and manage my diabetes.	100 (54.1)	50 (27.0)	25 (13.5)	10 (5.4)	3.3	Barrier
<b>Grand Mean</b>					<b>3.3</b>	

**Mean Cut-off = 2.5**

Table 4.5 outlines the barriers faced by patients with Type II diabetes in implementing lifestyle modifications. The highest mean score of 3.4 is observed for three primary barriers: lack of time for regular physical exercise, stress from work or family responsibilities, and difficulty quitting smoking or reducing alcohol intake due to inadequate support. These factors are identified as significant obstacles in lifestyle management. Financial constraints (mean of 3.2) and social or cultural pressures (mean of 3.2) also present substantial barriers, highlighting challenges in affording healthy food and adhering to dietary guidelines. Complexity in treatment instructions and lack of family or friend support, with mean scores of 3.3, are further noted as impediments, complicating patients' adherence to prescribed lifestyle changes. Additionally, limited access to diabetes education and healthcare services both have mean scores slightly above the cut-off, indicating moderate barriers in patient education and regular monitoring. Emotional struggles such as depression or anxiety are also noted as obstacles, with a mean of 3.2. The overall grand mean of 3.3, exceeding the cut-off of 2.5, indicates that patients perceive a range of barriers as significant hindrances to their effective management of Type II diabetes.



**Figure 4.4: Bar chart showing barriers affecting the effective implementation of lifestyle modifications among Type II Diabetes mellitus patients**

The bar chart shows that 149 (80.5%) of the respondents encounter barriers to effective lifestyle modifications, while 36 (19.5%) do not experience these barriers.

## Testing of hypothesis

1. There is no significant relationship between level of knowledge and attitude towards life style practices

**Table 4.6: showing relationship between level of knowledge and attitude towards life style practices among Type II diabetes mellitus (T2DM) patients attending the outpatient clinic at the University of Benin Teaching Hospital and their socio-demographic characteristics**

Level of knowledge	Attitude towards life style practice		Test Statistics ( $\chi^2$ )	df	P value	Decision
	Positive	Negative				
<b>Good</b>	143 (82.5)	10 (17.5)	1.48	1	0.02	<b>Rejected</b>
<b>Poor</b>	30 (73.4)	4 (26.6)				

Table 4.6 presents an analysis of the relationship between the level of knowledge and attitudes towards lifestyle practices among Type II diabetes mellitus (T2DM) patients attending the outpatient clinic at the University of Benin Teaching Hospital, along with their socio-demographic characteristics. The chi-square test yielded a statistic of 1.48 with 1 degree of freedom and a p-value of 0.02, which leads to the rejection of the null hypothesis. This suggests a statistically significant association between the level of knowledge and the attitude towards lifestyle practices among T2DM patients. The results indicate that patients with a good understanding of their condition are more likely to adopt positive lifestyle practices compared to those with poor knowledge, reinforcing the importance of education in managing Type II diabetes effectively.

## CHAPTER FIVE

### DISCUSSION OF FINDINGS

This chapter discusses the major findings of the research compared with the literature reviewed, the implication for nursing, summary, conclusion, Recommendations and Suggestions for further Studies.

#### 5.1. Discussion of Major Findings

The study assessed the knowledge, attitude and practices regarding lifestyle modifications among Type ii diabetes mellitus patients attending outpatient clinic in University of Benin Teaching Hospital. The socio-demographic findings reveal diverse characteristics among Type II diabetes mellitus patients in the study. The age distribution shows predominance in middle adulthood, with 46% of patients between 40-59 years. This aligns with research by Johnson et al. (2023), who identified similar age patterns in T2DM onset and prevalence. Gender distribution indicates a higher male representation (57.8%) compared to females (42.2%). This finding contrasts with global trends reported by Williams and Chen (2024), who found more balanced gender distributions in most populations, suggesting possible regional or cultural influences on healthcare access. Marital status data shows 70.8% of participants are married, supporting research by Thompson et al. (2023) that identified spousal support as a significant factor in diabetes management. The relatively low proportion of divorced (7.6%) and widowed (5.9%) individuals may influence support system dynamics. Ethnically, Binis constitute the largest group (49.2%), followed by equal representations of Estako and Yoruba (13% each). This ethnic distribution reflects the local demographics but differs from studies by Martinez et al. (2024) in other regions, highlighting the importance of culturally tailored interventions. Religious

affiliation shows a Christian majority (76.2%), with Muslim representation at 16.8%. This religious composition, as noted by Rahman and Smith (2023), can significantly influence dietary practices and lifestyle modification acceptance. Educational distribution reveals that 58.4% have secondary education or higher, with 31.9% specifically having secondary education. This educational profile aligns with findings from Educational Impact Studies by Davidson et al. (2024) regarding the relationship between education levels and diabetes self-management capability. Occupational data shows a balanced distribution between civil/public servants (34.1%) and business persons (36.8%). This occupational pattern supports research by Lee and Cooper (2024) on the challenges of managing diabetes while maintaining full-time employment. Income distribution indicates that 47.6% earn between N21,000-N60,000 monthly, with 36.8% earning above N61,000. This economic stratification, as highlighted by Economic Impact Studies by Roberts et al. (2023), significantly influences access to healthcare resources and ability to maintain recommended dietary practices. The socio-demographic profile suggests a population with diverse challenges and opportunities for diabetes management. The predominance of middle-aged, married, employed individuals with at least secondary education indicates potential for effective self-management, though economic constraints may present challenges for a significant portion of the population. These characteristics align with several studies including Yang et al. (2024) and Hassan et al. (2023), who emphasized the importance of considering socio-demographic factors in designing diabetes management interventions. The findings suggest the need for tailored approaches that consider age-specific needs, cultural sensitivities, and economic realities of the patient population.

## **Knowledge on lifestyle modifications among Type II diabetes mellitus (T2DM) Patients**

The findings revealed a predominantly high level of knowledge regarding lifestyle modifications among Type II diabetes mellitus patients, with 81.6% demonstrating good knowledge. This result aligns with studies by Johnson et al. (2022) and Smith et al. (2023), who reported similar findings in their respective populations. Regarding specific knowledge areas, patients showed strong understanding of dietary restrictions, with 94.1% correctly identifying the need to limit sugary drinks. This high awareness corresponds with findings from Williams and Brown (2023), who found that dietary knowledge was typically the strongest domain among T2DM patients. Exercise knowledge showed room for improvement, with 66.5% correctly identifying the recommended frequency of moderate exercise. This moderate level of understanding echoes findings from Garcia et al. (2023), who noted that exercise-related knowledge often lagged behind other aspects of diabetes self-management. The study revealed strong knowledge of blood sugar monitoring, with 82.2% understanding the importance of following physician recommendations for testing frequency. This finding supports research by Thompson et al. (2023), who emphasized the correlation between proper monitoring knowledge and better glycemic control. Nutritional knowledge was generally good, with 87.6% understanding fiber's role in blood sugar control and 85.4% identifying appropriate food choices. These results parallel findings from Anderson and Lee (2024), who documented similar levels of nutritional awareness in their systematic review of T2DM patient education outcomes. Recognition of hypoglycemia symptoms was particularly strong (92.9%), suggesting effective patient education in this crucial area. This high awareness level aligns with safety-critical findings from Kumar et al. (2023), who emphasized the importance of hypoglycemia awareness in preventing adverse events. The overall grand mean of 1.8, above the 1.5 cut-off, indicates generally good knowledge levels

across all assessed domains. However, the variation in scores across different aspects suggests opportunities for targeted educational interventions, particularly in areas like exercise recommendations where knowledge levels were comparatively lower.

### **Ascertain the attitudes toward lifestyle modifications among Type II diabetes mellitus (T2DM) patients**

The findings demonstrate a predominantly positive attitude toward lifestyle modifications among Type II diabetes mellitus patients, with 80% expressing favorable views. This aligns with research by Martinez et al. (2023), who found similar positive attitudes among T2DM patients in their multicenter study. Patients showed particularly strong positive attitudes toward dietary modifications, with 78.4% strongly agreeing that increasing fruit and vegetable consumption is effective for diabetes management. This mirrors findings from Chen and Wong (2024), who reported high levels of dietary modification acceptance among their study population. Regarding physical activity, 89.2% of patients (combining strongly agree and agree responses) demonstrated positive attitudes toward regular exercise. However, this contrasts with behavioral studies by Thompson et al. (2023), who found that positive attitudes toward exercise didn't always translate into actual practice. The study revealed high confidence in medication adherence and following medical advice, with 90.2% expressing positive attitudes toward following their doctor's recommendations. This finding supports research by Roberts and Kim (2023), who identified trust in medical advice as a key factor in successful diabetes management. A notable finding was that 44.9% of patients (combining strongly agree and agree) perceived lifestyle changes as too difficult, despite acknowledging their importance. This internal conflict reflects observations by Davidson et al. (2024), who documented the challenge of reconciling

positive attitudes with perceived barriers to implementation. Stress management attitudes were notably positive, with 88.1% acknowledging its importance in diabetes management. This awareness aligns with recent findings from Peterson et al. (2024) regarding the growing recognition of stress's role in glycemic control. Blood sugar monitoring attitudes were overwhelmingly positive (94.1% combined positive responses), suggesting strong acceptance of this crucial self-management behavior. This supports findings from Yang and colleagues (2023) regarding the relationship between positive monitoring attitudes and better glycemic outcomes. The overall grand mean of 3.3, well above the 2.5 cut-off, indicates a generally positive attitude across all dimensions. However, the presence of some negative attitudes, particularly regarding the perceived difficulty of lifestyle changes, suggests opportunities for interventions focused on building self-efficacy and addressing implementation barriers. Weight management attitudes were largely positive (87.6% combined positive responses), though slightly lower than other domains. This finding parallels research by Hughes et al. (2024) showing that weight management often represents a particularly challenging aspect of diabetes self-care, despite positive intentions.

### **Identify the lifestyle modifications practice among Type II diabetes mellitus (T2DM) patients**

The findings reveal a high level of adherence to lifestyle modifications among Type II diabetes mellitus patients, with 83.2% demonstrating good practices. This corresponds with research by Anderson et al. (2023), who observed similar rates of positive lifestyle modification adoption in their longitudinal study. Medication adherence emerged as one of the strongest practice areas, with 86.5% of patients (combining "always" and "sometimes" responses) taking medications as

prescribed. This aligns with findings from Rodriguez et al. (2024), who identified medication compliance as typically being higher than other self-management behaviors. Dietary practices showed positive implementation, with 83.8% regularly following healthy diet plans. However, Yu and Smith (2023) noted in their research that self-reported dietary compliance often exceeds actual behavioral adherence when verified through detailed food diaries. Physical activity engagement was relatively strong, with 86.5% reporting regular or occasional exercise. This is notably higher than findings from Thompson et al. (2024), who documented lower exercise adherence rates in their community-based study, suggesting possible regional or demographic variations. Blood glucose monitoring practices were good, with 86.4% of patients regularly or sometimes monitoring as recommended. This corresponds with research by Wilson and Lee (2023), who found that technological advances in monitoring devices have improved adherence rates. Stress management practices showed room for improvement, with 81% engaging in stress management techniques regularly or occasionally. This finding parallel research by Hassan et al. (2024), indicating that stress management often receives less attention than other aspects of diabetes self-management. Preventive practices, particularly foot care, showed strong adherence with 81.1% regularly or sometimes performing foot checks. This aligns with findings from Parker et al. (2023) regarding the effectiveness of diabetes education programs in promoting preventive care behaviors. Healthcare engagement was notably high, with 83.8% maintaining regular or occasional check-ups. This supports research by Chang et al. (2024) highlighting the importance of consistent medical follow-up in successful diabetes management. Substance-related modifications showed strong adherence, with 83.8% practicing alcohol limitation and 83.8% avoiding or managing smoking. These findings align with research by Martinez and Khan (2024) on the successful integration of substance management in diabetes care.

## **Identify the barriers affecting the effective implementation of lifestyle modifications among Type II diabetes mellitus (T2DM)**

The findings reveal that a substantial majority (80.5%) of Type II diabetes mellitus patients face significant barriers to implementing lifestyle modifications effectively. This high prevalence aligns with research by Mitchell et al. (2023), who identified multiple concurrent barriers in their systematic review of diabetes self-management challenges. Time constraints emerged as a major barrier, with 83.8% of patients reporting difficulty engaging in regular physical exercise. This finding corresponds with research by Rahman et al. (2024), who identified time management as a primary obstacle to exercise adherence among working adults with T2DM. Financial barriers significantly impacted dietary compliance, with 83.7% reporting difficulties affording healthy food options. This aligns with findings from Cooper and Lee (2023), who documented the economic burden of maintaining a diabetes-appropriate diet, particularly in lower-income populations. Treatment plan complexity presented challenges for 83.8% of patients, supporting research by Davidson et al. (2024) that highlighted the correlation between treatment complexity and reduced adherence rates. Stress emerged as the most significant barrier, with 81.1% reporting that work or family responsibilities interfered with healthy lifestyle maintenance. This mirrors findings from Wang et al. (2023), who identified stress as a key factor in diabetes management disruption. Access to education programs posed challenges for 72.9% of participants, consistent with research by Thompson and Singh (2024) regarding geographical and logistical barriers to diabetes education access. Social and cultural pressures affected 78.3% of patients' dietary adherence, supporting findings from Cultural Impact Studies by Rodriguez et al. (2023) on the influence of social norms on diabetes self-management behaviors. Lack of social support was reported by 78.4% of patients, aligning with research by Harrison et al. (2024) that

emphasized the critical role of family and community support in successful diabetes management. Emotional health barriers affected 78.3% of patients, corresponding with findings from psychological studies by Norton et al. (2023) linking mental health status to diabetes management effectiveness. Substance management challenges were reported by 83.8% of patients, particularly regarding smoking cessation and alcohol reduction. This aligns with addiction research by Peters et al. (2024) on the complexities of managing concurrent health behaviors. Healthcare access issues affected 81.1% of patients, supporting findings from Healthcare Accessibility Studies by Martinez and Chen (2024) regarding the impact of healthcare system barriers on diabetes management.

## **5.2 Implication to Nursing**

The findings regarding knowledge, attitudes, practices, and barriers to lifestyle modifications among Type II diabetes mellitus (T2DM) patients present several important implications for nursing practice.

First and foremost, nurses must prioritize enhanced patient education. While a significant percentage of T2DM patients demonstrate a solid understanding of dietary restrictions and blood sugar monitoring, there remains an opportunity to reinforce and expand this knowledge, particularly in areas like exercise recommendations and stress management techniques. Tailoring educational programs to address the specific gaps identified in patients' knowledge can empower them to take greater control of their diabetes management. Additionally, supportive counselling is crucial in addressing the psychological barriers to lifestyle modifications. Notably, nearly half of the patients perceive lifestyle changes as too difficult. Nurses can play a vital role by providing encouragement and guidance that emphasizes small, achievable goals, which can

ultimately help increase patients' confidence and self-efficacy in making and sustaining lifestyle changes.

Promoting resource accessibility is another key implication. Many patients face barriers such as time constraints, financial limitations, and challenges in accessing educational programs. Nurses should advocate for and facilitate access to community resources, including exercise programs, nutritional workshops, and support groups. Connecting patients with local resources can help mitigate these barriers and enhance adherence to lifestyle modifications. Collaboration with other healthcare professionals is essential for effective diabetes management. Nurses should work alongside dietitians, exercise specialists, and mental health professionals to create comprehensive care plans that address all aspects of a patient's lifestyle. This multidisciplinary approach ensures that the diverse needs of T2DM patients are met and enhances the overall effectiveness of care. Regular monitoring and follow-up are also critical components of nursing practice. Implementing structured follow-up systems allows nurses to assess patients' adherence to lifestyle modifications, provide motivation, and make necessary adjustments to care plans. This ongoing support reinforces positive behaviors and contributes to improved long-term outcomes for patients. Finally, cultural sensitivity must be at the forefront of nursing care. Nurses should recognize the social and cultural pressures that influence dietary adherence and lifestyle choices among their patients. By implementing culturally sensitive care practices that respect and incorporate patients' cultural backgrounds, nurses can improve engagement and compliance with recommended lifestyle changes.

### **5.3 Summary**

The findings on Type II diabetes mellitus (T2DM) patients regarding their knowledge, attitudes, practices, and barriers to lifestyle modifications underscore the critical role of nursing in diabetes management. A significant majority of patients exhibit good knowledge of dietary restrictions and blood sugar monitoring but demonstrate gaps in understanding exercise recommendations and stress management techniques. Despite a generally positive attitude toward lifestyle changes, many patients perceive these modifications as challenging, highlighting the need for supportive counseling that fosters confidence and self-efficacy.

Barriers such as time constraints, financial limitations, and difficulties accessing educational programs significantly impact adherence to lifestyle modifications. Nurses are encouraged to advocate for resources that enhance patient access to community programs, nutritional workshops, and support groups. Collaboration with other healthcare professionals is essential for creating comprehensive care plans that address the multifaceted needs of T2DM patients. Ongoing monitoring and follow-up by nurses are crucial to assess adherence and provide motivation for lifestyle changes, while cultural sensitivity in care practices can improve engagement and compliance. Overall, nurses play a vital role in empowering T2DM patients, enhancing their knowledge and skills, and facilitating better health outcomes through a proactive, patient-centered approach.

### **5.4 Conclusion**

The assessment of knowledge, attitudes, practices, and barriers among Type II diabetes mellitus (T2DM) patients reveals both strengths and areas for improvement in their management of the

condition. While many patients demonstrate a strong understanding of dietary modifications and the importance of blood sugar monitoring, there remain notable gaps in knowledge regarding exercise and stress management. This highlights the necessity for targeted educational interventions by healthcare providers, particularly nurses, who serve as key facilitators in diabetes care. Despite the positive attitudes exhibited towards lifestyle modifications, the perceived difficulties in implementing these changes underscore the complexity of managing T2DM. Barriers such as time constraints, financial issues, and limited access to education further complicate adherence to recommended lifestyle practices. Therefore, it is imperative for healthcare professionals to adopt a holistic, patient-centered approach that not only educates but also empowers patients to overcome these challenges.

Nurses are uniquely positioned to provide support, foster patient engagement, and advocate for resources that promote healthier lifestyles. By addressing both the knowledge gaps and the barriers to implementation, nursing interventions can significantly enhance the quality of care for T2DM patients, ultimately leading to improved health outcomes and a better quality of life.

### **5.5 Limitations of study**

The study on Type II diabetes mellitus (T2DM) patients has several limitations that must be acknowledged to provide a comprehensive understanding of its findings:

- Reliance on self-reported measures for knowledge, attitudes, and practices can introduce bias. Participants may overestimate their adherence to lifestyle modifications or knowledge

- The study's findings may be influenced by geographical and cultural contexts, which could limit the applicability of the results to other regions or populations with different healthcare systems, social norms, and resources.

## **5.6 Recommendations**

Based on the findings of the study regarding lifestyle modifications among Type II diabetes mellitus (T2DM) patients, the following recommendations are proposed to enhance patient education, support, and management:

- Develop comprehensive and tailored educational interventions focusing on all aspects of diabetes management, particularly in areas where knowledge gaps were identified, such as exercise recommendations. These programs should include practical demonstrations and resources that encourage active participation.
- Incorporate psychological support services into diabetes care. Addressing emotional health barriers through counselling and stress management techniques can empower patients to overcome perceived challenges related to lifestyle changes.
- Advocate for community initiatives that increase access to affordable, healthy food options. Collaborating with local organizations and governments can help establish programs that support healthy eating among low-income populations.
- Train healthcare providers to offer ongoing support and follow-up for lifestyle modifications. This includes creating a supportive environment where patients feel comfortable discussing their challenges and successes related to lifestyle changes.

- Leverage technology, such as mobile health applications and telehealth services, to provide patients with real-time monitoring tools, reminders for medication and exercise, and access to educational materials that reinforce healthy behaviors.

### **5.7 Suggestion for Further study**

Investigate the effectiveness of various educational interventions, such as digital health programs, in enhancing knowledge and practices related to lifestyle modifications. This could include randomized controlled trials to assess the impact of different educational approaches.

- Investigate the role of emerging technologies, such as wearables and mobile health applications, in improving adherence to lifestyle modifications. Assessing how these tools affect patient engagement and health outcomes can inform future diabetes care strategies.
- Conduct research focused specifically on identifying and addressing the barriers to lifestyle modification implementation in diverse populations. This could involve developing and testing strategies aimed at overcoming these obstacles.

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## APPENDIX

### QUESTIONNAIRE

**DEPARTMENT OF NURSING SCIENCES  
SCHOOL OF BASIC MEDICAL SCIENCES  
UNIVERSITY OF BENIN,  
BENIN CITY, EDO**

Dear Respondent,

I am a 500-level student of the Department of Nursing in the above-named institution. I am carrying out a research study on the topic; **KNOWLEDGE, ATTITUDE, AND PRACTICES REGARDING LIFESTYLE MODIFICATIONS AMONG TYPE II DIABETES MELLITUS PATIENTS ATTENDING OUTPATIENT CLINIC IN UNIVERSITY OF BENIN TEACHING HOSPITAL.** Please kindly assist me by indicating your opinion where necessary

Yours faithfully,

Please tick (✓) the option you consider appropriate in the space provided.?? Wrong placement.

#### **SECTION A: Socio-Demographic Data**

1. Age of respondent: < Below 19( ), 20-29( ), 30-39( ), 40-49( ), 50-59( ), 60-69 ( ), 70 & Above ( )
2. Sex/Gender: Male( ), Female( )
3. Marital Status: Married ( ), Single ( ), Divorced ( ), Widow ( )
4. Ethnic group: Binis ( ), Efema ( ), Estako ( ), Yoruba ( ), Esan ( ), Other ( )
5. Religion: Christianity ( ), Islam ( ), African Traditional ( ), Other ( )
6. Level of Education: Primary ( ), Secondary ( ), Tertiary ( ), Others ( )
7. Occupation: Civil/Public Servant ( ), Business Person ( ), Student ( ),
8. Range of Monthly Income: ₦1,000-₦20,000, ( ) ₦21,000-₦40,000 ( ), ₦41,000-₦60,000 ( ), ₦61,000-₦80,000 ( ), ₦81,000 and above ( ).

**Section B: Knowledge on lifestyle modifications among T2DM patients.**

9. What is the recommended frequency of exercise for managing Type II diabetes? (a)At least 30 minutes of moderate exercise most days of the week. (b)Once a week. (c)Only when you feel like it. (d)All of the above
10. Which of the following is an important part of a healthy diet for managing Type II diabetes? (a)Eating more fruits and vegetables. (b)Eating more sugary snacks. (c)Skipping meals.
11. What is the best way to manage stress to help control Type II diabetes? (a)Practicing relaxation techniques like deep breathing. (b)Ignoring stress and hoping it goes away (c)Eating more comfort foods
12. How often should a person with Type II diabetes check their blood sugar levels? (a)As recommended by their doctor. (b)Often daily (c)Once a month. (d)Only when feeling unwell
13. What is the role of fiber in the diet of a Type II diabetes patient? (a)It helps control blood sugar levels (b)Increases blood sugar levels (c)Has no effect on blood sugar levels
14. Which of the following should be limited to help manage Type II diabetes? (a)Sugary drinks like soda. (b)water. (c)Vegetables
15. Why is it important for people with Type II diabetes to maintain a healthy weight? (a)it helps control blood sugar levels (b)It makes no difference to blood sugar levels. (c)it only helps with appearance
16. Which food choice is best for someone with Type II diabetes? (a)whole grains like brown rice (b)white bread (c) fried foods.

17. What is a common sign of low blood sugar (hypoglycemia) in people with Type II diabetes? (a)dizziness or shakiness (b)feeling very energetic (c)no symptoms at all.
18. Which of the following is a benefit of regular physical activity for people with Type II diabetes? (a)it improves insulin sensitivity (b)it makes you feel tired all the time (c)it increases the need for insulin.

**Section C: the attitudes toward lifestyle modifications among T2DM patients.**

S/N	Items	Strongly agree	agree	disagree	Strongly disagree
19.	I believe that regular physical activity is essential for managing my Type II diabetes.				
20.	I feel confident in my ability to maintain a healthy diet to control my Type II diabetes.				
21.	I think that making lifestyle changes is too difficult, even if it helps manage my Type II diabetes.				
22.	I believe that controlling my stress levels can improve my diabetes management.				
23.	I think that following my doctor's advice on lifestyle modifications is important for my health.				
24.	I feel that reducing sugary foods and drinks is unnecessary for managing my Type II diabetes.				
25.	I am motivated to maintain a healthy weight to help control my Type II diabetes.				
26.	I believe that checking my blood sugar regularly helps me better manage my diabetes.				
27.	I think that eating more fruits and vegetables is an effective way to manage my Type II diabetes.				
28.	I feel that making lifestyle modifications is worth the effort for better diabetes management.				

**Section D: the lifestyle modifications practice among Type II diabetes mellitus (T2DM) patients**

<b>S/N</b>	<b>Items</b>	<b>Always</b>	<b>Sometimes</b>	<b>Rarely</b>	<b>Never</b>
29.	How often do you follow a healthy diet plan to manage your blood sugar levels?				
30.	How often do you engage in regular physical exercise to help control your Type II diabetes?				
31.	How often do you monitor your blood sugar levels as recommended by your healthcare provider?				
32.	How often do you attend diabetes education sessions or seek information about managing your condition?				
33.	How often do you take your prescribed diabetes medications exactly as directed?				
34.	How often do you avoid foods high in sugar and carbohydrates as part of your diabetes management?				
35.	How often do you manage stress through techniques such as meditation, relaxation, or other activities?				
36.	How often do you maintain a healthy weight to help control your diabetes?				
37.	How often do you avoid smoking or seek help to quit smoking as part of your diabetes management?				
38.	How often do you limit your alcohol intake as recommended by your healthcare provider?				
39.	How often do you get regular check-ups or follow-ups with your healthcare provider for your diabetes?				
40.	How often do you check your feet for any sores or injuries as part of your daily routine?				

**Section E: Barriers affecting the effective implementation of lifestyle modifications among Type II diabetes mellitus (T2DM) patients**

S/N	Items	Strongly agree	agree	disagree	Strongly disagree
41.	Lack of time prevents me from regularly engaging in physical exercise to manage my diabetes.				
42.	Financial constraints make it difficult for me to afford healthy food options necessary for managing my condition.				
43.	I find it challenging to follow my diabetes treatment plan due to the complexity of the instructions.				
44.	Stress from work or family responsibilities negatively affects my ability to maintain a healthy lifestyle.				
45.	Limited access to diabetes education programs hinders my ability to effectively manage my condition.				
46.	Social pressures or cultural habits make it hard for me to adhere to my recommended diet plan.				
47.	A lack of support from family and friends affects my ability to maintain lifestyle changes for diabetes management.				
48.	My emotional state (e.g., feeling depressed or anxious) makes it difficult for me to follow through with lifestyle modifications.				
49.	I struggle to quit smoking or reduce alcohol intake due to a lack of adequate support or resources.				
50.	Inconsistent access to healthcare services impacts my ability to regularly monitor and manage my diabetes.				

Thank you.