ASSESSMENT OF COMPLIANCE TO DIET-THERAPY AMONG PATIENTS WITH DIABETES MELLITUS TYPE 1 IN TERTIARY HEALTH INSTITUTION

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BENIN CITY

OCTOBER, 2025

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IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF

BACHELOR OF NURSING SCIENCE (BNSc)

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BENIN CITY

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DECLARATION

This is to declare that this research project titled "**ASSESSMENT OF COMPLIANCE TO DIET-THERAPY AMONG PATIENTS WITH DIABETES MELLITUS TYPE 1 IN TERTIARY HEALTH INSTITUTION**" was carried out by **CHIGBO ROSEMARY ONYINYE**. It is solely the result of my work except where acknowledged as being derived from other person(s) or resources.

MATRICULATION NUMBER: _____

FACULTY OF NURSING SCIENCE,

UNIVERSITY OF BENIN, BENIN CITY, EDO STATE.

Signature: _____

Date:_____

CERTIFICATION

This is to certify that this project titled "**ASSESSMENT OF COMPLIANCE TO DIET-THERAPY AMONG PATIENTS WITH DIABETES MELLITUS TYPE 1 IN TERTIARY HEALTH INSTITUTION**" was carried out by **CHIGBO ROSEMARY ONYINYE** with matriculation number **BMS1906321**, Faculty of Nursing Sciences, University of Benin, Benin City under the supervision of **MRS. N.E OYANA.**

MRS N.E. OYANA _____ **Sign & Date**
Project Supervisor

PROF. (MRS.) C.E. OMOROGBE _____ **Sign & Date**
Head of Department (Med-Surg)

(External Examiner) _____ **Sign & Date**

DEDICATION

This project work is dedicated to the **ALMIGHTY GOD** who has been my constant source of help and strength in my academic journey.

To my beloved Parents, Mr. and Mrs. Alexander and Anthonia Chigbo, whose unwavering support both financially and morally has kept me outstanding and fostering success all through my academic year.

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I love and appreciate y'all.

ABSTRACT

Type 1 diabetes mellitus (T1DM) is a chronic condition requiring strict adherence to diet therapy for effective management and prevention of complications. This study aimed to assess the level of compliance to diet therapy among patients with T1DM attending a tertiary health institution. A descriptive cross-sectional survey design was adopted. Using a convenience sampling technique, 195 patients attending the Chest Out-Patient Department (COPD) of the University of Benin Teaching Hospital (UBTH) between February and March 2025 were selected. A structured questionnaire was used for data collection, and 187 properly completed questionnaires were retrieved, yielding a response rate of 95.9%. Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 26.0, and findings were presented in frequencies, percentages, and means. The majority of respondents (55.1%) were aged between 32 and 37 years, with a slight female predominance (54.5%). Most participants were of Edo ethnicity (52.4%), had attained tertiary education (42.2%), and were predominantly traders (38.5%). The assessment of knowledge regarding diet therapy revealed a generally good level of awareness, with a grand mean score of 3.1 (cut-off = 2.5). Respondents demonstrated strong knowledge in areas such as the importance of meal timing, portion control, reducing sugar intake, and awareness of healthy food choices for blood sugar management. The findings indicate that patients with type 1 diabetes mellitus in this tertiary health institution possess a good level of knowledge regarding diet therapy. However, gaps remain in areas such as practical application and consistent adherence to dietary recommendations. It is recommended that continuous diabetes education programs emphasizing practical dietary management strategies be strengthened. Healthcare providers should offer personalized dietary counseling and regular follow-up to enhance patient compliance and ultimately improve health outcomes among individuals living with type 1 diabetes mellitus.

Keywords: assessment, compliance, diet-therapy, patients, diabetes mellitus, type 1

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Type 1 diabetes mellitus (T1DM) is an autoimmune condition primarily diagnosed in children and young adults (Pasi & Ravi, 2022). It is characterized by the destruction of insulin-producing beta cells in the pancreas, leading to a lifelong dependency on exogenous insulin for the regulation of blood glucose levels (Eizirik et al., 2020). Over the past few decades, the incidence of T1DM has been rising at an alarming rate, particularly among children and adolescents (Urakami, 2020). Type 1 diabetes mellitus remains the predominant form of diabetes in children and adolescents worldwide. According to recent global data, the prevalence of Type 1 diabetes mellitus varies significantly across regions and ethnic groups (Perng et al., 2023). For example, in the United States, non-Hispanic White youth exhibit higher prevalence rates of Type 1 diabetes mellitus compared to other racial and ethnic groups (Agarwal et al., 2020).

Diabetes mellitus is a chronic metabolic disorder characterized by persistently elevated blood glucose levels due to insufficient insulin production or the body's inability to utilize insulin effectively. Among its forms, Type 1 diabetes (T1D) is an autoimmune condition where the immune system attacks and destroys insulin-producing beta cells in the pancreas, resulting in lifelong insulin dependence. Effective management of T1D extends beyond insulin therapy to include strict adherence to a well-balanced diet, which plays a critical role in stabilizing blood glucose levels, preventing complications, and improving quality of life. Non-compliance with dietary recommendations can lead to severe consequences, such

as diabetic ketoacidosis, cardiovascular diseases, kidney dysfunction, and nerve damage (Ernawati & Angraini, 2024; Namazi et al., 2021).

Dietary compliance is central to diabetes management because of its direct impact on blood glucose control and overall health outcomes. Non-compliance with dietary guidelines has been linked to unstable blood glucose levels, increased cholesterol, and heightened risk of cardiovascular diseases (Datkayeva et al., 2022). Patients with T1D are often advised to follow specific dietary plans that emphasize balanced nutrition, including low-fat dairy products, an abundance of fruits and vegetables, limited sodium intake, and controlled snacking. Additionally, maintaining a regular meal schedule is critical for aligning insulin doses with food intake, thereby ensuring better glycemic control. Compliance with these dietary principles significantly enhances the management of T1D and contributes to improved patient outcomes (Builes-Montaño et al., 2022).

Several factors influence dietary adherence among T1D patients. Nutrition education is one of the most significant factors in promoting adherence. Studies have shown that patients who receive diabetes-focused nutrition education are more likely to understand and follow dietary recommendations, leading to improved glycemic control. For instance, education on carbohydrate counting and meal planning enables patients to make informed dietary choices that align with their treatment plans (Pratiwi et al., 2021; Koutnik et al., 2024).

The duration of living with T1D also plays a critical role in dietary compliance. Research indicates that patients with a longer duration of living with T1D tend to adhere better to dietary guidelines, likely due to increased familiarity with their condition and the development of effective coping strategies. Conversely, newly diagnosed patients may face

challenges due to a lack of understanding of their dietary needs and the long-term implications of non-compliance (Horikawa et al., 2020).

Social support is another key determinant of dietary adherence. Patients with strong support systems—whether from family, friends, or diabetes-focused peer groups—are more likely to adhere to dietary regimens and successfully manage their condition. Studies have shown that the presence of social support helps to motivate patients, provides emotional reinforcement, and reduces diabetes-related distress, all of which are critical in maintaining adherence (Wagustina et al., 2021). On the other hand, patients who lack social support often struggle with adherence, resulting in poorer outcomes.

Geographic location also significantly impacts dietary compliance. For patients living in rural areas, limited access to healthy foods, healthcare services, and education programs often poses a barrier to adherence (Golembiewski et al., 2022). A lack of specialized foods and insufficient healthcare infrastructure in rural regions further complicates dietary management. Additionally, rural residents may have reduced access to diabetes education programs, making it challenging for them to manage their condition effectively (Nketia et al., 2022).

Dining out presents a unique challenge for individuals with T1D. Restaurant meals often contain high levels of calories, sodium, and unhealthy fats, making it difficult to adhere to dietary recommendations (Reynolds & Mitri, 2024). Poor food choices in such settings can disrupt blood glucose control and negatively impact adherence. Educating patients on how to make healthier food choices when dining out is a vital component of comprehensive diabetes management (Tang & Lin, 2020).

Given the critical role of dietary compliance in managing T1D and the various factors influencing adherence, this study aims to assess compliance with diet therapy among patients with Type 1 diabetes mellitus in a tertiary healthcare setting.

1.2 Statement of the Problem

Dietary non-adherence remains a critical challenge in the management of Type 1 Diabetes Mellitus (T1DM), a condition requiring strict dietary compliance to achieve optimal metabolic control. Despite its significance, non-adherence rates are alarmingly high, with studies reporting figures ranging from 24% in Nigeria to as much as 55% in Ethiopia (Ernawati & Angraini, 2024; Namazi et al., 2021). This widespread non-compliance significantly hampers effective disease management, leading to poor blood glucose control, elevated cholesterol levels, and a heightened risk of severe complications such as diabetic ketoacidosis, cardiovascular disease, and kidney dysfunction (Builes-Montaño et al., 2022; Namazi et al., 2021). The problem is exacerbated by several factors, including geographic disparities, financial limitations, and cultural influences. Patients in rural areas face limited access to healthcare resources and healthy food options, which undermines their ability to follow prescribed dietary plans (Xie et al., 2020). Additionally, patients newly diagnosed with T1DM or those with a shorter duration of disease often lack the experience or education required to maintain dietary adherence (Pratiwi et al., 2021). A lack of nutrition education further compounds the issue, leaving patients ill-equipped to understand or implement dietary recommendations (Shahabi et al., 2022).

In Nigeria, the prevalence of dietary non-adherence is influenced by socioeconomic and cultural factors, such as low-income levels, limited educational opportunities, and the social dynamics surrounding communal eating and food choices (Datkayeva et al., 2022;

Xie et al., 2020). Without adequate support, including guidance from healthcare providers and encouragement from family or social networks, patients are less likely to adhere to dietary recommendations, increasing their vulnerability to diabetes-related complications (Wagustina et al., 2021; Basid & Negara, 2023). Failure to address this issue has far-reaching consequences, including increased healthcare costs, reduced quality of life, and higher mortality rates associated with uncontrolled diabetes. However, knowledge gaps remain regarding the specific barriers to dietary adherence and the effectiveness of targeted interventions, particularly in resource-limited settings like Nigeria. This study aims to explore the factors influencing dietary compliance among T1DM patients and assess strategies to enhance adherence in the Nigerian context. By identifying and addressing these barriers, the study seeks to contribute to improved management of T1DM, ultimately reducing the risk of complications and improving patient outcomes.

1.3 Objective of the Study

The broad objective of this study is to assess the compliance to diet-therapy among patients with diabetes mellitus type 1 in tertiary health institution.

The specific objectives of this study are:

1. To assess the knowledge of diet therapy among patients with type 1 diabetes mellitus in tertiary health institution
2. To determine the level of compliance with diet therapy among patients with type 1 diabetes mellitus in tertiary health institution.
3. To identify factors influencing compliance with diet therapy among patients with type 1 diabetes mellitus in tertiary health institution.

1.4 Research Questions

1. What is the knowledge of diet therapy among patients with type 1 diabetes mellitus in tertiary health institution?
2. What is the level of compliance with diet therapy among patients with type 1 diabetes mellitus in tertiary health institution?
3. What are the factors influencing compliance with diet therapy among patients with type 1 diabetes mellitus in tertiary health institution?

1.5 Research Hypothesis

1. There is no significant difference between the knowledge of diet therapy and level of compliance with diet therapy among patients with diabetes mellitus type 1 in tertiary health institution.

1.6 Significance of the Study

To the Nursing Profession

This study on dietary compliance among patients with Type 1 Diabetes Mellitus (T1DM) is of considerable significance to the nursing profession. Nurses play a pivotal role in the education, support, and monitoring of patients with chronic conditions like diabetes. Understanding the factors that influence dietary adherence enables nurses to design more effective interventions and educational programs that address specific barriers to compliance. By improving their knowledge of the determinants of dietary non-adherence, nurses can tailor their counseling and support strategies to better meet the needs of patients, promoting healthier lifestyle choices and improved disease management.

Moreover, this research can contribute to the development of evidence-based nursing practices that support the implementation of individualized care plans for patients with T1DM. Nurses can collaborate with dietitians, healthcare teams, and family members to ensure that patients receive comprehensive care that addresses not only their medical needs but also their dietary needs. Additionally, this study will help nurses understand the broader context of diabetes management, including the psychological, social, and cultural factors influencing patient behavior, which is essential for holistic care.

To Healthcare Providers

This study holds significant value for healthcare providers, including doctors, dietitians, and other allied health professionals, as it provides insights into the challenge's patients face in adhering to dietary recommendations. Healthcare providers can use the findings to improve communication with patients about the importance of dietary compliance in managing diabetes and preventing complications.

In particular, dietitians will benefit from understanding the factors that hinder adherence, allowing them to refine their dietary counseling strategies. They can tailor meal plans and nutrition advice to fit patients' cultural preferences, financial constraints, and social circumstances, which will increase the likelihood of adherence to dietary regimens. Additionally, healthcare providers can develop multidisciplinary approaches to managing T1DM that incorporate support from nurses, social workers, and psychologists, addressing the various aspects of patients' lives that influence their ability to follow prescribed diets.

For medical doctors, this research will underline the importance of routine dietary assessment in diabetic care. Integrating dietary compliance into the clinical evaluation of

diabetic patients can help identify at-risk individuals and prevent complications through early intervention. The findings will also be crucial in informing the development of national and institutional guidelines for diabetes management, emphasizing the central role of nutrition in chronic disease care.

To Type 1 Diabetes Mellitus Patients and families

This study holds significant value for patients with Type 1 Diabetes Mellitus (T1DM) and their families, offering several important benefits.

First, it promotes empowerment through knowledge by highlighting the essential role of diet therapy in managing T1DM. By equipping patients and their families with a deeper understanding of dietary choices, they can make informed decisions that support better health outcomes. Additionally, the study aims to improve quality of life by identifying and addressing barriers to dietary compliance. Better adherence to nutritional guidelines can enhance glycemic control, reducing the risk of complications and ultimately leading to improved overall well-being. Recognizing the critical role of family support, this research will provide families with the necessary knowledge to understand the dietary requirements of individuals with T1DM. A well-informed family can create a more supportive home environment, making it easier for patients to adhere to their dietary plans. Furthermore, reducing the financial burden is a crucial aspect of effective disease management. Improved dietary compliance can lead to better disease control, minimizing the need for hospitalizations and costly medical treatments, thereby easing the financial strain on patients and their families.

To the Society

The societal significance of this study is profound, as improved dietary compliance among individuals with T1DM can reduce the overall burden of diabetes-related complications in the population. By promoting better management of the condition, the study will contribute to decreasing the prevalence of diabetes-related complications, such as cardiovascular disease, kidney failure, and diabetic neuropathy, which are major health concerns globally. This, in turn, will reduce the economic burden on healthcare systems, as fewer resources will be needed to manage the long-term complications of diabetes.

Furthermore, this study highlights the importance of community-based support systems for individuals with chronic diseases like diabetes. The findings emphasize the role of social support, nutritional education, and community engagement in improving dietary compliance, which can lead to healthier lifestyles. If healthcare systems integrate these findings, it can result in better public health outcomes and a more informed society regarding the management of chronic diseases.

In a broader societal context, this research can promote the development of public health campaigns aimed at raising awareness about the critical role of diet in diabetes management. As society becomes more educated about the challenges faced by diabetic patients, there may be greater understanding and empathy, fostering a supportive environment that encourages patients to adhere to dietary guidelines and adopt healthier habits. This societal shift could ultimately lead to better health outcomes and a reduction in the overall prevalence of diabetes.

1.7 Scope of Study

The scope of this study is delimited to patients with diabetes mellitus type 1 at the University of Benin Teaching Hospital, Benin City, Nigeria. The study will focus on the compliance to diet-therapy among patients attending the Consultant Out-Patient Department (COPD) of University of Benin Teaching Hospital (UBTH). UBTH is located at Egor Local Government Area in Benin City Edo State, Nigeria.

1.8 Operational Definition of Terms

Dietary Compliance: Dietary compliance refers to the extent to which individuals with Type 1 Diabetes Mellitus (T1DM) adhere to recommended dietary guidelines and medical nutritional therapy (MNT) prescribed by healthcare providers.

Type 1 Diabetes Mellitus (T1DM): Type 1 Diabetes Mellitus is a chronic autoimmune condition in which the pancreas produces little or no insulin due to the destruction of insulin-producing beta cells in the islets of Langerhans.

CHAPTER TWO

LITERATURE REVIEW

This chapter deals with review of relevant literature under the following sub headings: Conceptual Review, Theoretical Framework, Empirical Review and summary.

2.1. Conceptual review

2.1.1 Definition and Overview of Type 1 Diabetes

Type 1 diabetes mellitus (T1DM) is a chronic autoimmune disorder that primarily affects children, adolescents, and young adults (Akil et al., 2021). It is characterized by the immune system mistakenly attacking and destroying the insulin-producing beta cells in the pancreas. Insulin is an essential hormone responsible for regulating blood glucose levels; thus, its deficiency leads to persistent hyperglycemia, which, if not properly managed, can result in severe health complications over time (Ehrmann et al., 2020). Historically, T1DM has been referred to as "juvenile diabetes" due to its high prevalence among children and adolescents, though it can occur at any age. The destruction of pancreatic beta cells in Type 1 diabetes is irreversible, necessitating lifelong management. Individuals diagnosed with T1DM require exogenous insulin administration, either through multiple daily injections or continuous subcutaneous insulin infusion (insulin pumps), to maintain optimal blood glucose levels. Proper management is critical in preventing acute complications such as diabetic ketoacidosis (DKA) (Ehrmann et al., 2020) and long-term complications including cardiovascular disease, neuropathy, nephropathy, and retinopathy (American Diabetes Association, [ADA] 2023).

Despite advancements in diabetes care and insulin therapy, managing T1DM remains challenging due to the need for constant blood glucose monitoring, dietary regulation (Datkayeva et al., 2022), and lifestyle modifications. Unlike Type 2 diabetes, which is more commonly associated with insulin resistance and lifestyle factors, Type 1 diabetes is primarily an autoimmune disorder with a strong genetic predisposition (Holman et al., 2020). While Type 2 diabetes can sometimes be managed through lifestyle changes and oral medications, T1DM requires insulin therapy from the time of diagnosis (Forst et al., 2021). The distinction between the two types highlights the unique challenges faced by individuals with T1DM, particularly in adhering to dietary therapy (Pratiwi et al., 2021) and maintaining optimal glucose control throughout different stages of life.

2.1.2 Epidemiology and Prevalence of Type 1 Diabetes

The global burden of T1DM has been increasing, with variations in incidence and prevalence across different regions. Over the past few decades, a rising trend in T1DM diagnoses among children and adolescents has been observed, which researchers attribute to a combination of genetic susceptibility, environmental factors, and improved diagnostic capabilities (Zorena et al., 2022).

A large-scale study conducted across 26 European centers by Rabbone et al. (2023) highlighted cyclical variations in T1DM incidence over a 25-year period. The study emphasized that environmental triggers such as viral infections, dietary changes (Marx et al., 2021), and climate conditions may influence the onset of the disease. Countries like Finland and Sweden report some of the highest incidence rates of T1DM globally, which

researchers have linked to both genetic predisposition and environmental triggers, including early exposure to cow's milk and vitamin D deficiency (Kaur et al., 2021).

While Type 1 Diabetes Mellitus (T1DM) has traditionally been more prevalent in developed nations, developing regions are also experiencing a steady rise in cases (Ogle et al., 2022). In Sub-Saharan Africa, countries such as Nigeria, Kenya, and South Africa have seen an increase in T1DM cases, driven by factors like rapid urbanization (Zorena et al., 2022), dietary transitions (Kaur et al., 2021), and potential environmental triggers. However, challenges such as limited healthcare infrastructure, delayed diagnosis (Ehrmann et al., 2020), and lack of access to insulin therapy significantly hinder effective disease management in these regions (Ogle et al., 2022). Ogle et al. (2022) highlighted that many low- and middle-income countries, including those in Sub-Saharan Africa, struggle with inadequate access to essential diabetes care, leading to poor health outcomes and increased mortality among individuals with T1DM.

In Europe, countries such as Romania and Bulgaria also face challenges in managing T1DM, despite having relatively better healthcare infrastructure compared to Sub-Saharan Africa. Limited awareness, disparities in healthcare access (Golembiewski et al., 2022), and regional variations in healthcare quality continue to affect the outcomes for individuals with T1DM in these countries.

Ethnic disparities in the prevalence of T1DM have also been observed. Studies suggest that individuals of European descent exhibit higher incidence rates than other ethnic groups, possibly due to genetic susceptibility (Dayan et al., 2021). However, as diagnostic awareness and reporting mechanisms improve in other populations, incidence rates among

non-European ethnic groups are increasingly being documented. Globally, countries with well-established healthcare systems tend to report higher prevalence rates of T1DM, likely due to improved early detection and comprehensive disease surveillance. Researchers stress the importance of accurate and timely data collection to better understand the global burden of T1DM and inform public health interventions. With the continued rise in T1DM cases, particularly in developing countries, there is an urgent need for international collaboration in addressing diagnostic challenges (Akil et al., 2021), improving access to insulin therapy, and enhancing disease management strategies to reduce complications and mortality rates.

2.1.3 Diet Therapy in Type 1 Diabetes Mellitus

Diet therapy is a cornerstone in the management of diabetes mellitus, particularly for patients with Type 1 Diabetes Mellitus (T1DM). It involves the strategic planning of food intake to regulate blood glucose levels, support metabolic health, and prevent complications associated with diabetes. The primary goal of diet therapy is to achieve optimal glycemic control while ensuring adequate nutrition. This is especially critical for individuals with T1DM, who rely on insulin therapy and must balance their carbohydrate intake with insulin administration to maintain stable blood glucose levels.

Recent studies emphasize the importance of personalized dietary plans that consider individual preferences, cultural practices, and lifestyle factors. For instance, Datkayeva et al. (2022) highlight the principles of diet therapy in food planning for children with T1DM, underscoring the need for tailored approaches that enhance adherence and health outcomes. Furthermore, Namazi et al. (2021) provide a roadmap for nutrition and diet therapy in diabetes, indicating that a well-structured dietary plan can significantly improve patient

management and quality of life. Compliance with diet therapy is crucial for effective diabetes management. Adherence to dietary recommendations not only helps in maintaining glycemic control but also reduces the risk of long-term complications such as cardiovascular disease, neuropathy, and retinopathy. Studies have shown that patients who consistently follow dietary guidelines experience better health outcomes and improved quality of life. For example, Pratiwi et al. (2021) found a direct relationship between patient motivation and dietary compliance among individuals with diabetes mellitus. However, achieving high levels of compliance can be challenging due to various factors, including knowledge deficits regarding dietary practices, psychological barriers, and social influences. Builes-Montaño et al. (2022) conducted a systematic review that emphasizes the efficacy of different dietary advice methods in improving compliance among T1DM patients. Understanding these factors is essential for healthcare providers to develop effective interventions that foster adherence to diet therapy.

Diet therapy in diabetes mellitus refers to the systematic approach of managing dietary intake to achieve optimal blood glucose control and overall health. It encompasses the selection of appropriate foods, meal timing, portion control, and the balance of macronutrients to meet individual metabolic needs. The primary principles of diet therapy include carbohydrate counting, understanding glycemic index, and ensuring a balanced intake of proteins and fats. According to Datkayeva et al. (2022), effective diet therapy for children with Type 1 Diabetes Mellitus (T1DM) involves individualized meal planning that considers age, activity level, and personal preferences. This personalized approach is vital for fostering adherence and improving metabolic outcomes.

Namazi et al. (2021) further emphasize that diet therapy should be evidence-based, incorporating guidelines that reflect the latest research on nutrition and diabetes management. The goal is not only to control blood glucose levels but also to promote overall well-being, prevent complications, and enhance the quality of life for individuals living with diabetes.

Role of Diet Therapy in Managing Type 1 Diabetes

In managing Type 1 Diabetes Mellitus, diet therapy plays a critical role alongside insulin therapy. Patients with T1DM must carefully balance their carbohydrate intake with insulin doses to maintain stable blood glucose levels. This requires a deep understanding of dietary choices and their impact on glycemic control. Effective diet therapy can help prevent acute complications such as hypoglycemia and hyperglycemia while also reducing the risk of long-term complications like neuropathy, retinopathy, and cardiovascular diseases.

Studies have shown that adherence to a structured diet plan can lead to significant improvements in glycemic control. For instance, a systematic review by Builes-Montaño et al. (2022) highlights the efficacy of carbohydrate counting as a method for improving dietary compliance among T1DM patients. By empowering patients with knowledge about their dietary choices, healthcare providers can facilitate better management of their condition.

2.1.4 Diet Therapy for Type 1 Diabetes Mellitus

Type 1 Diabetes Mellitus (T1DM) is an autoimmune condition characterized by the destruction of insulin-producing beta cells in the pancreas, leading to an absolute insulin

deficiency (Akil et al., 2021). As a result, patients with T1DM require lifelong insulin therapy to regulate blood glucose levels. The primary goal of diet therapy in T1DM is to achieve stable blood glucose levels by coordinating dietary intake—particularly carbohydrate consumption with insulin administration (Holt et al., 2021).

Diet therapy is a cornerstone of managing Type 1 Diabetes Mellitus (T1DM), as it directly influences blood glucose levels and overall metabolic control. Effective dietary management involves several key strategies, including carbohydrate counting, glycemic index consideration, consistent meal patterns, macronutrient balance, and integration with physical activity and advanced technologies. These approaches are tailored to individual needs to optimize glycemic control and prevent complications.

Since insulin therapy is essential for individuals with T1DM, carbohydrate intake must be carefully monitored to match insulin doses. Carbohydrate counting is a widely used method that enables patients to estimate the grams of carbohydrates in their meals and adjust their insulin accordingly (Builes-Montaño et al., 2022). This approach empowers patients to make informed decisions about their insulin dosing, reducing the risk of hyperglycemia or hypoglycemia. The use of insulin-to-carbohydrate ratios further personalizes insulin dosing, ensuring that patients can manage their blood glucose levels effectively based on their dietary intake (Holt et al., 2021).

The glycemic index (GI) of foods plays a significant role in managing blood glucose levels. Foods with a lower GI are preferred because they result in a more gradual increase in blood sugar levels, minimizing the risk of sudden spikes. High-fiber, complex carbohydrates, such as whole grains, legumes, and vegetables, are recommended over refined

carbohydrates, which can cause rapid fluctuations in blood glucose (Namazi et al., 2021). Incorporating low-GI foods into the diet helps stabilize blood sugar levels and supports long-term glycemic control (Horikawa et al., 2020). Maintaining a consistent eating schedule is critical for individuals using exogenous insulin. Skipping meals or having erratic eating patterns can lead to significant blood sugar fluctuations, particularly for those on fixed insulin regimens (Ehrmann et al., 2020). Regular meal timing helps synchronize insulin action with food intake, reducing the risk of hypoglycemia. This consistency is especially important for patients who rely on basal-bolus insulin therapy, as it ensures that insulin doses are appropriately matched to carbohydrate intake throughout the day (Forst et al., 2021).

While carbohydrates are the primary focus of diet therapy, proteins and healthy fats also play a vital role in stabilizing blood glucose levels and preventing excessive insulin requirements. A balanced intake of macronutrients helps maintain steady energy levels and supports overall metabolic health. Patients are encouraged to consume unsaturated fats, such as those found in olive oil, nuts, and fatty fish, while limiting saturated fats to reduce cardiovascular risks (Marx et al., 2021). This approach not only supports glycemic control but also promotes heart health, which is particularly important for individuals with T1DM who are at higher risk for cardiovascular complications (Holt et al., 2021).

Physical activity is an integral part of diabetes management, but it requires careful planning to avoid hypoglycemia. Exercise can lower blood sugar levels, so patients need to adjust their carbohydrate intake or insulin dosing before and after physical activity (Tang & Lin, 2020). Regular blood sugar monitoring is essential to ensure that glucose levels

remain within the target range during and after exercise. This proactive approach helps patients reap the benefits of physical activity while minimizing the risk of adverse effects (Umphonsathien et al., 2022).

Advancements in diabetes technology have revolutionized diet therapy for T1DM. Continuous glucose monitoring (CGM) systems and insulin pumps allow for more flexible eating patterns and better glycemic control. These technologies provide real-time feedback on blood glucose levels, enabling patients to make immediate adjustments to their diet or insulin doses (Klaff et al., 2020). For example, the use of CGM can help patients identify how specific foods affect their blood sugar, allowing for more personalized dietary choices (Hou et al., 2021). Additionally, newer insulin delivery methods, such as rapid-acting insulin analogs, offer greater flexibility in meal timing and composition compared to traditional fixed-dose regimens (Holt et al., 2021).

2.1.5 Knowledge of Diet Therapy among patients with Type 1 Diabetes Mellitus

Understanding dietary requirements is essential for effective management of Type 1 Diabetes Mellitus (T1DM). Patients must learn to balance their carbohydrate intake with insulin administration to maintain stable blood glucose levels. Ernawati and Angraini (2024) emphasize that knowledge of dietary requirements directly influences compliance with medical nutrition therapy among diabetes patients. This knowledge encompasses understanding macronutrient composition, portion sizes, and the timing of meals relative to insulin doses.

Katsaridis et al. (2020) further highlight that many patients exhibit low adherence to the American Diabetes Association's nutrition recommendations, indicating a significant gap

in dietary knowledge. This lack of understanding can lead to poor dietary choices, resulting in suboptimal glycemic control and increased risk of complications. Therefore, enhancing patients' knowledge about their dietary requirements is crucial for improving health outcomes in T1DM.

2.1.6 Compliance with Diet Therapy Among Patients with Type 1 Diabetes Mellitus

Compliance in diet therapy refers to the degree to which patients adhere to prescribed dietary guidelines and recommendations aimed at managing their diabetes. For individuals with Type 1 Diabetes Mellitus (T1DM), compliance is critical, as it directly influences glycemic control and overall health outcomes. Shahabi et al. (2022) highlight that effective dietary compliance can lead to significant improvements in metabolic parameters, reducing the risk of acute complications such as hypoglycemia and long-term complications like cardiovascular disease and neuropathy.

The significance of compliance extends beyond mere adherence to dietary rules; it encompasses a holistic approach to diabetes management. Burayzat et al. (2022) emphasize that when patients comply with diet therapy, they are more likely to achieve better glycemic control, which is essential for maintaining quality of life and preventing complications associated with diabetes. Thus, understanding the factors that influence compliance is vital for healthcare providers aiming to enhance patient outcomes.

Factors Influencing Compliance

Several factors influence compliance with diet therapy among patients with T1DM, including socioeconomic factors, family support, and individual motivation.

Socioeconomic Factors: Socioeconomic status plays a crucial role in dietary compliance. Patients from lower socioeconomic backgrounds may face barriers such as limited access to healthy foods, lack of transportation, or financial constraints that hinder their ability to adhere to dietary recommendations. Pratiwi et al. (2021) found that socioeconomic challenges significantly affect patients' motivations and abilities to follow prescribed diets.

Family Support: Family dynamics significantly impact dietary adherence in T1DM patients. Horikawa et al. (2020) discuss how strong family support systems can enhance compliance by providing emotional encouragement and practical assistance in meal planning and preparation. Conversely, a lack of family support can lead to feelings of isolation and decreased motivation, negatively affecting adherence levels.

Motivation: Individual motivation is another critical factor influencing compliance. Patients who are intrinsically motivated to manage their diabetes are more likely to adhere to dietary guidelines. Studies indicate that motivational interviewing and education can enhance self-efficacy, leading to improved dietary compliance among patients with diabetes.

2.1.7 Challenges Faced by Patients in Adhering to Diet Therapy

Despite the importance of diet therapy, many patients encounter challenges that hinder their ability to comply with dietary recommendations.

Psychological Barriers: Psychological factors such as stress, anxiety, and depression can significantly impact a patient's ability to adhere to diet therapy. Hamidianshirazi et al. (2023) note that emotional distress often leads to unhealthy eating behaviors, making it difficult for patients to follow their prescribed diets.

Social Influences: Social situations such as dining out or attending social gatherings can create temptations that challenge adherence to dietary guidelines. Patients may feel pressured to conform to social norms regarding food consumption, leading them away from their prescribed diets.

While compliance with diet therapy is essential for the effective management of Type 1 Diabetes Mellitus, various factors—including socioeconomic status, family support, motivation, psychological barriers, knowledge gaps, and social influences—play a significant role in determining adherence levels among patients. Addressing these challenges through targeted interventions can improve compliance rates and ultimately enhance health outcomes for individuals living with T1DM.

2.1.8 Factors Influencing Compliance with Diet Therapy

Socio-Demographic Factors

Age, Gender, Educational Level, and Income

Socio-demographic factors play a significant role in the compliance of patients with Type 1 Diabetes Mellitus (T1DM) to diet therapy. Understanding how these factors influence dietary adherence is essential for developing effective management strategies.

Age is a critical factor influencing dietary compliance among T1DM patients. Younger individuals may struggle with adherence due to lifestyle choices, peer influences, and a lack of understanding of their condition. Conversely, older patients often have more experience managing their diabetes but may face challenges related to cognitive decline or physical limitations that affect their ability to prepare healthy meals. Nasution et al. (2022) found that age-related differences in health literacy significantly impacted dietary

compliance, suggesting that tailored educational interventions may be necessary for different age groups.

Gender also plays a role in dietary adherence. Research indicates that women may exhibit different dietary behaviors compared to men, potentially influenced by social roles and responsibilities. Ernawati and Angraini (2024) highlight that gender differences can affect motivation levels and the ability to adhere to dietary guidelines. For instance, women often take on the primary role in meal preparation within families, which can either facilitate or hinder compliance depending on their knowledge and skills regarding healthy cooking.

Educational Level is another significant socio-demographic factor affecting compliance with diet therapy. Higher levels of education are generally associated with better health literacy, leading to improved understanding of dietary guidelines and their importance in managing diabetes. Patients with lower educational attainment may struggle to grasp complex nutritional information, which can result in poor dietary choices and non-compliance. Nasution et al. (2022) emphasize the need for simplified educational materials tailored to the literacy levels of patients to enhance understanding and adherence.

Income also plays a crucial role in dietary compliance. Patients from lower-income backgrounds may have limited access to healthy food options, making it challenging to adhere to recommended dietary practices. Ernawati and Angraini (2024) note that financial constraints can lead individuals to choose cheaper, less nutritious food options, which can negatively impact their health outcomes. Therefore, addressing economic barriers is essential for improving compliance rates among T1DM patients.

Socio-demographic factors such as age, gender, educational level, and income significantly influence the compliance of patients with Type 1 Diabetes Mellitus to diet therapy. Understanding these factors can help healthcare providers design targeted interventions that address specific needs and challenges faced by different patient populations, ultimately improving adherence and health outcomes in diabetes management.

Psychosocial Factors

Role of Self-Efficacy, Motivation, and Social Support

Psychosocial factors significantly influence dietary compliance among patients with Type 1 Diabetes Mellitus (T1DM). Among these factors, self-efficacy—the belief in one's ability to execute behaviors necessary to manage their health—plays a crucial role. Basid and Negara (2023) emphasize that higher levels of self-efficacy are associated with improved adherence to dietary guidelines. Patients who believe they can successfully manage their diet are more likely to engage in healthy eating behaviors and make informed food choices.

Motivation is another critical psychosocial factor affecting compliance. The intrinsic motivation to maintain health and manage diabetes effectively can drive patients to adhere to their diet plans. Novita et al. suggest that understanding the underlying motivations of patients can help healthcare providers tailor interventions that resonate with individual goals and values, thereby enhancing compliance.

Social support also plays a vital role in dietary adherence. Support from family, friends, and healthcare providers can provide the encouragement and accountability needed for patients to stick to their dietary plans. Basid and Negara (2023) highlight the importance of

a supportive environment in fostering positive dietary behaviors, indicating that patients with strong social networks are more likely to maintain compliance with diet therapy.

2.1.9 Health Education and Counseling

Impact of Nutrition Education and Healthcare Provider Communication

Health education and counseling are fundamental components of effective diabetes management, particularly regarding diet therapy for patients with T1DM. Nutrition education equips patients with the knowledge necessary to make informed dietary choices that align with their health goals. Wagustina et al. (2021) found that structured nutrition counseling significantly improved dietary compliance and blood sugar levels among patients with diabetes, demonstrating the effectiveness of educational interventions in promoting better health outcomes.

Effective communication between healthcare providers and patients is essential for successful health education. Saneifard et al. (2024) emphasize that clear communication regarding dietary recommendations can enhance patient understanding and adherence. When healthcare providers take the time to explain the rationale behind dietary guidelines and engage patients in discussions about their preferences and challenges, it fosters a collaborative approach to diabetes management.

Moreover, ongoing support through regular follow-ups and counseling sessions can reinforce the knowledge gained during initial educational interventions. This continuous engagement helps address any emerging challenges related to diet therapy, ensuring that patients remain on track with their dietary goals.

Institutional and Policy Factors

Accessibility and Availability of Dietary Counseling Services

Institutional and policy factors play a crucial role in shaping the accessibility and availability of dietary counseling services for patients with Type 1 Diabetes Mellitus (T1DM). Access to qualified nutrition professionals is essential for providing tailored dietary advice that meets individual patient needs. Nketia et al. (2022) highlight that limited access to nutrition services can hinder patients' ability to adhere to diet therapy, particularly in rural or underserved areas where healthcare resources may be scarce.

Policies that promote the integration of nutrition counseling into diabetes care are vital for enhancing patient outcomes. Oudmaijer et al. (2022) discuss the importance of establishing clear guidelines for nutritional support within healthcare systems, which can help standardize care and ensure that all patients have access to necessary resources.

Additionally, institutional support for ongoing professional development in nutrition education for healthcare providers is essential. Ensuring that providers are well-equipped with the latest knowledge on dietary management of diabetes can improve the quality of care delivered to patients, ultimately fostering better adherence to diet therapy.

Psychosocial factors such as self-efficacy, motivation, and social support significantly influence compliance with diet therapy among T1DM patients. Health education and effective communication between healthcare providers and patients further enhance adherence by equipping individuals with the necessary knowledge and skills. Lastly, institutional and policy factors play a critical role in ensuring access to dietary counseling

services, which is essential for supporting patients in their journey toward effective diabetes management.

2.2 Theoretical Framework

Health Belief Model (HBM)

The Health Belief Model (HBM) is a theoretical framework widely utilized in public health and psychology to understand and predict health-related behaviors. Developed in the 1950s by social psychologists Hochbaum, Rosenstock, and Kegels, the model seeks to explain why individuals adopt or fail to adopt health-promoting behaviors. It posits that health behaviors are influenced by a person's perceptions of their susceptibility to a health condition, the severity of the condition, the benefits of taking preventive action, and the barriers to that action.

Perceived susceptibility

A central tenet of the HBM is perceived susceptibility, which refers to an individual's belief about the likelihood of experiencing a health problem. For patients with Type 1 diabetes mellitus, perceived susceptibility might involve their understanding of how non-compliance with diet therapy increases their risk of complications, such as cardiovascular disease, neuropathy, or renal failure. If individuals perceive themselves as vulnerable, they are more likely to take preventive measures.

Perceived severity

Perceived severity is another key construct, highlighting the individual's belief about the seriousness of the health condition and its consequences. For example, patients who

recognize the debilitating impact of poorly managed Type 1 diabetes on their quality of life may be more motivated to adhere to prescribed dietary guidelines.

Perceived benefits

The HBM also emphasizes perceived benefits, which refer to the individual's belief in the efficacy of the advised behavior in reducing the threat of illness. For patients with diabetes, understanding that compliance with diet therapy can stabilize blood sugar levels and prevent long-term complications reinforces the importance of adherence.

Perceived barriers

However, perceived barriers can hinder compliance despite high perceived susceptibility, severity, and benefits. Barriers may include the cost of healthy foods, lack of access to dietary options, cultural food preferences, or limited time for meal preparation. Identifying and addressing these barriers is crucial for fostering behavioral change.

Cues to action

Cues to action are triggers that prompt individuals to take health-related actions. These can be internal, such as symptoms of hyperglycemia, or external, such as advice from healthcare professionals or reminders through health campaigns. For diabetes patients, structured follow-ups or peer support groups can serve as effective cues.

Self-efficacy

Lastly, self-efficacy—the confidence in one's ability to perform the required behavior—plays a significant role in determining adherence to health recommendations. Patients who

believe they can successfully integrate dietary changes into their daily lives are more likely to comply with diet therapy.

In the context of diet therapy for Type 1 diabetes, the HBM provides a comprehensive framework for exploring how personal beliefs and perceptions influence compliance. By addressing the constructs of the HBM, healthcare providers can design targeted interventions, such as education programs to enhance knowledge about susceptibility and severity, strategies to minimize perceived barriers, and initiatives to boost self-efficacy. These efforts can lead to improved adherence to dietary recommendations, ultimately enhancing health outcomes for patients.

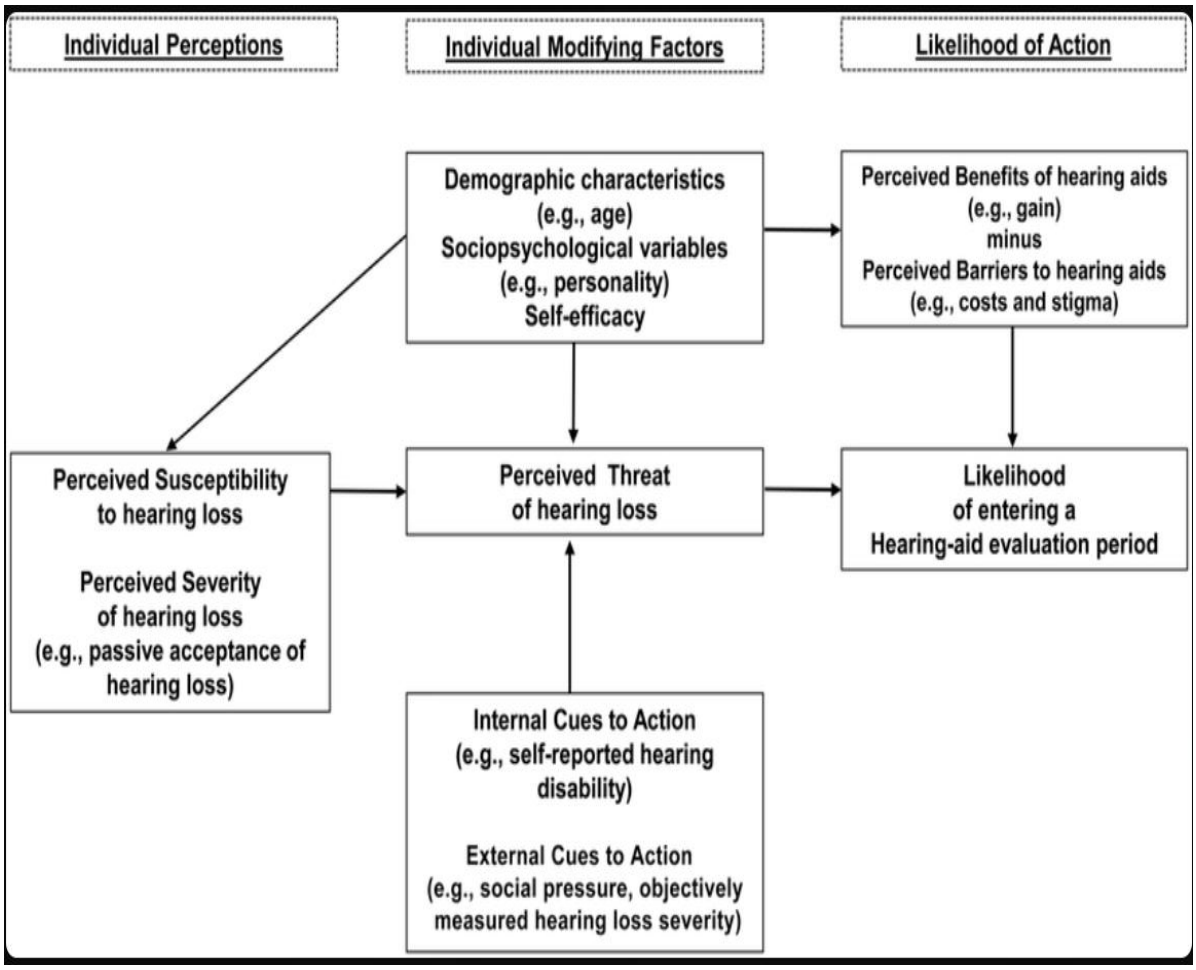

Figure 2.1. Schematic diagram of Health Belief Model by Pronk et al. (2017)

Application to the study

The Health Belief Model (HBM) serves as a valuable framework for understanding the factors influencing compliance with dietary therapy among patients with Type 1 diabetes mellitus. This model provides a structured lens through which the study examines how individual beliefs and perceptions shape health-related behaviors. The HBM's constructs—perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy—offer insights into the motivations and challenges faced by patients in adhering to prescribed dietary guidelines.

In applying the HBM to this study, perceived susceptibility is explored through participants' understanding of their risk for complications resulting from non-compliance with diet therapy. Patients who recognize the potential for serious health issues, such as hyperglycemia, ketoacidosis, or long-term complications like neuropathy and retinopathy, may demonstrate greater motivation to follow dietary recommendations. By assessing the level of awareness about these risks, the study seeks to determine how susceptibility influences adherence.

Perceived severity is equally critical, as it pertains to patients' beliefs about the consequences of non-compliance on their health and quality of life. The study examines how participants evaluate the seriousness of their condition and its impact on their physical and emotional well-being. This understanding is essential for designing interventions that emphasize the importance of compliance to avoid adverse outcomes.

The model's focus on perceived benefits provides a basis for understanding whether participants believe that adhering to dietary guidelines will significantly improve their health outcomes. By identifying the extent to which patients view dietary compliance as a means to stabilize blood glucose levels and prevent complications, the study highlights the motivating factors that encourage adherence.

Conversely, perceived barriers are a key area of exploration, as they often undermine efforts to comply with diet therapy. The study investigates common barriers, such as the cost of healthy foods, cultural or personal food preferences, lack of knowledge about meal planning, and time constraints. Understanding these barriers enables the development of strategies to address and mitigate them, thereby facilitating better compliance.

Cues to action are also examined, as they play an instrumental role in prompting individuals to adopt and maintain healthy behaviors. These cues may include advice from healthcare professionals, educational programs, or symptoms of poorly managed blood glucose levels. The study assesses the influence of such triggers in encouraging participants to comply with dietary therapy.

Lastly, the construct of self-efficacy is critical to the study's application of the HBM. Self-efficacy relates to the confidence patients have in their ability to follow dietary recommendations consistently. By evaluating participants' levels of self-efficacy, the study identifies whether this factor impacts their adherence and explores ways to enhance patients' confidence in managing their dietary needs.

The HBM provides a comprehensive theoretical foundation for investigating the beliefs and behaviors of patients with Type 1 diabetes mellitus in relation to dietary compliance. By applying the model's constructs, the study not only identifies key determinants of adherence but also offers practical insights for designing targeted interventions to improve compliance and overall health outcomes.

2.3 Empirical Review

2.3.1 Knowledge of diet therapy among patients with type 1 diabetes mellitus

In a study by Nketia et al. (2022), the association between nutritional knowledge and dietary compliance among T2DM patients was investigated at Bono Regional Hospital, Sunyani, Ghana. This hospital-based, descriptive cross-sectional study used systematic sampling and semi-structured questionnaires to collect data from 140 T2DM patients. The study found that while 52.1% of respondents demonstrated good nutritional knowledge,

only 39.3% showed good dietary compliance. Significant associations were observed between nutritional knowledge and adherence to dietary components such as complex carbohydrates, low-fat diets, and controlled protein portions. Despite the observed gaps in compliance, the study highlighted the importance of tailored nutritional education programs to promote adherence to dietary recommendations.

However, the study had some limitations. Being a cross-sectional study, it could only establish associations rather than causality, limiting the ability to determine whether better nutritional knowledge directly leads to improved dietary compliance. Additionally, the study relied on self-reported data, which may be subject to recall bias or social desirability bias, potentially affecting the accuracy of dietary compliance measurements. The sample size of 140 participants, while reasonable, may not fully capture variations in dietary behaviors across different populations. Lastly, as the study focused solely on a single hospital, its findings may not be generalizable to broader T2DM populations in different regions.

In a study conducted by Datkayeva et al. (2022), the principles of diet therapy in food planning for type 1 diabetes mellitus (T1DM) in children were examined. The authors conducted a systematic search using PubMed, The Cochrane Library, Scopus, and eLibrary databases, covering a 10-year period from 2011 to 2021. Inclusion criteria focused on randomized controlled trials, cohort studies, systematic reviews, and meta-analyses published in English or Russian. Materials without evidence or from non-academic sources were excluded. Out of 87 identified sources, 43 were selected for detailed analysis. The study found that the processes of carbohydrate assimilation depend on multiple factors

influencing glycemic potential. Additionally, the role of ultrashort insulin preparations was highlighted in reducing postprandial glycemia and preventing early diabetes complications in children. The findings suggest that ultrashort insulin preparations are effective in mitigating complications associated with T1DM in children.

However, certain limitations were observed. The exclusion of non-English and non-Russian studies introduced the possibility of language bias, potentially overlooking relevant research from other regions. Moreover, the study primarily focused on children, which restricts the applicability of its findings to adult patients with T1DM. Additionally, as a literature review, it did not involve primary data collection, relying solely on previously published research, which may limit its ability to provide novel clinical insights.

Builes-Montaño et al. (2022) conducted a systematic review and meta-analysis to evaluate the efficacy and safety of carbohydrate counting in T1DM patients. This review included randomized controlled trials with a minimum follow-up period of three months. A total of 11 studies comprising 899 patients were analyzed. The findings showed that carbohydrate counting reduced glycated hemoglobin (HbA1c) levels significantly when compared with standard dietary advice, especially after accounting for heterogeneity. Furthermore, carbohydrate counting did not cause substantial changes in blood lipids, body weight, or hypoglycemia risk, nor did it affect the total daily insulin dose. The authors concluded that carbohydrate counting is a safe and effective technique to lower HbA1c levels in both adults and children with T1DM, emphasizing the need for standardized reporting of outcomes such as hypoglycemia and quality of life in future trials.

Despite the strength, the study had certain weaknesses. One limitation was the presence of heterogeneity among the included studies, which could affect the generalizability of the findings. Variability in study designs, patient populations, and intervention protocols may have contributed to inconsistencies in reported outcomes. Additionally, while the study confirmed the efficacy of carbohydrate counting in lowering HbA1c, it did not extensively explore patient adherence, practical challenges, or long-term sustainability of this dietary approach. The study also lacked a detailed assessment of potential psychological or behavioral factors influencing the success of carbohydrate counting in different patient groups. Lastly, although carbohydrate counting was found to be safe, further research is needed to explore its impact on quality of life and patient satisfaction, aspects that were not thoroughly addressed in the included trials.

2.3.2 Level of compliance with diet therapy among patients with type 1 diabetes mellitus

In a study conducted by Pratiwi, Riduansyah, and Gaghauna (2021), the relationship between patient motivation and dietary compliance in diabetes mellitus patients was examined. This cross-sectional study was carried out at the Haruai Health Center, and a purposive sampling technique was employed, involving 43 participants (25% of the total population). The findings, based on Spearman Rank (Rho) analysis, indicated a significant positive correlation between patient motivation and dietary compliance, with a p-value of 0.000. The study concluded that higher motivation levels among patients were associated with better adherence to dietary recommendations, emphasizing the importance of motivational strategies in dietary management for diabetes.

However, the study had several limitations. The use of a purposive sampling technique with only 43 participants (representing 25% of the total population) limited the generalizability of the findings. The small sample size reduces the ability to apply the results to a broader diabetic population. Additionally, the cross-sectional design meant that while associations between motivation and dietary adherence were observed, causality could not be established. Other potential influencing factors, such as socioeconomic status, education level, and psychological well-being, were not extensively explored. Furthermore, the reliance on self-reported data for dietary compliance introduces the possibility of recall bias or social desirability bias, potentially affecting the accuracy of the results.

A case report by Koutnik et al. (2024) examined the long-term effects of a ketogenic diet (≤50 g carbohydrates/day) on glycemic control in a patient with type 1 diabetes over 10 years. The ketogenic diet successfully maintained glycemic control, as evidenced by HbA1c levels of 5.5% (36.6 mmol/mol), a median glucose level of 98 mg/dL, and 90% glucose time-in-range. Daily insulin requirements were reduced by 43%, with no adverse effects on thyroid or kidney function, or bone mineral density. Although low-density lipoprotein cholesterol levels increased, small-dense low-density lipoprotein levels remained normal. The study demonstrated the potential of a long-term ketogenic diet as an effective therapeutic strategy for type 1 diabetes.

Despite its strengths, the study had notable limitations. As a single-patient case report, its findings cannot be generalized to the broader type 1 diabetes population. Individual variations in metabolism, genetics, and lifestyle factors may influence the effectiveness of the ketogenic diet, meaning similar results might not be achievable for all patients. Additionally, while the study reported an increase in low-density lipoprotein (LDL)

cholesterol levels, it did not fully explore the potential long-term cardiovascular risks associated with this dietary approach. The absence of a control group also made it difficult to compare outcomes against standard dietary recommendations. Future research, particularly randomized controlled trials, would be necessary to validate the efficacy and safety of a ketogenic diet for larger populations with type 1 diabetes.

2.3.2 Factors influencing compliance with diet therapy among patients with type 1 diabetes mellitus

Despite these strengths, the study had some limitations. The sample size of 60 patients, while appropriate for an RCT, was relatively small, limiting the generalizability of the findings to larger diabetic populations. The study was also conducted in a single hospital setting, which may not reflect the diversity of healthcare systems and patient demographics in different regions. Additionally, while the study assessed short-term compliance improvements, it did not include a long-term follow-up to determine whether the benefits of telenursing persisted over time. Another potential limitation was the reliance on self-reported data, which might have been influenced by response bias. Future research with larger, multicenter trials and longer follow-up periods would be beneficial to further establish the effectiveness of telenursing in diabetes management.

In a systematic review and meta-analysis by Burayzat et al. (2022), the effects of a gluten-free diet (GFD) on BMI and glycosylated hemoglobin (HA1C) in children with type 1 diabetes mellitus (T1DM) and asymptomatic celiac disease (CD) were evaluated. Following PRISMA guidelines, data from six case-control studies were analyzed. The results showed no significant differences in BMI or HA1C after 12 months on a GFD. However, HDL cholesterol levels improved significantly. The study concluded that while a

GFD may not impact BMI or HA1C, it can help prevent complications associated with DM and CD.

Despite these strengths, the study had some limitations. The inclusion of only six case-control studies limited the robustness of the meta-analysis, as a larger number of high-quality randomized controlled trials would provide stronger evidence. Additionally, the study did not assess the long-term sustainability of a GFD, which is a crucial factor in dietary interventions for chronic diseases. The findings may also be influenced by variations in study design, sample sizes, and participant characteristics across the included studies. Future research should focus on randomized controlled trials with larger sample sizes and longer follow-up periods to better understand the long-term effects of a GFD in children with T1DM and asymptomatic CD.

2.4 Summary of literature review

The literature review explored existing studies and theoretical frameworks related to compliance with dietary therapy among patients with Type 1 diabetes mellitus. It examined the global and regional prevalence of Type 1 diabetes, highlighting the significance of effective management strategies, particularly dietary therapy, in mitigating complications and improving quality of life. Previous research underscored the critical role of dietary adherence in blood glucose control, while also identifying common challenges such as knowledge gaps, cultural influences, financial constraints, and lack of motivation.

Various studies were reviewed to identify patterns and insights into factors influencing dietary compliance. These factors included demographic characteristics, socioeconomic status, educational background, access to healthcare resources, and support systems. Key

barriers and enablers to dietary adherence were discussed, providing a foundation for understanding patient behaviors and designing targeted interventions.

The review also incorporated the Health Belief Model (HBM) as the theoretical framework guiding this study. The HBM constructs—perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy—were applied to explain how individual beliefs and perceptions influence compliance with dietary therapy. The model's application emphasized the importance of addressing both motivational and structural barriers to enhance adherence. While the literature highlights various factors influencing dietary compliance in T1DM patients globally, there is a noticeable gap in research specifically focusing on the assessment of compliance within tertiary health institutions in Benin City. Many studies explore general adherence behaviors or the impact of specific interventions, but a comprehensive understanding of the unique challenges and determinants of dietary compliance in a tertiary care setting within your specific context remains limited. Furthermore, while studies have explored knowledge and attitudes towards T1DM, few have directly linked these factors to actual dietary practices in the specific population of interest in your study. This study aims to address this gap by providing a detailed assessment of dietary compliance and its influencing factors among T1DM patients in a tertiary health institution, thereby informing targeted interventions to improve patient outcomes.

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter described the methodology that the researcher adopted in conducting this study. The various components of the research methodology was 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

The study utilized a descriptive cross-sectional survey design. This non-experimental approach is suitable for gathering information on the assessment of compliance to diet-therapy among patients with diabetes mellitus type 1 in tertiary health institution at a specific point in time. The descriptive cross-sectional survey method allowed for the exploration of relationships between various influencing factors and compliance levels. It is cost-effective and efficient, providing valuable insights that can inform interventions aimed at improving immunization rates (Aleid et al., 2023)

3.2 Research Setting

The research was 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 comprised of patients that came to COPD of the UBTH for two months from February 2025 to March 2025.

February 2024							
ENDOCRINOLOGY	**Old**		**New**		**NHIS**		
	M	**F**	**M**	**F**	**M**	**F**	**Total**
	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
Total							335

March

ENDOCRINOLOGY	March 2025						
	Old		New		NHIS		
	M	**F**	**M**	**F**	**M**	**F**	**Total**
	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
Total							303

Statistics for the month of February 2025 – March 2025 (MOP Clinic UBTH)

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

3.4 Sample Size and Formula

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

The formula is given as follows

n =

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)

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

n =

n =

n =

n =

n =

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

10 x177=17.7
100 1

:. n = 177 +17.7

=194.7 approximately, 195

3.5 Sampling Technique

The sampling technique employed was convenience sampling. Convenience sampling is a non-probability sampling technique where participants are selected based on their easy accessibility and proximity to the researcher. This method involves choosing individuals who are readily available and willing to participate, rather than selecting a random sample from the entire population (Adeoye, 2023).

3.6 Instrument for Data Collection

The instrument for data collection for this study was a self-structured questionnaire (Appendix I). A self-structured questionnaire is a data collection instrument designed by researchers to gather information directly from respondents without the need for an interviewer. It consisted of a series of standardized questions formulated in advance, allowing respondents to provide their answers independently. This type of questionnaire

included various question formats, such as closed-ended questions (which offer predefined response options) and open-ended questions (which allow for free-form responses (Ojo-Agbodu et al., 2022). The questionnaire was developed based on the objectives of the study. It consisted of four sections with carefully drafted, sequenced, and constructed items designed to gather in-depth, useful, and relevant information for the study.

- **Section A**: Demographic data (e.g, age, marital status, educational level).
- **Section B**: knowledge of diet therapy.
- **Section C**: level of compliance with diet therapy
- **Section D**: factors influencing compliance with diet therapy

3.7 Validity of the Instrument

Validity refers to how well an 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, University of Benin. Due corrections were made before it was distributed. The questionnaire measured what it was supposed to measure and ensured its face and content validity.

3.8 Reliability of the Instrument

This refers to the consistency of a measure according to Nwachukwu, (2015). To ensure the reliability of the instrument, the reliability of instrument was determined through test re-test method. 10% of the sampled population which is 200 respondents were administered questionnaire. The patient comprised of Diabetes patients attending

Outpatient clinic at Edo Specialist Hospital (which were not part of the study) outside the sample size. A correlation coefficient of 0.82 was obtained and considered satisfactory enough to establish that the instrument was reliable for the study.

3.9 Method of Data Collection

A well-structured questionnaire was administered to participants until the required sample size of 195 was reached. With approval from the unit head, the study's purpose was explained to patient attending the clinic, and they were invited to complete the questionnaire. Data collection took place during regular clinic days over a two-week period from April 15, 2025 to April 29, 2025. The researcher administered the questionnaires directly and ensured that all completed forms are collected on the same day.

3.10 Method of Data Analysis

Data collected from completed questionnaires was analyzed using Statistical Package for Social Sciences (SPSS) version 27.0. Descriptive statistics such as means, frequencies, and percentages was used to summarize demographic data and responses related to knowledge and compliance levels. Inferential statistics, including Chi-square tests, examined associations between demographic factors and compliance levels, with significance set at $p < 0.05$.

3.11 Ethical Considerations

Ethical approval for this study was obtained from the Health Research Ethics Committee of the University of Benin Teaching Hospital, Benin City, Edo State. Participation in the study was voluntary, and no personal identifiers were recorded on the questionnaires which

ensured participants' anonymity. Letters was given to parents of patients who are below 18 years to give them permission to participate since they are not adult.

Informed Consent: Before the administration of the questionnaire, the researcher verbally explained the study's objectives to the participants. They were encouraged to ask any questions to clarify any uncertainties and were only provided with information they are comfortable with.

Confidentiality: All information provided by participants was treated as confidential, regardless of whether legal protection is afforded to it. Participants' identities remained anonymous, and their responses kept confidential throughout the study.

Autonomy: Participation was entirely voluntary, with no coercion or undue influence. Participants' rights, dignity, and autonomy were respected at all times. An autonomous participant is one who is free to make decisions about their participation based on full understanding.

Veracity: Accurate and truthful information about the study was provided to participants, ensuring no vital details are withheld or misrepresented.

Beneficence and Non-maleficence: The researcher ensured that no participant was harmed in any way—physically, emotionally, socially, or psychologically. The well-being of participants was priorities throughout the study.

Principle of Justice: Every participant was treated fairly, and equal attention was given to all respondents, ensuring no bias or discrimination in the process.

CHAPTER FOUR

RESULT AND FINDINGS

This chapter deals with the representation of data collected regarding the assessment of compliance to diet-therapy among patients with diabetes mellitus type 1 in tertiary health institution. A total of 195 questionnaires were distributed to patients that came to COPD of the UBTH for two months, 187 were properly filled and valid for data analysis, giving a response rate of 95.9%.

Table 4.1: Socio-demographic characteristics of respondents

Variable	Frequency (n = 187)	Percent (%)
Age		
4 – 10 years	7	3.7
11 – 17 years	11	5.9
18 – 24 years	24	12.8
25 – 31 years	42	22.5
32 – 37 years	103	55.1
Gender		
Male	85	45.5
Female	102	54.5
Ethnicity		
Edo	98	52.4
Hausa	9	4.8
Igbo	36	19.3
Yoruba	31	16.6
Others	13	7.0
Highest Level of Education		
Primary	19	10.2

Secondary	66	35.3
Tertiary	79	42.2
Postgraduate	16	8.6
Not educated	7	3.7
Marital Status		
Married	114	61.0
Single	58	31.0
Divorced	9	4.8
Widowed	6	3.2

Table 4.1 Cont'd

Variable	Frequency (n = 187)	Percent (%)
Religion		
Christianity	149	79.7
Islamic	30	16.0
Traditional	5	2.7
Others	3	1.6
Occupation		
Civil Servant	58	31.0
Trader	72	38.5
Business	49	26.2

Table 4.1 presents the socio-demographic characteristics of the respondents. The majority of respondents (55.1%) were aged between 32 and 37 years, while 22.5% were between 25 and 31 years, and 12.8% were aged 18 to 24 years. A smaller proportion (5.9%) were between 11 and 17 years, and 3.7% were aged 4 to 10 years. In terms of gender, more than half of the respondents were female (54.5%), while males accounted for 45.5%. Regarding

ethnicity, over half of the respondents (52.4%) were Edo, followed by Igbo (19.3%), Yoruba (16.6%), Hausa (4.8%), and others (7.0%). The educational background showed that 42.2% had attained tertiary education, 35.3% had secondary education, 10.2% had primary education, 8.6% had postgraduate degrees, and 3.7% had no formal education. Most respondents were married (61.0%), while 31.0% were single, 4.8% divorced, and 3.2% widowed. In terms of religion, the majority identified as Christians (79.7%), followed by Muslims (16.0%), with a small proportion practicing traditional (2.7%) or other religions (1.6%). Occupationally, 38.5% were traders, 31.0% were civil servants, and 26.2% were engaged in business activities.

Answering Research Questions

Research Question 1: What is the knowledge of diet therapy among patients with type 1 diabetes mellitus in tertiary health institution?

Table 4.2: Knowledge of diet therapy among respondents

Items	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean	Remark
I understand the concept of carbohydrate counting and how it impacts blood sugar levels.	79(42.2)	67(35.8)	28(15.0)	13(7.0)	3.1	Good
I am aware of the recommended daily carbohydrate intake for individuals with type 1 diabetes.	73(39.0)	68(36.4)	34(18.2)	12(6.4)	3.1	Good
I know how my diet affects my insulin requirements.	81(43.3)	66(35.3)	26(13.9)	14(7.5)	3.1	Good
I can adjust my diet based on my insulin dose.	66(35.3)	71(38.0)	36(19.3)	14(7.5)	3	Good
I am knowledgeable about which foods are considered healthy for managing my blood sugar levels.	83(44.4)	72(38.5)	20(10.7)	12(6.4)	3.2	Good
I know the difference between low and high glycemic index foods.	74(39.6)	70(37.4)	30(16.0)	13(7.0)	3.1	Good
I understand the importance of meal timing in managing blood sugar levels.	80(42.8)	69(36.9)	25(13.4)	13(7.0)	3.2	Good
I know how to time my meals in relation to my insulin injections.	77(41.2)	68(36.4)	30(16.0)	12(6.4)	3.1	Good
I understand how portion control can help manage my blood sugar levels.	82(43.9)	66(35.3)	27(14.4)	12(6.4)	3.2	Good
I am aware of how the size of my meals affects my blood sugar.	75(40.1)	67(35.8)	33(17.6)	12(6.4)	3.1	Good
I know which foods should be limited or avoided to maintain healthy blood sugar levels.	84(44.9)	69(36.9)	22(11.8)	12(6.4)	3.2	Good
I am aware of the importance of reducing sugar intake to control my diabetes.	86(46.0)	68(36.4)	21(11.2)	12(6.4)	3.2	Good
I feel well-informed about diet therapy through the diabetes education programs available to me.	71(38.0)	65(34.8)	38(20.3)	13(7.0)	3	Good
The information provided by healthcare providers has increased my understanding of diet therapy for diabetes management.	76(40.6)	70(37.4)	29(15.5)	12(6.4)	3.1	Good
I feel confident in managing my diet to control my diabetes.	78(41.7)	69(36.9)	29(15.5)	11(5.9)	3.1	Good
			Grand Mean		**3.1**	**Good**

Mean Cut-off = 2.5

Table 4.2 shows that respondents demonstrated good knowledge of diet therapy for diabetes management. The mean scores for all the items ranged between 3.0 and 3.2, with a grand mean of 3.1, which falls above the cutoff point of 2.5, indicating a good level of knowledge. The highest mean score of 3.2 was recorded in areas such as awareness of healthy foods for managing blood sugar levels, understanding the importance of meal timing, knowledge of portion control, knowledge of foods to limit or avoid, and awareness of the importance of reducing sugar intake. This suggests that respondents are particularly knowledgeable about practical aspects of diet management. A mean score of 3.1 was observed for several items, including understanding carbohydrate counting, knowledge of diet's effect on insulin requirements, differentiating between low and high glycemic index foods, timing of meals in relation to insulin injections, awareness of the impact of meal size, understanding healthcare information, and confidence in managing diet. Meanwhile, a slightly lower mean score of 3.0 was recorded for the ability to adjust diet based on insulin dose and feeling well-informed through diabetes education programs. Although slightly lower, this still reflects a good level of knowledge. Overall, the grand mean of 3.1 indicates that respondents possess a good knowledge of diet therapy, which is essential for effective diabetes management.

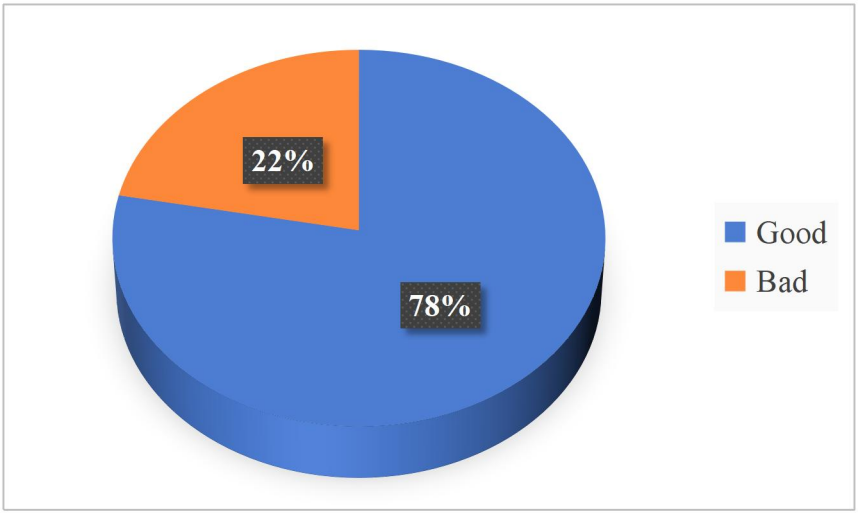

Figure 4.1: Pie chart showing knowledge of diet therapy among respondents

Figure 4.1 reveals that 146 respondents (78%) have good knowledge of diet therapy, while 41 respondents (22%) have poor knowledge.

Research Question 2: What is the level of compliance with diet therapy among patients with type 1 diabetes mellitus in tertiary health institution?

Table 4.3: Compliance with diet therapy among respondents

Items	Always	Sometimes	Rarely	Never	Mean	Remark
I follow my recommended meal plan for managing my blood sugar levels.	107(57.2)	49(26.2)	18(9.6)	13(7.0)	3.3	High
I eat balanced meals that include carbohydrates like rice, proteins like meat, legumes, and fish, and healthy fats from foods like avocados, nuts, and olive oil.	94(50.3)	61(32.6)	18(9.6)	14(7.5)	3.3	High
I monitor my carbohydrate intake as advised by my healthcare provider.	81(43.3)	66(35.3)	27(14.4)	13(7.0)	3.1	High
I avoid sugary foods and beverages to control my blood sugar.	103(55.1)	58(31.0)	14(7.5)	12(6.4)	3.3	High
I consume high-fiber foods such as vegetables, whole grains, and legumes.	99(52.9)	62(33.2)	16(8.6)	10(5.3)	3.3	High
I eat at regular meal times without skipping meals.	105(56.1)	55(29.4)	19(10.2)	8(4.3)	3.4	High
I choose healthy snacks such as nuts, yogurt, or fruits instead of processed snacks.	90(48.1)	71(38.0)	16(8.6)	10(5.3)	3.3	High
I measure portion sizes to prevent overeating or under-eating.	87(46.5)	72(38.5)	18(9.6)	10(5.3)	3.3	High
I follow dietary recommendations when eating out or attending social gatherings.	76(40.6)	75(40.1)	20(10.7)	16(8.6)	3.1	High
I drink plenty of water instead of sugary drinks or sodas.	110(58.8)	55(29.4)	16(8.6)	6(3.2)	3.4	High
I reduce my intake of fried and high-fat foods as recommended.	90(48.1)	70(37.4)	18(9.6)	9(4.8)	3.3	High
I seek guidance from a dietitian or healthcare professional when unsure about my diet.	82(43.9)	70(37.4)	24(12.8)	11(5.9)	3.2	High
I prepare home-cooked meals that align with my diet plan.	97(51.9)	63(33.7)	18(9.6)	9(4.8)	3.3	High
I read food labels to check for sugar content before consuming packaged foods.	93(49.7)	61(32.6)	22(11.8)	11(5.9)	3.3	High
I take my meals in accordance with my insulin schedule.	102(54.5)	58(31.0)	16(8.6)	11(5.9)	3.3	High
			Grand Mean		**3.3**	**High**

Mean Cut-off = 2.5

The data presented in Table 4.3 shows that respondents demonstrated high compliance with diet therapy for diabetes management. The mean scores for all items ranged between 3.1 and 3.4, with a grand mean of 3.3, indicating a generally high level of compliance. The highest mean score of 3.4 was recorded for eating at regular meal times without skipping meals and drinking plenty of water instead of sugary drinks. This suggests that respondents are highly consistent in maintaining regular eating patterns and in making healthy beverage choices. A mean score of 3.3 was noted for several important aspects of dietary compliance, including following the recommended meal plan, eating balanced meals, avoiding sugary foods and beverages, consuming high-fiber foods, choosing healthy snacks, measuring portion sizes, reducing intake of fried and high-fat foods, preparing home-cooked meals aligned with diet plans, reading food labels, and taking meals according to insulin schedules. These results show that respondents adhered well to practical dietary recommendations. A mean score of 3.2 was recorded for seeking guidance from a dietitian or healthcare professional when unsure about their diet, while a mean score of 3.1 was recorded for monitoring carbohydrate intake and following dietary recommendations at social gatherings. Overall, the grand mean of 3.3 indicates that respondents exhibited high compliance with diet therapy recommendations essential for effective blood sugar management.

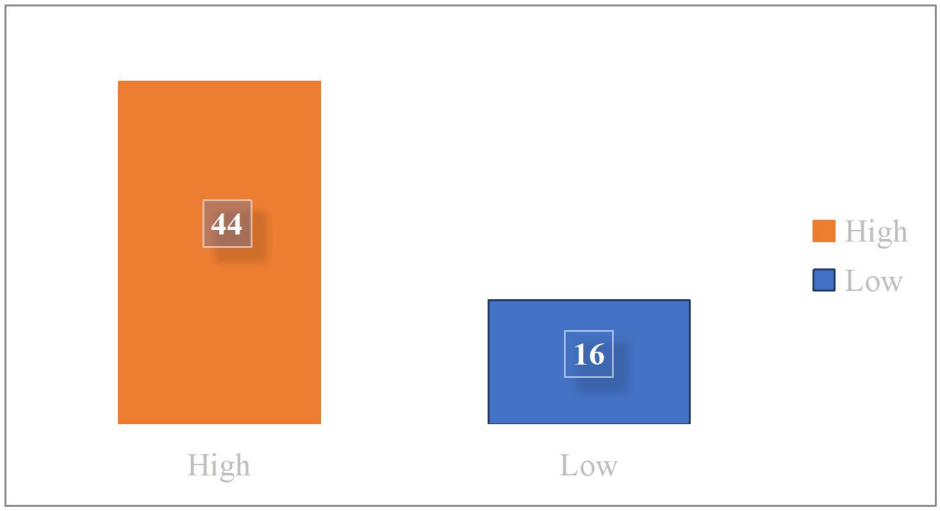

Figure 4.2: Bar chart showing compliance with diet therapy among respondents

Figure 4.2 shows that 157 respondents (78.1%) demonstrated high compliance with diet therapy, while 44 respondents (21.9%) exhibited low compliance.

Research Question 3: What are the factors influencing compliance with diet therapy among patients with type 1 diabetes mellitus in tertiary health institution?

Table 4.4: Factors influencing compliance with diet therapy

Items	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean	Remark
I have enough knowledge about diet therapy to follow my recommended meal plan.	105(56.1)	55(29.4)	20(10.7)	7(3.7)	3.4	Influential
The cost of healthy food options affects my ability to comply with diet therapy.	93(49.7)	58(31.0)	26(13.9)	10(5.3)	3.3	Influential
Limited availability of diabetes-friendly foods influences my diet choices.	80(42.8)	72(38.5)	23(12.3)	12(6.4)	3.2	Influential
Family and social support encourage me to follow my dietary recommendations.	107(57.2)	56(29.9)	15(8.0)	9(4.8)	3.4	Influential
Lack of time to prepare healthy meals affects my compliance with diet therapy.	86(46.0)	74(39.6)	20(10.7)	7(3.7)	3.3	Influential
I find it difficult to resist unhealthy foods, even though I know they affect my blood sugar levels.	116(62.0)	53(28.3)	12(6.4)	6(3.2)	3.5	Influential
Cultural food preferences make it hard for me to strictly follow my diet plan.	91(48.7)	63(33.7)	22(11.8)	11(5.9)	3.3	Influential
Healthcare professionals provide adequate guidance on how to manage my diet effectively.	102(54.5)	63(33.7)	15(8.0)	7(3.7)	3.4	Influential
I feel motivated to comply with diet therapy because of the health benefits.	110(58.8)	55(29.4)	14(7.5)	8(4.3)	3.4	Influential
Stress and emotional factors make it difficult for me to maintain a healthy diet.	112(59.9)	51(27.3)	16(8.6)	8(4.3)	3.4	Influential

Table 4.4 Cont'd

Items	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean	Remark
The support of my healthcare provider positively influences my adherence to diet therapy.	120(64.2)	51(27.3)	12(6.4)	4(2.1)	3.5	Influential
Confusion about food portions and meal planning affects my compliance with diet therapy.	94(50.3)	72(38.5)	15(8.0)	6(3.2)	3.4	Influential
I believe strict adherence to diet therapy significantly improves my health outcomes.	113(60.4)	54(28.9)	15(8.0)	5(2.7)	3.5	Influential
Peer pressure and social events make it challenging to stick to my diet plan.	97(51.9)	68(36.4)	16(8.6)	6(3.2)	3.4	Influential
My level of physical activity influences my dietary choices.	92(49.2)	68(36.4)	17(9.1)	10(5.3)	3.3	Influential
			Grand Mean		**3.4**	**Influential**

Mean Cut-off = 2.5

The data presented in Table 4.4 shows that all listed factors were influential in determining respondents' compliance with diet therapy, with mean scores ranging from 3.2 to 3.5. The grand mean was 3.4, indicating that, overall, the factors were highly influential. The highest mean score of 3.5 was recorded for difficulty resisting unhealthy foods despite knowledge of their effects, the positive influence of healthcare provider support on adherence, and the belief that strict adherence to diet therapy significantly improves health outcomes. This suggests that emotional and motivational factors, as well as professional support, strongly influence dietary compliance. Several factors had a mean score of 3.4, including having enough knowledge about diet therapy, encouragement from family and

social support, adequate guidance from healthcare professionals, motivation due to perceived health benefits, the impact of stress and emotional factors, confusion about food portions and meal planning, and challenges posed by peer pressure and social events. These findings highlight the role of knowledge, support systems, emotional well-being, and social environments in influencing compliance. Factors such as the cost of healthy food options, lack of time for meal preparation, cultural food preferences, and the influence of physical activity on dietary choices each recorded a mean score of 3.3, while limited availability of diabetes-friendly foods had a slightly lower mean of 3.2. These practical barriers also played a significant role in respondents' ability to adhere to diet therapy.

Overall, the grand mean of 3.4 demonstrates that multiple factors — emotional, social, practical, and professional — were influential in shaping respondents' compliance with diet therapy.

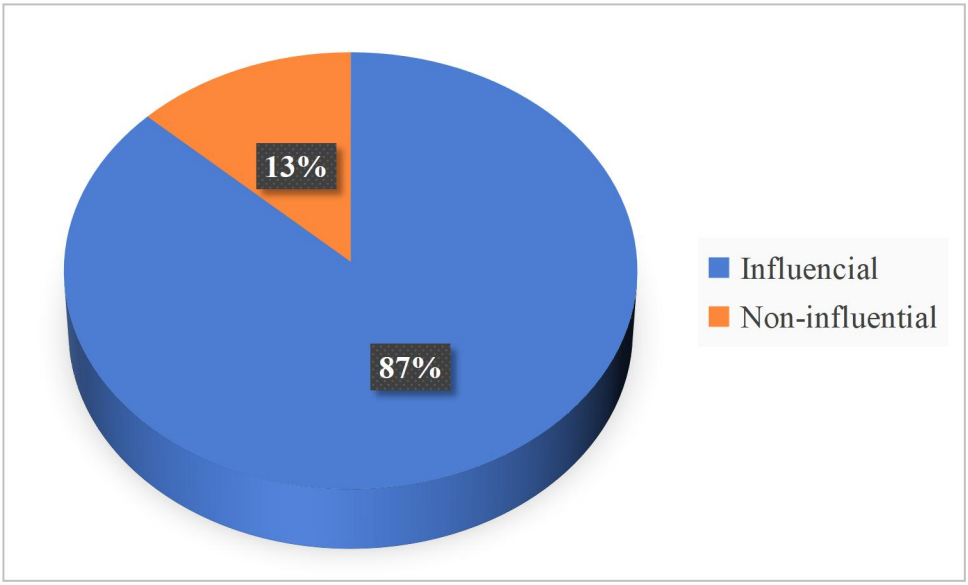

Figure 4.3: Pie chart showing factors influencing compliance with diet therapy

Figure 4.3 shows that out of 187 respondents, 162 (87%) identified factors as influential in compliance with diet therapy, while 25 (13%) considered them non-influential.

Hypothesis Testing

There is no significant difference between the knowledge of diet therapy and level of compliance with diet therapy among patients with diabetes mellitus type 1 in tertiary health institution.

Table 4.5: Relationship between the knowledge of diet therapy and level of compliance with diet therapy among patients with diabetes mellitus type 1

Level of compliance	Knowledge		Test Statistics (χ^2)	df	P value	Decision
	Good	**Poor**				
High	146(78.1)	41(21.9)	2.1037	1	0.15	**Accepted**
Low	157(84.0)	30(16.0)				

Table 4.5 shows that among respondents with high compliance, 146 (78.1%) had good knowledge of diet therapy while 41 (21.9%) had poor knowledge; among those with low compliance, 157 (84.0%) had good knowledge and 30 (16.0%) had poor knowledge. The chi-square test ($\chi^2 = 2.1037$, df = 1, p = 0.15) indicates no significant difference between knowledge of diet therapy and level of compliance, thus the null hypothesis is accepted.

CHAPTER FIVE

DISCUSSION AND 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 practice of nosocomial infection control among nurses in Edo Specialist Hospital Benin City, Edo State. The socio-demographic profile of the study participants reveals several noteworthy characteristics that can be meaningfully compared with previous research. The age distribution shows a predominant concentration (55.1%) in the 32-37 years age group, with decreasing proportions in younger age brackets, down to 3.7% in the 4-10 years category. This age distribution differs from studies like Datkayeva et al. (2022), which focused exclusively on pediatric populations, and offers a broader perspective on diet therapy across different age groups. Gender distribution shows a relatively balanced representation with a slight female majority (54.5% female vs. 45.5% male). This balanced gender representation strengthens the study's generalizability compared to some previous research that may have had more skewed gender distributions. The ethnic composition reflects a predominantly Edo population (52.4%), followed by Igbo (19.3%) and Yoruba (16.6%), providing important context for understanding cultural influences on dietary practices that wasn't captured in studies like Burayzat et al. (2022) or Builes-Montaño et al. (2022). Educational status demonstrates that most respondents have formal education, with 42.2% having tertiary education and 35.3% secondary education. Only 3.7% reported no formal education. This

relatively high educational level might partially explain the high knowledge levels found in the study, contrasting with Nketia et al.'s (2022) findings where educational barriers were more prominent. The marital status distribution shows a majority (61%) being married, followed by single individuals (31%), with smaller proportions of divorced (4.8%) and widowed (3.2%) participants. This demographic characteristic could be relevant to understanding social support systems, which Pratiwi, Riduansyah, and Gaghauna (2021) identified as crucial for dietary compliance. Religious affiliation shows a predominant Christian population (79.7%), followed by Islamic adherents (16%), with minimal representation of traditional (2.7%) and other religions (1.6%). This religious distribution could influence dietary practices and compliance, though this aspect wasn't extensively explored in previous studies. Occupational distribution reveals a mix of traders (38.5%), civil servants (31%), and business people (26.2%), suggesting varied socioeconomic backgrounds and lifestyle patterns. This occupational diversity provides important context for understanding practical challenges in dietary compliance, such as time constraints and access to healthy food options, which weren't thoroughly addressed in studies like Koutnik et al.'s (2024) case report. These demographic characteristics provide crucial context for interpreting the study's findings on knowledge, compliance, and influencing factors in diet therapy. The relatively high educational levels and diverse occupational background might explain the higher knowledge and compliance rates compared to previous studies, while the ethnic and religious distribution offers insight into cultural influences on dietary practices.

Knowledge of diet therapy among patients with type 1 diabetes mellitus

The findings from the study reveal a significantly high level of diet therapy knowledge among respondents, with 78% demonstrating good knowledge and only 22% showing poor knowledge. This represents a markedly higher proportion compared to Nketia et al.'s (2022) study, which found only 52.1% of respondents demonstrating good nutritional knowledge. The detailed analysis of diet therapy knowledge components shows consistently positive responses across all measured aspects. Respondents demonstrated particularly strong understanding in several critical areas of diabetes management. The highest levels of understanding were observed in areas related to sugar intake reduction (82.4% agreeing or strongly agreeing), identification of healthy foods for blood sugar management (82.9%), and understanding portion control (79.2%). These findings align well with the emphasis placed on comprehensive dietary knowledge in Builes-Montaño et al.'s (2022) systematic review, which highlighted the importance of understanding carbohydrate counting and dietary management. Knowledge regarding insulin-diet relationships was also notably strong, with 78.6% of respondents understanding how diet affects insulin requirements, and 77.6% comprehending meal timing in relation to insulin injections. This aligns with Datkayeva et al.'s (2022) findings on the importance of coordinating insulin administration with dietary intake for optimal glycemic control in T1DM management. The study also revealed high confidence levels in dietary self-management, with 78.6% of respondents feeling confident in managing their diet for diabetes control. Additionally, 73.3% of respondents attributed their understanding to healthcare providers' education, highlighting the effectiveness of formal diabetes education programs. This contrasts somewhat with Nketia et al.'s findings, which identified significant gaps between knowledge and practical

application. However, while knowledge levels are impressively high across all measured parameters (with a grand mean of 3.1), this finding should be considered alongside the persistent challenge of translating knowledge into practice, as highlighted in previous studies. The high level of theoretical understanding demonstrated in the current study does not necessarily guarantee equivalent levels of dietary compliance, a phenomenon consistently observed in diabetes management research. The comprehensive understanding shown by respondents in areas such as carbohydrate counting (78% agreement), glycemic index differentiation (77%), and portion control suggests that educational initiatives have been successful in conveying key dietary management concepts. However, these findings should be interpreted within the context of known challenges in dietary compliance, as documented in previous research, suggesting that knowledge alone may not be sufficient for optimal diabetes management.

Level of compliance with diet therapy among patients with type 1 diabetes mellitus

The current study reveals a remarkably high level of dietary compliance among respondents, with 78.1% demonstrating high compliance and only 21.9% showing low compliance. This finding presents a striking contrast to Nketia et al.'s (2022) study, which reported only 39.3% of participants showing good dietary compliance, suggesting potentially significant improvements in adherence to dietary recommendations or differences in study populations and measurement approaches. Detailed analysis of compliance behaviors shows consistently high adherence across various aspects of diet therapy. The highest compliance rates were observed in maintaining regular meal times (85.5% always or sometimes compliant) and hydration practices (88.2% regularly choosing water over sugary drinks). This aligns with the findings from Datkayeva et al.'s

(2022) study, which emphasized the importance of meal timing in glycemic control, particularly in relation to insulin administration. Particularly noteworthy is the high compliance with carbohydrate monitoring (78.6% always or sometimes compliant), which corresponds well with Builes-Montaño et al.'s (2022) meta-analysis findings on the effectiveness of carbohydrate counting in reducing HbA1c levels. The current study shows that participants not only understand but actively implement carbohydrate monitoring in their daily routines. The study also reveals strong adherence to balanced meal consumption, with 82.9% of respondents regularly including appropriate proportions of carbohydrates, proteins, and healthy fats. This comprehensive approach to meal planning aligns with current dietary recommendations and contrasts interestingly with Koutnik et al.'s (2024) case report on ketogenic diet effectiveness, suggesting that traditional balanced meal approaches remain the predominant dietary strategy among T1DM patients. Social and practical aspects of dietary management show relatively lower, though still substantial, compliance rates. For example, 80.7% of respondents regularly follow dietary recommendations when eating out or attending social gatherings, while 81.3% consistently seek professional guidance when uncertain about their diet. These findings suggest that while challenging situations exist, most participants maintain their dietary commitments even in potentially difficult social contexts. The overall high compliance rates (grand mean of 3.3) represent a notably positive finding compared to previous studies. However, this should be interpreted considering Pratiwi, Riduansyah, and Gaghauna's (2021) findings on the role of motivation in dietary compliance. The current study's high compliance rates might reflect successful motivation strategies or other supporting factors not directly measured in the study. One particularly encouraging finding is that 85.6% of respondents

regularly coordinate their meals with their insulin schedule, suggesting effective integration of dietary and medication management. This high level of coordination is crucial for optimal glycemic control, as emphasized in multiple previous studies, including Datkayeva et al.'s (2022) research on insulin timing and postprandial glycemia. These findings suggest significant progress in achieving dietary compliance among T1DM patients, though the markedly higher compliance rates compared to previous studies warrant careful consideration of potential methodological differences and other influencing factors.

Factors influencing compliance with diet therapy among patients with type 1 diabetes mellitus

The current study reveals that a substantial majority (87%) of respondents acknowledge various factors as influential in their diet therapy compliance, while only 13% consider these factors non-influential. This comprehensive analysis of influencing factors provides valuable insights when compared to previous research findings. Healthcare support emerged as a particularly significant factor, with 91.5% of respondents indicating that healthcare provider support positively influences their dietary adherence. This finding aligns with Nketia et al.'s (2022) emphasis on the importance of tailored nutritional education programs, though the current study shows a notably higher recognition of healthcare support's value. Knowledge and motivation factors show strong influence, with 85.5% of respondents acknowledging sufficient dietary knowledge and 88.2% reporting motivation from health benefits. This finding presents an interesting contrast to Pratiwi, Riduansyah, and Gaghauna's (2021) study, which also identified motivation as crucial but

found varying levels of motivational impact. The current study suggests a more consistently positive role of motivational factors. Barriers to compliance were also prominently identified. Financial constraints affect 80.7% of respondents, while limited availability of diabetes-friendly foods influences 81.3%. Social and cultural factors present significant challenges, with 90.3% reporting difficulty resisting unhealthy foods and 82.4% citing cultural food preferences as influential. These findings expand on the limitations noted in previous studies by providing specific, quantifiable insights into barriers to dietary compliance. Emotional and practical challenges were notably significant, with 87.2% of respondents identifying stress as a factor affecting dietary adherence, and 85.6% citing time constraints in meal preparation. This emotional component adds depth to Builes-Montaño et al.'s (2022) findings, which focused primarily on technical aspects of dietary management like carbohydrate counting. Family and social support emerged as crucial factors, with 87.1% acknowledging their positive influence on dietary compliance. This aligns with broader diabetes management literature but provides more specific quantification of social support's importance. The challenge of social events and peer pressure (88.3% agreement) further emphasizes the complex social dynamics involved in dietary management. The study also revealed strong beliefs in the efficacy of diet therapy, with 89.3% of respondents believing that strict adherence significantly improves health outcomes. This high level of conviction contrasts interestingly with Koutnik et al.'s (2024) case study, which focused on specific dietary approaches, suggesting that general belief in dietary management's importance exists alongside uncertainty about specific approaches. Practical aspects of diet management, such as confusion about portions (88.8% agreement) and physical activity's influence on dietary choices (85.6% agreement), emerged as

significant factors. These findings complement previous research by highlighting the interconnected nature of various aspects of diabetes management. The overall high influence rating (grand mean of 3.4) across all factors suggests that successful dietary management requires addressing multiple concurrent influences, ranging from practical and economic factors to psychological and social support aspects. This comprehensive understanding of influencing factors provides a more nuanced perspective than previous studies, which often focused on more limited sets of factors.

5.2 Implication to nurses

The findings of this study have significant implications for nurses, particularly in the management and care of patients with type 1 diabetes mellitus (T1DM). The high level of knowledge about diet therapy observed among the respondents (78%) suggests that nurses play a crucial role in educating patients on dietary management, and this knowledge is essential for optimal glycemic control. Nurses can use this information to continue reinforcing key concepts such as sugar intake reduction, portion control, and healthy food choices, areas in which patients demonstrated particularly strong understanding. Given the high confidence levels in self-management (78.6%), nurses should also focus on providing continuous support to further empower patients, ensuring they feel confident and capable of managing their diabetes effectively.

However, despite the high level of theoretical knowledge, challenges in translating this knowledge into practice remain. Nurses should be aware of the gap between knowledge and compliance, as highlighted in this study, and address this by developing individualized care plans that take into account personal, social, and cultural factors that might affect

dietary adherence. This includes identifying barriers such as financial constraints, limited availability of diabetes-friendly foods, and social influences like peer pressure and cultural food preferences. By understanding these barriers, nurses can tailor their interventions to better support patients in overcoming these challenges and improve dietary compliance.

Healthcare provider support was identified as a key factor influencing dietary adherence, with 91.5% of respondents recognizing its importance. Nurses should leverage their role as primary healthcare providers to offer ongoing education, motivation, and guidance. Additionally, the study found that family and social support significantly impacts compliance, with 87.1% of respondents acknowledging its positive influence. Nurses should encourage family involvement in diabetes care and explore ways to strengthen social support systems, which could be particularly beneficial during challenging moments, such as social gatherings or stressful periods.

The study also highlights the importance of integrating dietary management with insulin therapy, as 85.6% of respondents regularly coordinated their meals with their insulin schedule. Nurses can work closely with patients to ensure that dietary choices align with insulin administration, thereby enhancing glycemic control and reducing the risk of complications.

5.3 Summary

In this study, the knowledge, attitude, and practices regarding dietary management among individuals with type 1 diabetes mellitus (T1DM) were examined. The findings indicated a strong theoretical understanding of dietary management, with 78% of respondents demonstrating good knowledge of diet therapy. Additionally, 78.6% of respondents

expressed confidence in managing their diet effectively. However, there was a notable gap between this knowledge and actual dietary adherence, suggesting the need for further support in translating knowledge into practice.

The study identified several factors that influenced dietary adherence, including the crucial role of healthcare provider support, which was recognized by 91.5% of respondents as a key element in managing their condition. Family and social support were also important, with 87.1% of participants acknowledging their positive impact on dietary adherence. Furthermore, the study revealed that 85.6% of respondents effectively coordinated their meals with insulin therapy, demonstrating an integrated approach to managing their diabetes.

5.4 Conclusion

This study highlights the significant role of knowledge, attitude, and various factors influencing dietary compliance among individuals with type 1 diabetes mellitus (T1DM). The findings demonstrate a high level of knowledge and confidence in diet management, yet emphasize the ongoing challenges of translating this knowledge into consistent practice. Healthcare provider support, family and social involvement, and effective coordination between diet and insulin therapy were identified as crucial elements that enhance dietary adherence. Despite these positive outcomes, barriers such as financial constraints, time limitations, and social pressures continue to affect compliance.

For nurses, this underscores the importance of not only educating patients about diabetes management but also addressing the multifaceted barriers to dietary adherence. Tailored educational programs, ongoing support, and a holistic approach that includes social and

emotional aspects of care are essential for improving patient outcomes. Ultimately, the integration of knowledge, motivation, and practical support can foster better self-management practices, leading to improved long-term health for individuals with type 1 diabetes.

5.5 Limitations of study

The limitations of this study include several factors that may impact the generalizability and accuracy of the findings. Firstly, the study's cross-sectional design limits the ability to establish causal relationships between variables, such as the connection between knowledge and dietary compliance. Secondly, the sample size, although adequate for the study, may not fully represent the broader population of individuals with type 1 diabetes, especially considering regional or cultural differences that may influence dietary practices and healthcare access.

Additionally, self-reported data, which was used to assess knowledge, attitude, and compliance, can introduce bias, as participants may overestimate their adherence to dietary recommendations or their understanding of diet therapy. The study also did not account for potential confounding factors, such as comorbid conditions or variations in healthcare access that could affect dietary practices.

5.6 Recommendations:

Based on the findings and limitations of the study, the following recommendations are proposed:

- Given that healthcare support was identified as a significant factor influencing diet therapy compliance, healthcare providers should continue to offer tailored nutritional education and individualized support to patients with type 1 diabetes. This could include regular follow-up consultations, clear dietary guidance, and addressing specific patient concerns related to meal planning and insulin management.
- Educational programs aimed at improving the knowledge of diet therapy for diabetes should be further emphasized, not only in clinical settings but also in community outreach programs. These programs should focus on improving knowledge in areas such as carbohydrate counting, glycemic index differentiation, and portion control, which were identified as crucial for effective diabetes management.
- Given the significant impact of financial constraints and the availability of diabetes-friendly foods on dietary compliance, initiatives aimed at reducing the cost of healthy food options for diabetes patients should be explored. This could include partnerships with local food suppliers, subsidies, or nutrition-focused community programs.
- Healthcare providers should be aware of the cultural influences on dietary choices and offer culturally appropriate advice that accommodates patients' food preferences and traditions. This approach can improve patient adherence to dietary recommendations by integrating familiar foods into their meal plans.
- Given the emotional and psychological factors, such as stress and social pressures, identified as significant barriers to dietary compliance, the inclusion of mental health

support in diabetes care is essential. This could involve counseling services, stress management techniques, and peer support groups to help patients manage the emotional challenges associated with diet adherence.

- Future studies should explore the long-term effects of diet therapy education on diabetes management, including the integration of psychological and social support mechanisms. Additionally, research should focus on investigating the impact of different interventions, including technology-driven solutions (e.g., apps for meal tracking or dietary reminders), on improving compliance and patient outcomes.
- Encouraging family involvement in the dietary management of individuals with type 1 diabetes is essential, as family support was found to play a significant role in improving compliance. Family education sessions could be organized to ensure that family members understand the importance of diet therapy and are able to provide appropriate support.

5.7 Suggestion for Further study

Based on the findings and limitations of the current study, the following suggestions for further research are proposed:

- There is an increasing use of digital health tools such as mobile applications and wearable devices to support diabetes management. Research should explore the effectiveness of these technologies in enhancing dietary compliance and improving diabetes outcomes. For instance, studies could investigate whether apps that provide meal tracking, nutritional advice, or reminders can lead to better adherence to dietary guidelines.

- Further studies could compare various dietary approaches, such as the Mediterranean diet, low-carb diet, and plant-based diets, on the management of type 1 diabetes. Such studies could help identify the most effective dietary strategies for improving blood glucose levels and minimizing complications related to the condition.

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APPENDICES

Appendix I: QUESTIONNAIRE

DEPARTMENT OF NURSING SCIENCES

SCHOOL OF BASIC MEDICAL SCIENCES

UNIVERSITY OF BENIN,

BENIN CITY, EDO

Dear Respondent,

I am a 500level student of the department of Nursing in the above-named institution. I am carrying out a research study on the topic; "**ASSESSMENT OF COMPLIANCE TO DIET-THERAPY AMONG PATIENTS WITH DIABETES MELLITUS TYPE 1 IN TERTIARY HEALTH INSTITUTION**". Please kindly assist me by indicating your opinion where necessary

Yours faithfully,

Instruction: please do not write your name, provide/tick the appropriate answer.

SECTION A: Socio demographic factors;

1. Age: 4 – 10 [ ] 11 – 17 [ ] 18 – 24 [ ] 25 – 31 [ ] 32 – 37 [ ]
1. Gender: Male[ ] Female [ ]
2. Ethnicity: Edo [ ] Hausa [ ] Igbo [ ] Yoruba [ ] others, specify ____
3. Highest level of education: primary [ ] secondary [ ] tertiary] postgraduate [ ] not educated [ ]
4. Marital status: Married [ ] single [ ] divorced [ ] widowed [ ]
5. Religion: Christianity [ ] Islamic[ ] Traditional [ ] others ..specify
6. Occupation: Civil servant [] Trader [ ] Business[ ]

Section B: Knowledge of diet therapy

S/N	Items	Strongly agree	Agree	Disagree	Strongly disagree
1.	I understand the concept of carbohydrate counting and how it impacts blood sugar levels.				
2.	I am aware of the recommended daily carbohydrate intake for individuals with type 1 diabetes.				
3.	I know how my diet affects my insulin requirements.				
4.	I can adjust my diet based on my insulin dose.				
5.	I am knowledgeable about which foods are considered healthy for managing my blood sugar levels.				
6.	I know the difference between low and high glycemic index foods.				
7.	I understand the importance of meal timing in managing blood sugar levels.				
8.	I know how to time my meals in relation to my insulin injections.				
9.	I understand how portion control can help manage my blood sugar levels.				
10.	I am aware of how the size of my meals affects my blood sugar.				
11.	I know which foods should be limited or avoided to maintain healthy blood sugar levels.				
12.	I am aware of the importance of reducing sugar intake to control my diabetes.				
13.	I feel well-informed about diet therapy through the diabetes education programs available to me.				
14.	The information provided by healthcare providers has increased my understanding of diet therapy for diabetes management.				
15.	I feel confident in managing my diet to control my diabetes.				

Section C: Compliance with diet therapy

S/N	Items	Always	sometimes	rarely	Never
16.	I follow my recommended meal plan for managing my blood sugar levels.				
17.	I eat balanced meals that include carbohydrates like rice, proteins like meat , legumes, and fish, and healthy fats from foods like avocados, nuts, and olive oil.				
18.	I monitor my carbohydrate intake as advised by my healthcare provider.				
19.	I avoid sugary foods and beverages to control my blood sugar.				
20.	I consume high-fiber foods such as vegetables, whole grains, and legumes.				
21.	I eat at regular meal times without skipping meals.				
22.	I choose healthy snacks such as nuts, yogurt, or fruits instead of processed snacks.				
23.	I measure portion sizes to prevent overeating or under-eating.				
24.	I follow dietary recommendations when eating out or attending social gatherings.				
25.	I drink plenty of water instead of sugary drinks or sodas.				
26.	I reduce my intake of fried and high-fat foods as recommended.				
27.	I seek guidance from a dietitian or healthcare professional when unsure about my diet.				
28.	I prepare home-cooked meals that align with my diet plan.				
29.	I read food labels to check for sugar content before consuming packaged foods.				
30.	I take my meals in accordance with my insulin schedule.				

Section D: Factors influencing compliance with diet therapy

S/N	Items	Strongly agree	Agree	Disagree	Strongly disagree
31.	I have enough knowledge about diet therapy to follow my recommended meal plan.				
32.	The cost of healthy food options affects my ability to comply with diet therapy.				
33.	Limited availability of diabetes-friendly foods influences my diet choices.				
34.	Family and social support encourage me to follow my dietary recommendations.				
35.	Lack of time to prepare healthy meals affects my compliance with diet therapy.				
36.	I find it difficult to resist unhealthy foods, even though I know they affect my blood sugar levels.				
37.	Cultural food preferences make it hard for me to strictly follow my diet plan.				
38.	Healthcare professionals provide adequate guidance on how to manage my diet effectively.				
39.	I feel motivated to comply with diet therapy because of the health benefits.				
40.	Stress and emotional factors make it difficult for me to maintain a healthy diet.				
41.	The support of my healthcare provider positively influences my adherence to diet therapy.				
42.	Confusion about food portions and meal planning affects my compliance with diet therapy.				
43.	I believe strict adherence to diet therapy significantly improves my health outcomes.				
44.	Peer pressure and social events make it challenging to stick to my diet plan.				
45.	My level of physical activity influences my dietary choices.				

Appendix II: INFORMED CONSENT FORM

TITLE OF STUDY: Assessment of compliance to diet- therapy among patients with Diabetes Mellitus Type 1 in a tertiary health institution in Benin city.

INSTITUTION: Department of Nursing Science, University of Benin, Edo State.

PRINCIPAL INVESTIGATOR: Chigbo Rosemary Onyinye

PARTICIPATION: Participation in this study is voluntary. Refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may discontinue your participation at any time without penalty or loss of benefits. The principal investigator may decide to withdraw you from the study if we are unable to obtain the necessary information.

INTRODUCTION: I'm interested in examining the compliance to diet-therapy among patients with Diabetes Mellitus Type I in the Consultant Out-Patient Department (COPD) of University of Benin Teaching Hospital (UBTH), Edo State. I will only ask questions on compliance with diet- therapy, Knowledge of diet- therapy and factors influencing compliance with diet-therapy.

PROCEDURES TO BE FOLLOWED

QUESTIONNAIRE: If you agree to participate, I will ask you questions about your socio-demographic data, Knowledge, attitude and the practice of diet-therapy.

BENEFITS: You will be enlightened on the benefits proper compliance with diet- therapy.

COMPENSATION: There is no compensation to volunteers for their participation.

DURATION OF PARTICIPATION: This study only requires the questionnaire. There is no follow-up or further information needed.

WHO CAN PARTICIPATE IN THIS STUDY: the study focus on patients with diabetes mellitus type 1 attending the consultant out-patient department (COPD) of University of

Benin Teaching Hospital located at Egor local government area in Benin city, Edo state, Nigeria.

ASSURANCE OF CONFIDENTIALITY OF VOLUNTEER'S IDENTITY: Records relating to your participation in the study will remain confidential. Your name will not be used in any report resulting this study. All questionnaires, computerized records, and analysis of data will contain only a unique study number, not your name.

PERSONS AND PLACES FOR ANSWERS REGARDING YOUR RIGHTS AS A RESEARCH SUBJECT: If during the course of this study you have questions concerning the nature of the research or you believe you have sustained a research-related injury or assault, you should contact;

Chigbo Rosemary Onyinye

Department of Nursing, University of Benin,

Benin city, Edo State ,Nigeria.

Phone number: 08101552602

Email: rosemaryonyinyechukwu2019@gmail.com

Ethics and Research Committee,

Phone number:

Email: ubthresearchethics@gmail.com

IF THERE IS ANY PORTION OF THIS CONSENT AGREEMENT THAT YOU DO NOT UNDERSTAND, ASK THE FIELD WORKER OR INVESTIGATOR BEFORE SIGNING.

Please, sign below if you have agreed to participate in the study.

Appendix III: CERTIFICATION OF CONSENT

I, ……. having full capacity to consent for myself do thereby to my participation in the research study.

The methods and means by which the study will be conducted and the risks which may be reasonably expected have been explained to me by the researcher. I have been given the opportunity to ask question concerning this investigational study, and any such questions have been answered to my full and complete satisfaction.

I understand that I may at any time during the course of this study revoke this consent and withdraw myself from the study without prejudice.

Subject's Signature: _____ Date:

CERTIFICATION OF CONSENT

THE PARENTS/GUARDIAN

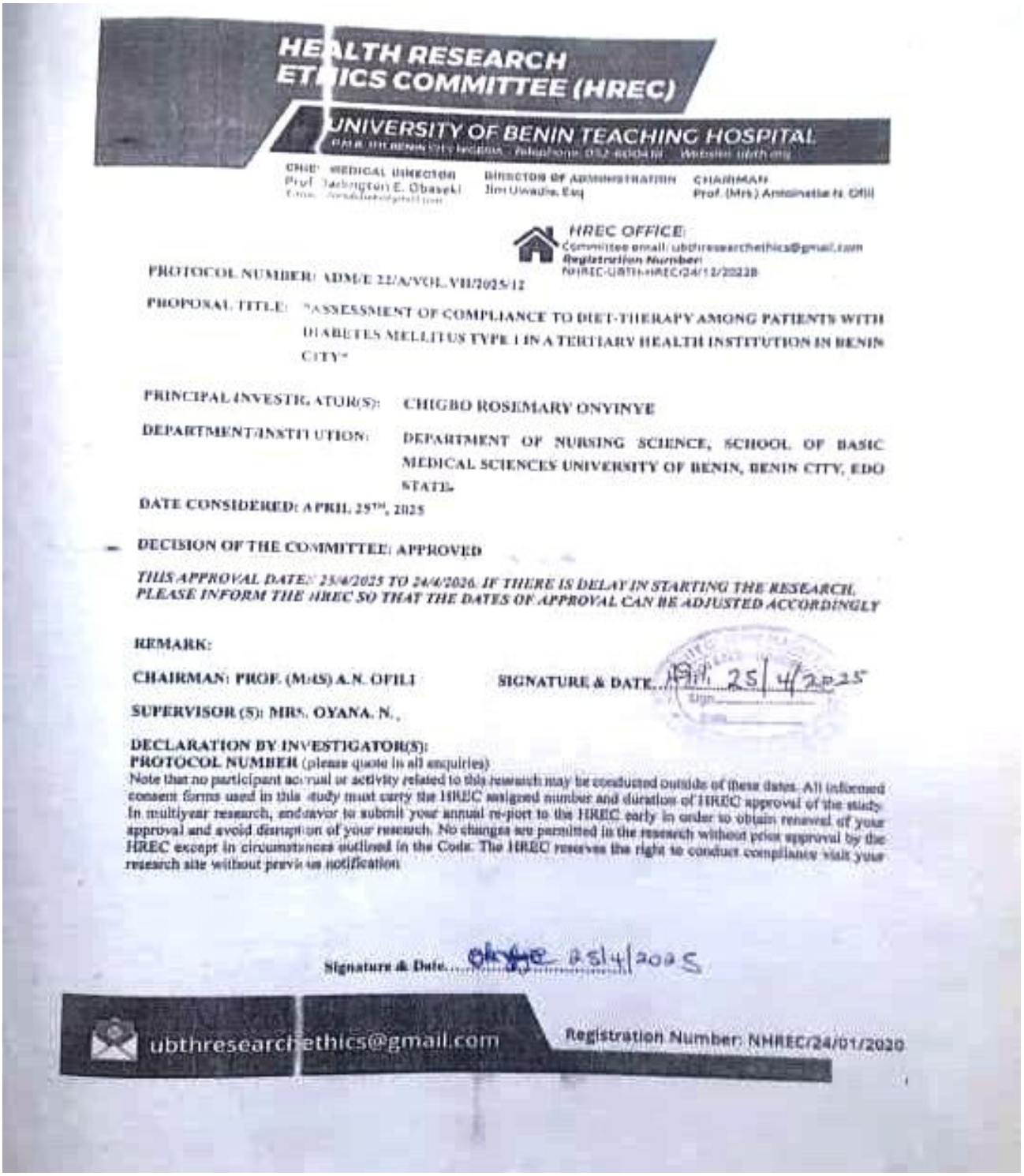
I, ……. having full capacity to consent for my ward to do thereby participate the research study.

The methods and means by which the study will be conducted and the risks which may be reasonably expected have been explained to me by the researcher. I have been given the opportunity to ask question concerning this investigational study, and any such questions have been answered to my full and complete satisfaction.

I understand that I may at any time during the course of this study revoke this consent and withdraw my ward from the study without prejudice.

Parents /guardian's Signature: _____ Date:

Appendix IV: ETHICAL APPROVAL



HEALTH RESEARCH ETHICS COMMITTEE (HREC)

UNIVERSITY OF BENIN TEACHING HOSPITAL

PMB 1111, BENIN CITY, NIGERIA. Telephone: 052-600418 Website: ubth.org

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HREC OFFICE:
Committee email: ubthresearchethics@gmail.com
Registration Number:
NHREC/UBTH-HREC/24/12/2022B

PROTOCOL NUMBER: ADM/E 22/A/VOL.VII/2025/12

PROPOSAL TITLE: "ASSESSMENT OF COMPLIANCE TO DIET-THERAPY AMONG PATIENTS WITH DIABETES MELLITUS TYPE 1 IN A TERTIARY HEALTH INSTITUTION IN BENIN CITY"

PRINCIPAL INVESTIGATOR(S): CHIGBO ROSEMARY ONYINYE

DEPARTMENT/INSTITUTION: DEPARTMENT OF NURSING SCIENCE, SCHOOL OF BASIC MEDICAL SCIENCES UNIVERSITY OF BENIN, BENIN CITY, EDO STATE.

DATE CONSIDERED: APRIL 25TH, 2025

DECISION OF THE COMMITTEE: APPROVED

THIS APPROVAL DATE: 25/4/2025 TO 24/4/2026. IF THERE IS DELAY IN STARTING THE RESEARCH, PLEASE INFORM THE HREC SO THAT THE DATES OF APPROVAL CAN BE ADJUSTED ACCORDINGLY

REMARK:

CHAIRMAN: PROF. (MRS) A.N. OFILI SIGNATURE & DATE: 25/4/2025

SUPERVISOR (S): MRS. OYANA. N.,

DECLARATION BY INVESTIGATOR(S):
PROTOCOL NUMBER (please quote in all enquiries)
Note that no participant accrual or activity related to this research may be conducted outside of these dates. All informed consent forms used in this study must carry the HREC assigned number and duration of HREC approval of the study. In multiyear research, endeavor to submit your annual report to the HREC early in order to obtain renewal of your approval and avoid disruption of your research. No changes are permitted in the research without prior approval by the HREC except in circumstances outlined in the Code. The HREC reserves the right to conduct compliance visit your research site without previous notification

Signature & Date: 25/4/2025

ubthresearchethics@gmail.com Registration Number: NHREC/24/01/2020