NUTRITIONAL KNOWLEDGE AND DIETARY HABITS AMONG DIABETIC PATIENTS IN A TERTIARY HEALTH INSTITUTION IN EDO STATE

BY

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IN PARTIAL FULFILMENT OF THE AWARD OF THE DEGREE OF BACHELOR OF NURSING SCIENCE, FACULTY OF NURSING SCIENCES, UNIVERSITY OF BENIN, BENIN CITY

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CERTIFICATION PAGE

This is to certify that this project was carried out by **OJO SNOWHITE ENIBOKUN** with matriculation number **BMS2005003**, Faculty of Nursing Sciences, University of Benin, Benin City.

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(External Examiner) **Sign & Date**

DEDICATION

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

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With profound gratitude, I acknowledge the Almighty God, the ultimate source of my strength, wisdom, and unwavering perseverance, whose divine grace has been my steadfast anchor throughout this enriching academic voyage. I commend myself for remaining resilient, dedicated, and focused amidst every challenge, embracing growth even when the path ahead seemed uncertain.

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ABSTRACT

This study investigated nutritional knowledge and dietary habits among diabetic patients in a tertiary health institution, Edo State. The study aims to ascertain level of nutritional knowledge of diabetes among patients with diabetes, dietary habits of patients with diabetes and the factors influencing food consumption pattern of patients with diabetes attending a tertiary institution, Benin City. Three research questions were raised and answered in the study and stated hypothesis was tested at <0.05 level of significance. The study adopted a non-experimental descriptive survey design. The study population was 440 Diabetic patients attending treatment at University of Benin teaching hospital, from which a sample size of 230 respondents were selected for the study using convenient sampling method. A well-structured questionnaire instrument was drafted and used for data collection. The instrument was validated by the research supervisor and two other experts in the field. To ensure the reliability of the instrument, a pilot study was conducted and a reliability value greater than (>0.5) was obtained. The data collected were analysed using both descriptive and inferential statistics such as frequency count, percentages, means, Anova and graphical representation of results.The result shows that majority of the respondents have fair nutritional knowledge of diabetes. Also, majority of the respondents have poor dietary habits. Furthermore, taste preferences, emotional state, food prices, availability of healthy option are factors influencing food consumption pattern. Based on the findings, it was concluded and recommended that there should be health education by nurses to enlighten people on the importance of good dietary changes to health and mass media outlets such as television, radio, road jingles and posters etc. should be used to disseminate useful information on the importance of nutritional knowledge of diabetes.

Keywords: *Diabetes, Diabetic Patients,* Dietary Habits, *Knowledge, Perception.*

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

In today's world, nutrition-related non-communicable diseases continue to impose a significant global health burden, affecting millions of people and straining healthcare systems (Onyango & Onyango, 2021). Among these conditions, diabetes stands out as one of the most prevalent and consequential chronic nutrition-related diseases, impacting over 500 million individuals worldwide, which corresponds to approximately 6.3% of the global population (Khan et al., 2020). Recognized as the ninth leading cause of death globally, diabetes is responsible for a considerable mortality rate, with over 1.5 million deaths directly attributed to the disease annually (WHO, 2021). Alarmingly, more than one-third of these diabetes-related deaths occur in individuals under the age of 60, highlighting the growing public health concern of early-onset diabetes. The International Diabetes Federation (IDF) recently reported that in the Middle East and North Africa (MENA) region, diabetes prevalence in Saudi Arabia alone reached 18%, indicating a troubling trend in this population (IDF, 2022).

Research consistently demonstrates a sustained upward trend in the prevalence of diabetes across diverse populations, accompanied by a marked increase in the burden of disability-adjusted life years (DALYs), reflecting both human suffering and loss of productivity (Khan et al., 2020; Bukhman et al., 2020). Contributing to this trend are both non-modifiable and modifiable risk factors. Non-modifiable determinants, including advancing age and a family history of diabetes, play a substantial role in predisposing individuals to the condition (Ghazvineh & Javvaji, 2020). At the same time, modifiable risk factors, such as an elevated body mass index (BMI) arising from the consumption of high-calorie, nutrient-poor diets and physical inactivity, are particularly

associated with the development of type 2 diabetes mellitus (T2DM) (Ghazvineh & Javvaji, 2020).

Recent analyses emphasize that pharmacological interventions alone are insufficient for the effective management of diabetes (Khan et al., 2020). Successful management requires a multifactorial approach that considers demographic and social determinants influencing patient outcomes, as well as patient-related factors such as self-care behaviors that are critical for glycaemic control (Gillani et al., 2019). Self-care behaviors encompass regular blood glucose monitoring, adherence to dietary recommendations, and the acquisition of diabetes-specific knowledge, all of which significantly impact long-term disease management (Gillani et al., 2019). Dietary monitoring, in particular, is a crucial aspect of diabetes care, as it allows for the assessment of patients' nutritional status, quality of life, and risk of complications, thereby guiding interventions to prevent chronic disease sequelae (Gillani et al., 2019).

Type 2 diabetes that manifests before the age of 45 is often linked to obesity, dyslipidemia, smoking, and sedentary lifestyles, which collectively contribute to early disease onset (Bo et al., 2019). Fortunately, evidence suggests that even simple lifestyle modifications can play a substantial role in preventing or delaying the development of diabetes-related complications (WHO, 2021). Central to these interventions are dietary adjustments and nutrition education, which form the cornerstone of T2DM management (Breen et al., 2021). Proper dietary knowledge not only supports glycaemic control but also empowers patients to make informed food choices that enhance their overall quality of life (Taylor et al., 2019).

Despite the proven benefits of dietary education, patients with T2DM frequently encounter challenges in identifying appropriate dietary plans, including the recommended types, quantities,

and timing of foods. Their food choices and eating behaviors are heavily influenced by their level of knowledge regarding diabetes-specific nutrition (Sami et al., 2020). For instance, a study conducted in the Almajamah area of Saudi Arabia revealed poor awareness, attitudes, and practices related to healthy dietary habits among T2DM patients, with only one-sixth adhering to a strict diabetic diet, indicating suboptimal disease control (Ansari et al., 2019). Non-adherence to prescribed dietary regimens, coupled with inadequate knowledge, is prevalent in many countries and is further compounded by insufficient family support and low levels of personal motivation (McBrien et al., 2019). Notably, early-onset diabetes (<60 years) is more common in low- and middle-income countries, whereas in high-income regions, T2DM is predominantly observed among older adults (>60 years) (Ansari et al., 2019).

Understanding the level of dietary knowledge and awareness among diabetic patients is a fundamental step toward designing effective disease prevention and management programs. Despite the increasing prevalence of T2DM globally, research indicates that patients often possess inadequate knowledge regarding proper nutrition and dietary habits (Ansari et al., 2019). Assessing patients' knowledge and perceptions of dietary management enables healthcare providers to deliver more targeted and effective educational interventions, thereby enhancing disease outcomes. Accordingly, this study aims to evaluate the nutritional knowledge and dietary behaviors of patients with diabetes attending a tertiary healthcare institution in Benin City, with the objective of informing strategies to improve dietary adherence, glycaemic control, and overall quality of life.

1.2 Statement of the Problem

The prevalence of diabetes mellitus (DM) among adults worldwide has been steadily increasing over the past few decades, reflecting a growing public health concern. Globally, the proportion

of adults aged 18 years and above living with diabetes rose from 4.7% in 1980 to 8.5% in 2014, with the most rapid increases observed in low- and middle-income countries (Sawar et al., 2020). In Africa, an estimated 12.1 million individuals were living with diabetes in 2010, a figure projected to nearly double to 23.9 million by 2030 (Wild et al., 2021). Within Nigeria, prevalence rates vary across regions, yet national estimates suggest that 6.8% of adults aged over 40 years are affected (WHO, 2019). Diabetes mellitus contributes substantially to morbidity and mortality, largely due to its chronic complications affecting multiple organ systems. These complications include cardiovascular disorders, renal failure, visual impairment and blindness, diabetic ketoacidosis, hypoglycemia, and increased susceptibility to infections (Chawla et al., 2021). The disease promotes structural and functional changes in the microvasculature, compounded by oxidative stress, low-grade inflammation, accumulation of advanced glycation end products, and neovascularization of vasa vasorum, all of which contribute to vascular complications (Chawla et al., 2021).

If risk factors such as hyperglycemia, hypertension, and dyslipidemia are not well managed, individuals are highly susceptible to diabetic peripheral neuropathy, nephropathy, and other microvascular complications. In fact, neuropathy has been reported in up to 33.5% of diabetic patients (Won et al., 2022). Additionally, patients with insulin-dependent diabetes face an increased risk of atherosclerosis, stroke, heart diseases, retinopathy, peripheral nerve damage, and renal impairment compared to the general population (CDC, 2021). According to the World Health Organization, diabetes is projected to become the seventh leading cause of death globally by 2030 (WHO, 2020). The economic burden in developing countries, including Nigeria, is substantial, encompassing direct medical costs for intensive blood glucose monitoring, management of cardiovascular, renal, and neurological complications, as well as long-term care

requirements (Zimmet, 2021). Furthermore, diabetes significantly diminishes quality of life and reduces life expectancy, imposing additional physical, social, and emotional challenges on patients (Zhang et al., 2020).

Effective management of diabetes requires adequate knowledge about the disease, particularly regarding nutrition and dietary practices. Nutrition knowledge equips individuals with type 2 diabetes (T2DM) to make informed food choices that support metabolic self-management, improve glycemic control, and enhance overall quality of life. Improved patient knowledge about diabetes and its complications has been shown to positively influence adherence to treatment protocols and reduce the risk of complications (Murugesan et al., 2019). However, evidence indicates that many patients with diabetes have significant deficits in nutrition-related knowledge and practical skills necessary for dietary management. Studies in Nigeria demonstrate low adherence to recommended macronutrient intake, insufficient consumption of fruits and vegetables, and poor dietary practices, all of which hinder effective glycemic control and increase the risk of metabolic complications (Nyenwe et al., 2020).

Even within teaching hospitals that provide specialized care, studies have revealed that a significant proportion of patients display inadequate knowledge, attitudes, and practices regarding diet. For instance, research in India and Umuahia, Nigeria, found that 88% of diabetic patients had poor understanding of dietary requirements and a considerable number were obese (Jeon & Murray, 2021). Although a few studies have explored the nutritional knowledge and dietary patterns of diabetics, most are outdated, and recent evidence remains limited. A study conducted at the Federal Medical Centre in Owo assessed dietary habits and nutritional status among patients with diabetes (Oladapo et al., 2023), yet there is a notable gap regarding detailed information on nutritional knowledge, dietary habits, and overall nutritional status among

diabetic patients attending teaching hospitals in Benin City. Given the rising prevalence of diabetes and its profound implications on health and quality of life, assessing the nutritional knowledge and dietary practices of diabetic patients is crucial. Such research is essential for developing targeted interventions that improve dietary compliance, optimize metabolic outcomes, and enhance the long-term management of diabetes. Therefore, this study aims to evaluate the nutritional knowledge and dietary habits of patients with diabetes attending a tertiary institution in Benin City.

1.3 Objectives of the Study

The main objective of the study is to assess the nutritional knowledge and dietary habits of patients with diabetes attending a tertiary institution, Benin City.

The specific objectives of the study are to:

1. ascertain the level of nutritional knowledge of diabetes among patients with diabetes attending a tertiary institution, Benin City.
2. identify the dietary habits of patients with diabetes attending a tertiary institution, Benin City.
3. determine the factors influencing food consumption pattern of patients with diabetes attending a tertiary institution, Benin City.

1.4 Research Questions

These questions are stated from the research problem and will serve as a guide for this study, they include:

1. What is the level of knowledge of nutrition and diabetes among patients with diabetes attending a tertiary institution, Benin City.

2. What are the dietary habits of patients with diabetes attending a tertiary institution, Benin City.
3. What are the factors influencing food consumption pattern of patients with diabetes attending a tertiary institution, Benin City.

1.5 Hypothesis

There is no significant difference between the knowledge and dietary habits of patients with diabetes attending a tertiary institution, Benin City.

1.6 Significance of the Study

The relevance of this study cuts across areas of Nursing practice, Nursing Education and the society. Nursing is a profession that focuses on care of individuals, families and communities to maintain optimum health and help patients to attain wellness through health education.

Nurses are always in contact with their patients providing holistic care. With the good communication skills of a nurse, patient-nurse relationship is established and the ability to develop trust. A nurse as an educator or a teacher is an important and primary role. Through teaching and counseling, the nurse assess their level of knowledge and their perception, she educates these patients on diabetes and ways in which it can be managed. These patients with diabetes have the right to health education in order to make informed decisions. The nurse is in the position to influence healthy lifestyles, through the application of this knowledge. During counseling, she interacts with patients to identify what type of drugs they are on, those factors that might serve as a barrier to their adherence and motivate these patients to make adherence to their therapeutic regimen achievable. People often make informed decisions on their health, when they are fully aware of the health benefits. This study will increase the knowledge of diabetes and its management among members of the society, and steer their interest, thereby

enabling them to increase their responsibility for personal health. The trend towards health promotion will create opportunity for nurses to strengthen the profession's influence on health promotion through nursing education, promotes an educated public, and assist individuals and communities to change long-lasting behaviors.

1.7 Scope of the Study

The study focuses nutritional knowledge and dietary habits of patients with diabetes attending a tertiary institution, Benin City.

1.8 Operational Definition of Terms

Diabetes: In this study, it refers to a blood sugar reading of 126mg/dl or higher over a number of weeks to a number of years.

Knowledge: This refers to the level of understanding of patients with diabetes about diabetes.

Diabetic patient: In this study, it refers to patients with diabetes whose blood sugar readings are consistently 126mg/dl or higher over a number of weeks to a number of years.

Perception: the way in which diabetes is regarded, understood or interpreted.

CHAPTER TWO

LITERATURE REVIEW

This section examined related literature with focus on the conceptual, empirical review and theoretical framework.

2.1 Conceptual review

2.1.1 Concept of Diabetes Mellitus

Diabetes mellitus (DM) is a chronic metabolic disorder marked by persistent hyperglycemia resulting from defects in insulin secretion, impaired insulin action at peripheral tissues, or a combination of both. According to the International Diabetes Federation (IDF), approximately 415 million adults aged 20 to 79 years were living with diabetes worldwide in 2015, a figure projected to rise by an additional 200 million by 2040 if current trends persist (Zheng et al., 2021). The condition poses a significant global public health challenge, as chronic hyperglycemia, together with other metabolic abnormalities, can cause extensive damage to multiple organ systems. The resulting complications include both microvascular manifestations—such as retinopathy, nephropathy, and neuropathy—and macrovascular outcomes, which substantially elevate the risk of cardiovascular diseases, often two- to fourfold higher than in non-diabetic populations. This review provides a comprehensive overview of the pathophysiology, diagnosis, clinical features, and management principles of diabetes mellitus.

Etiology and Classification

Diabetes is classified into several types based on etiology and clinical presentation, the most common being type 1 diabetes mellitus (T1DM), type 2 diabetes mellitus (T2DM), and gestational diabetes mellitus (GDM). Less prevalent forms include monogenic diabetes and secondary diabetes (Malek et al., 2019).

Type 1 Diabetes Mellitus (T1DM)

T1DM accounts for approximately 5–10% of all diabetes cases and is primarily characterized by autoimmune destruction of pancreatic beta cells, resulting in absolute insulin deficiency. Both genetic predisposition and environmental triggers, including viral infections, toxins, and certain dietary factors, have been implicated in the development of autoimmunity. T1DM typically manifests during childhood or adolescence but can occur at any age. A variant, latent autoimmune diabetes in adults (LADA), develops more gradually in adulthood. Patients are often lean and may also develop other autoimmune disorders such as Addison disease, Hashimoto thyroiditis, or celiac disease. Autoantibodies against islet cells, insulin, glutamic acid decarboxylase-65 (GAD-65), and zinc transporter 8 (ZnT8) may be present early in the disease but wane over time, reducing their diagnostic accuracy after the first year.

Type 2 Diabetes Mellitus (T2DM)

T2DM accounts for approximately 90% of all diabetes cases. It is primarily characterized by insulin resistance, where peripheral tissues fail to respond adequately to insulin. Initially, pancreatic beta cells compensate by increasing insulin secretion, but over time, this compensatory mechanism fails, resulting in persistent hyperglycemia. T2DM traditionally affects individuals over 45 years of age; however, its incidence in children, adolescents, and young adults is rising due to increasing obesity rates, sedentary lifestyles, and consumption of high-energy diets. Risk factors include abdominal obesity, prior gestational diabetes, hypertension, dyslipidemia, and physical inactivity. Adipose tissue contributes to insulin resistance through inflammatory pathways, free fatty acid release, and dysregulated adipokines. Emerging research also highlights the role of gut microbiota, altered incretin biology, and hyperglucagonemia in the pathogenesis of T2DM.

Gestational Diabetes Mellitus (GDM)

GDM refers to hyperglycemia first detected during pregnancy, most commonly occurring in the second or third trimester. It affects approximately 7% of pregnancies globally, according to the American Diabetes Association (ADA). Women with GDM and their offspring are at increased risk for developing T2DM later in life. Maternal complications include hypertension, preeclampsia, and polyhydramnios, while fetal consequences may include macrosomia, congenital anomalies, and respiratory distress syndrome. Risk factors include advanced maternal age, obesity, excessive gestational weight gain, a history of stillbirth, or a family history of diabetes.

Monogenic and Secondary Diabetes

Monogenic diabetes arises from single-gene mutations affecting insulin secretion and accounts for 1–5% of diabetes cases, including neonatal diabetes and maturity-onset diabetes of the young (MODY). Secondary diabetes develops due to underlying conditions affecting the pancreas (e.g., pancreatitis), hormonal disorders (e.g., Cushing disease), or drug-induced hyperglycemia (e.g., corticosteroids).

Epidemiology

Globally, diabetes has reached epidemic proportions, driven by sedentary lifestyles, poor dietary habits, and increasing obesity. By 2017, 425 million people worldwide were estimated to have diabetes. In the United States, approximately 10% of the population had diabetes in 2015, with seven million cases undiagnosed. The prevalence of DM increases with age, affecting roughly one-quarter of individuals over 65 years (Carrillo-Larco et al., 2019).

Pathophysiology

T1DM results from autoimmune-mediated destruction of pancreatic beta cells, with a strong genetic link through human leukocyte antigens (HLA), particularly DR3-DQ2 and DR4-DQ8. Idiopathic T1DM, more prevalent in African and Asian populations, may present with episodic diabetic ketoacidosis (DKA) and lacks detectable autoantibodies. In T2DM, chronic insulin resistance is accompanied by progressive beta-cell dysfunction. Obesity, especially visceral fat, exacerbates insulin resistance through inflammatory mechanisms and free fatty acid release, while lack of physical activity further increases susceptibility.

Clinical Presentation and Evaluation

Patients with diabetes frequently present with polyuria, polydipsia, fatigue, recurrent infections, delayed wound healing, numbness or tingling in extremities, and visual disturbances. Acute presentations may include severe hyperglycemia or DKA, particularly in T1DM. Physical examination should assess height, weight, BMI, retinal health, peripheral pulses, and neuropathy.

Screening and Diagnosis

Screening is recommended for individuals over 40 years or earlier for high-risk groups, including those with obesity, family history, polycystic ovary syndrome, hypertension, low HDL cholesterol, or certain ethnic backgrounds (Hussain & Chowdhury, 2019). Diagnostic criteria include fasting plasma glucose ≥126 mg/dL, 2-hour oral glucose tolerance test (OGTT) ≥200 mg/dL, or HbA1C ≥6.5%. Pregnant women are screened for GDM at 24–28 weeks using either one-step (75 g OGTT) or two-step (50 g challenge followed by 100 g OGTT) approaches.

Management

The foundation of DM management is lifestyle modification, emphasizing diet and exercise. Patients are encouraged to follow diets low in saturated fat and refined carbohydrates but high in fiber and monounsaturated fats. Aerobic exercise for 90–150 minutes per week is recommended, with weight loss prioritized for obese T2DM patients. Pharmacologic therapy typically begins with metformin, with additional options including sulfonylureas, DPP-4 inhibitors, GLP-1 receptor agonists, SGLT2 inhibitors, pioglitazone, and insulin as needed. For T1DM, basal-bolus insulin therapy or insulin pump therapy remains the mainstay. Target HbA1C is <7%, with BP <130/85 mmHg, and LDL-C <100 mg/dL (or <70 mg/dL in patients with atherosclerotic cardiovascular disease).

Complications and Patient Education

Persistent hyperglycemia leads to both acute (hypoglycemia, DKA, hyperosmolar states) and chronic complications (microvascular: nephropathy, neuropathy, retinopathy; macrovascular: coronary artery disease, peripheral artery disease, cerebrovascular disease). Patient education on self-monitoring of blood glucose, lifestyle modification, foot care, smoking cessation, and regular ophthalmologic assessments is essential to prevent complications. Multidisciplinary care, including endocrinologists, cardiologists, nephrologists, and diabetes educators, is critical to improving outcomes and reducing morbidity and mortality associated with diabetes (Su et al., 2019).

2.1.2 Concept of Knowledge and Perception

The concept of knowledge has been defined in multiple ways, and several theoretical frameworks have been proposed to explain its nature, acquisition, and application. Abdullah and

Leung (2011) defined knowledge as a theoretical or practical understanding of a subject, emphasizing that it involves both cognitive comprehension and practical proficiency.

Philosophical traditions such as empiricism further refine this perspective by conceptualizing knowledge as awareness or familiarity gained primarily through experience (Armstrong, 2013). Empiricists argue that genuine knowledge can only arise from direct experience, observation, or interaction with the world. This suggests that without personal experience, claims of knowledge may be incomplete or even invalid. Applying this to an academic context, adopting the empiricist stance implies that students can only claim to truly understand a subject if they have engaged with it practically. For instance, students studying the theoretical dimensions of juvenile diabetes without clinical exposure would, under the empiricist framework, lack true knowledge of the disease. Indeed, the broader educational system often implicitly supports this viewpoint: internships, practical placements, and hands-on laboratory experiences are typically emphasized as crucial for learning, reflecting the high value placed on experience-based knowledge relative to purely theoretical instruction.

However, the empiricist definition has notable limitations. By equating knowledge solely with experience, it fails to distinguish between true understanding and mistaken beliefs. Knowledge gained through flawed or incomplete experiences may mislead learners, and thus, experience alone is not sufficient to establish true knowledge. Alternative epistemological perspectives assert that knowledge can also be attained through reasoning, logical analysis, and critical reflection. Classical theories of knowledge further refine this understanding by proposing that knowledge encompasses familiarity, comprehension, or awareness acquired through experience or education, but it must meet specific criteria to be considered valid. According to this framework, a belief qualifies as knowledge only if it is true, justified, and genuinely held

(Bartlett & Peterson, 2011). Consequently, a false belief or a mistaken assumption, regardless of whether it is sincerely held, cannot be considered knowledge. In addition, truth alone is not sufficient; the belief must also be supported by evidence or rational justification.

Knowledge can be both implicit and explicit. Implicit knowledge refers to practical skills, abilities, and expertise acquired through practice, while explicit knowledge denotes theoretical understanding or conceptual mastery of a subject (Berger, 2012). Furthermore, knowledge can vary in its level of formalization: it may be systematically organized and codified, or it may be informal and derived through observation, intuition, or experience. The process of acquiring knowledge involves complex cognitive mechanisms, including perception, reasoning, communication, and reflection, all of which are intertwined with the individual's ability to learn, apply, and evaluate information. Moreover, knowledge is intrinsically linked to awareness, as it shapes how humans perceive, interpret, and respond to information from their environment.

In healthcare, definitions of knowledge and awareness are diverse, reflecting the complexity of human cognition and behavior in health-related decision-making. Waller, McCaffery, and Wardle (2013) defined awareness as the effective utilization of health services by the population, highlighting that knowledge alone does not guarantee behavioral action. According to Stark, Gregoire, and Lancaster (2011), awareness can be understood through two complementary streams. The first stream emphasizes internal cognitive processes, where individuals recognize health issues and assess their personal relevance and severity. For instance, to seek professional help for juvenile diabetes, a person must first be aware of the condition and perceive it as serious enough to warrant action (Sabates & Feinstein, 2016). If this internal recognition does not occur, meaningful awareness of the disease is unlikely to develop, which may prevent timely intervention or care.

The second stream considers external, social, and environmental factors that shape healthcare-seeking behaviors. The mere availability of healthcare facilities does not ensure their utilization; socio-economic conditions, cultural beliefs, perceptions of healthcare quality, and accessibility strongly influence an individual's decisions. Factors such as income, education, gender roles, social norms, beliefs about the effectiveness of treatment, and personal health literacy all play pivotal roles in determining whether individuals seek care and which services they choose (Lowy & Schiller, 2016). Globally, significant gaps in the use of healthcare services remain, highlighting the importance of strategies that improve both awareness and access, particularly for conditions like juvenile diabetes that require early recognition and consistent management. Understanding these internal and external determinants is critical for the development of effective health education programs, preventive strategies, and patient-centered interventions. By integrating knowledge, awareness, and contextual factors, healthcare systems can promote timely help-seeking behavior and improve health outcomes among populations at risk.

2.2 Theoretical Framework

The theoretical framework will describe the theory and explain why the research problem under this study exist. It will relate the topic under study to the theory and explain why postulated solution may work.

2.2.1 Health Belief Model

The health belief model asserts that when a person believes he or she is susceptible to a health problem with severe consequences, the person will more likely conclude that the benefits outweigh the barriers associated with changing one's behavior to prevent the problem. The health belief model is a great tool for nursing research offering a theoretical framework for helping patients prevent chronic disease or, if disease is present, improve quality of life.

The Health Belief Model (HBM) was developed in the early 1950s by social scientists at the U.S. Public Health Service in order to understand the failure of people to adopt disease prevention strategies or screening tests for the early detection of disease. Later uses of HBM were for patients' responses to symptoms and compliance with medical treatments. The HBM suggests that a person's belief in a personal threat of an illness or disease together with a person's belief in the effectiveness of the recommended health behavior or action will predict the likelihood the person will adopt the behavior.

The HBM derives from psychological and behavioral theory with the foundation that the two components of health-related behavior are 1) the desire to avoid illness, or conversely get well if already ill; and, 2) the belief that a specific health action will prevent, or cure, illness. Ultimately, an individual's course of action often depends on the person's perceptions of the benefits and barriers related to health behavior.

There are six constructs of the HBM. The first four constructs were developed as the original tenets of the HBM. The last two were added as research about the HBM evolved.

Perceived susceptibility - This refers to a person's subjective perception of the risk of acquiring an illness or disease. There is wide variation in a person's feelings of personal vulnerability to an illness or disease.

Perceived severity - This refers to a person's feelings on the seriousness of contracting an illness or disease (or leaving the illness or disease untreated). There is wide variation in a person's feelings of severity, and often a person considers the medical consequences (e.g., death, disability) and social consequences (e.g., family life, social relationships) when evaluating the severity.

Perceived benefits - This refers to a person's perception of the effectiveness of various actions available to reduce the threat of illness or disease (or to cure illness or disease). The course of action a person takes in preventing (or curing) illness or disease relies on consideration and evaluation of both perceived susceptibility and perceived benefit, such that the person would accept the recommended health action if it was perceived as beneficial.

Perceived barriers - This refers to a person's feelings on the obstacles to performing a recommended health action. There is wide variation in a person's feelings of barriers, or impediments, which lead to a cost/benefit analysis. The person weighs the effectiveness of the actions against the perceptions that it may be expensive, dangerous (e.g., side effects), unpleasant (e.g., painful), time-consuming, or inconvenient.

Cue to action - This is the stimulus needed to trigger the decision-making process to accept a recommended health action. These cues can be internal (e.g., chest pains, wheezing, etc.) or external (e.g., advice from others, illness of family member, newspaper article, etc.).

Self-efficacy - This refers to the level of a person's confidence in his or her ability to successfully perform a behavior. This construct was added to the model most recently in mid-1980. Self-efficacy is a construct in many behavioral theories as it directly relates to whether a person performs the desired behavior.

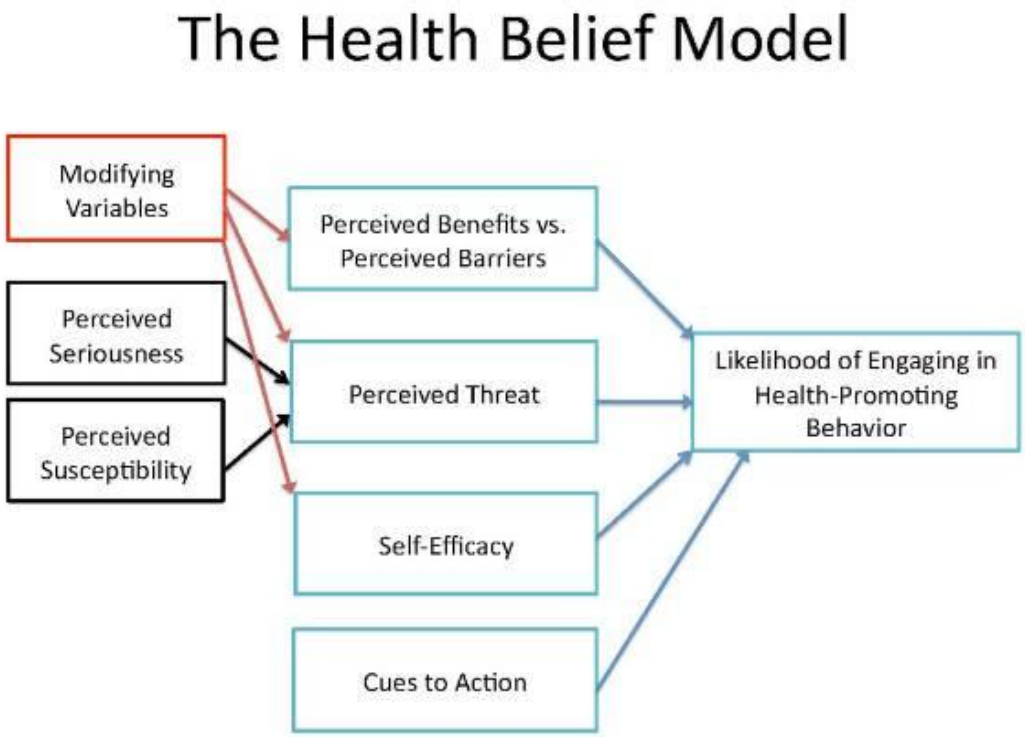


Figure 2.1 Health Belief Model

Application to the Study

The HBM assumes that feeling vulnerable to a condition and claiming it as a serious health problem is a motivational factor that will increase people's action in taking preventive measures. Given acceptable screening methods, the challenge becomes how to help the individual in developing countries understand their risk of juvenile diabetes and that early detection of diabetes is not a death sentence.

According to this model, a person's willingness to engage in a health-seeking behaviour is influenced by perceived risks, perceived seriousness of the disease, perceived susceptibility, and perceived benefits, barriers to actions, cue to action and other demographic factors, The Behaviour Health Model is known for its effectiveness in assessing educational needs. Education is one key to managing diabetes. Kachroo & Etzel (2020) indicated that low literacy and poverty are barriers to achieving preventive measures. Health literacy is essential for participation in health education.

The individual who perceives he is susceptible or at high risk of having diabetes will go for the diabetes screening, an individual who perceives the severity of the disease will undergo the diabetes screening and management, an individual may perceive barriers that affect his utilization of the health service and this may affect decision making, barriers may be cost, accessibility of service, distance and so on, but if he perceives the benefits of having this service done he may overlook the barrier and go for the management and some conditions or circumstances that individual witness or experience directly or indirectly may encourage him to go for the management. Finally other demographic factors may influence perception of diabetes screening such as age of the individual, the attitude of the individual – a positive attitude may

increase his level of perception or negative attitude which may hinder his awareness, the educational level of the individual for example, someone that is educated will have increased knowledge and understanding toward the screening than an uneducated man, and also the individual awareness toward the disease may influence his awareness of the screening services.

2.3 Empirical Review

Nutritional Knowledge and Dietary Habits among Patients with Diabetes

Understanding the nutritional knowledge and dietary habits of individuals living with type 2 diabetes mellitus (T2DM) is crucial for improving self-management and overall health outcomes. A study conducted by Alharbi et al. (2023) in Madinah, Saudi Arabia, assessed dietary knowledge among 315 T2DM patients attending a specialized diabetic center. Using a self-prepared dietary knowledge questionnaire (DKQ), analyzed through SPSS v.26, the researchers found that 62.2% of participants had an average level of dietary knowledge. The study highlighted specific deficiencies, including poor understanding of carbohydrates (30.15%), fats, food choices (47.7%), and types of food (34.6%), although protein knowledge was deemed acceptable at 56.5%. These results underscore the importance of structured nutrition education programs tailored to diabetic patients, emphasizing a balanced diet to support glycemic control and long-term health.

Similarly, Ali and Amidu (2023) investigated the nutritional knowledge and dietary practices of diabetic patients attending the Bono Regional Hospital in Sunyani, Ghana. Utilizing a cross-sectional descriptive quantitative design, 150 participants were recruited through simple random sampling. Data collection involved a semi-structured questionnaire and food frequency assessments, while BMI measurements followed WHO standards. Statistical analyses using IBM

SPSS (v20) revealed that 77.3% of participants demonstrated adequate knowledge of diabetes and nutrition, attributed to consistent education from healthcare providers and strong adherence to modern medicine and dietary recommendations. Overall, 57.3% exhibited good dietary practices. Factors such as age and educational level significantly correlated with nutritional knowledge, whereas gender, religion, occupation, ethnicity, and marital status did not. The study emphasized the need for continuous dietary counseling to further enhance patients' nutrition and dietary adherence.

In Bangladesh, Shakhil et al. (2024) conducted a multi-center cross-sectional study exploring the relationship between nutrition knowledge, dietary intake, and diabetes self-management among 411 adults with T2DM. Using a validated semi-structured questionnaire and a three-day 24-hour dietary recall, the study assessed self-management behaviors and nutrition knowledge. Analyses employing logistic regression, Pearson's correlation, and independent t-tests indicated that 59.4% of participants maintained good dietary control, although only 14.4% engaged in regular physical activity. Adherence to medication was observed in 49.4% of participants, effective self-monitoring in 44%, and only 27% possessed adequate nutritional knowledge. Importantly, individuals with better glycemic control demonstrated substantially higher adherence to dietary recommendations and physical exercise. Patients with poor nutritional knowledge consumed significantly more carbohydrates (251 ± 62 g) and less dietary fiber (16.7 ± 4.5 g) than those with optimal glycemic control (213 ± 47 g carbohydrates and 20.5 ± 6.1 g fiber). The study concluded that improving nutrition knowledge is integral to effective diabetes self-management and better glycemic outcomes.

Abboud et al. (2024) explored dietary knowledge and eating habits among 351 T2DM patients in Lebanon through a cross-sectional survey utilizing snowball sampling. Data were collected using

the UK Diabetes and Diet Questionnaire and a dietary knowledge questionnaire to assess both the frequency of food consumption and knowledge of food groups. Statistical analyses included t-tests, Mann-Whitney tests, ANOVA, and Kruskal-Wallis tests, while correlation and regression analyses identified factors associated with dietary knowledge and eating habits. Findings revealed that 67% of participants had adequate dietary knowledge, though 75% exhibited less healthy eating habits. Positive associations were observed between dietary knowledge and occupation, BMI, comorbidities, and recent HbA1c testing. Healthier eating habits were linked to higher family income, physical activity, family history of diabetes, and support from family or friends in medication adherence. The study emphasized the importance of nutrition education and awareness campaigns targeting both patients and their families to foster informed dietary choices and promote healthier eating patterns.

Anneleye et al. (2022) conducted a facility-based cross-sectional study in public hospitals in Dire Dawa, Eastern Ethiopia, examining dietary knowledge and practices among 253 T2DM patients. Systematic random sampling was employed, with primary data collected via face-to-face interviews and checklists. Analyses in SPSS v22 included descriptive statistics and multivariate logistic regression to identify factors influencing dietary practice. Findings indicated that 53.8% of participants exhibited poor dietary practices, with 78.8% having fasting blood sugar levels ≥130 mg/dL and 52.8% displaying inadequate dietary knowledge. Factors contributing to poor dietary habits included lack of nutrition advice from healthcare providers, limited follow-up duration, insufficient family support, and low motivation. The study highlighted the need for structured nutritional education, psychosocial support, and family engagement to improve adherence to dietary recommendations in diabetic care.

Dietary pattern of patients with diabetes

Investigating dietary patterns in Nigeria, Olatona et al. (2021) conducted a cross-sectional study among 342 adult diabetic patients attending outpatient clinics in Lagos teaching hospitals. Using a pre-tested interviewer-administered questionnaire and a food frequency questionnaire, researchers assessed dietary habits and BMI relative to WHO standards. Analyses revealed that only 37% of participants had good nutritional knowledge. While most participants (69.3%) consumed three meals daily, 59.1% skipped meals, 23.4% consumed alcohol, and only 12.3% included fruits and vegetables in their daily diets. Processed cereals were the most frequently consumed food items, and 74% of participants were overweight or obese. The study concluded that nutritional knowledge and dietary practices were suboptimal, emphasizing the need for targeted dietary counseling to improve nutrition and reduce obesity-related risks in diabetic populations.

Chad et al. (2020) investigated diabetes-related nutritional knowledge and dietary adherence in 42 T2DM patients from a tertiary hospital using a mixed-methods design. The DRNK questionnaire and the Alternate Healthy Eating Index 2010 assessed diet quality and knowledge, complemented by semi-structured interviews exploring barriers and enablers to adherence. Results revealed a poor mean DRNK score of 39.7% (±17.7) and diet quality of 54.2% (±9.4). While there was no direct correlation between dietary knowledge and diet quality, a moderate positive association was observed between DRNK and psychosocial self-efficacy. Thematic analysis identified barriers such as obesogenic environments, time constraints, conflict with personal values, stress, low motivation, and knowledge gaps, alongside enablers including personal motivation, fear of complications, adequate DRNK, and social support. The study concluded that multiple mediating factors influence dietary adherence beyond knowledge alone.

Finally, Mphasha et al. (2021) assessed dietary knowledge and its impact on dietary intake among 217 diabetic patients in Senwabarwana, Limpopo, South Africa, using a convergent mixed-methods parallel design. The quantitative phase involved structured questionnaires, while the qualitative phase used phenomenological interviews analyzed via Tesch's eight-step inductive coding. Quantitative results indicated that 81% of participants understood the importance of nutrition and recognized that large portion sizes could elevate blood sugar levels. Qualitative findings highlighted that family eating patterns often prevented appropriate portion control. Only 28.5% of quantitative participants regularly consumed breakfast. The study emphasized the need for family-centered diabetes care approaches, demonstrating that while patients understood nutritional principles, social and familial factors strongly influenced dietary behaviors.

Collectively, these studies illustrate that while some diabetic patients possess adequate nutritional knowledge, there remain substantial gaps in dietary understanding and adherence to recommended eating practices. Factors such as educational level, age, healthcare provider guidance, family support, and psychosocial influences significantly impact dietary behaviors. Addressing these gaps through structured nutritional education, counseling, family-centered interventions, and ongoing support is essential to enhance dietary practices, glycemic control, and long-term health outcomes for individuals living with type 2 diabetes mellitus. Emphasis on culturally appropriate dietary advice, the promotion of healthy eating habits, and the integration of nutrition education into routine clinical care is recommended to ensure improved self-management, optimal metabolic outcomes, and a reduction in diabetes-related complications across diverse populations.

Factors Influencing Food Consumption Pattern Among Patients with Diabetes

Understanding the factors that influence food consumption patterns among patients with type 2 diabetes mellitus (T2DM) is crucial for designing effective dietary interventions and promoting better disease management. Numerous studies from diverse geographic contexts have investigated these factors, highlighting the roles of socio-demographic characteristics, family and social support, health literacy, access to healthy foods, and behavioral habits in shaping dietary practices among diabetic patients.

A study conducted by Upreti et al. (2023) in Lalitpur District, Nepal, explored the dietary practices of T2DM patients using Pender's Health Promotion Model (PHPM). The research employed a quantitative, cross-sectional design, involving 450 participants aged between 40 and 65 years from two healthcare centers—one for diabetes and another for thyroid care. A structured survey questionnaire was developed based on the PHPM, piloted, and validated for reliability. Statistical analyses including univariate, bivariate, and multivariate analyses were performed using SPSS version 25. The findings revealed that patients who belonged to joint families, refrained from alcohol consumption, had a positive attitude toward healthy eating, did not smoke, received reminders to eat healthy foods, and engaged in physical activity were significantly more likely to demonstrate good dietary practices. Notably, higher odds of sufficient dietary adherence were observed among participants from joint families (adjusted Odds Ratio [aOR] = 2.332; 95% CI: 1.958–2.989), literate individuals (aOR = 1.783; 95% CI: 1.256–2.531), those with no history of smoking (aOR = 0.935; 95% CI: 0.609–1.434), and participants with family support and access to healthy foods. Daily engagement in physical activity also emerged as a strong predictor of adherence (aOR = 1.982; 95% CI: 1.369–2.364). The study concluded that nuclear family structures, illiteracy, lower income, smoking, alcohol

use, poor family support, limited access to healthy foods, and low physical activity negatively influenced dietary behavior among T2DM patients. Based on these findings, the authors recommended PHPM-based educational interventions targeting both patients and their family members to ensure improved dietary practices and overall quality of life.

Similarly, Anggrani et al. (2022) investigated factors associated with dietary behavior among patients with T2DM in rural Indonesia. This descriptive cross-sectional study included 120 physically healthy participants aged above 18 years, all diagnosed with T2DM for at least six months. Data were analyzed using stepwise regression modeling. The results revealed that social support ($\beta = 0.272$, $p < 0.001$), adherence to diabetes medications ($\beta = 0.169$, $p = 0.003$), duration of diabetes ($\beta = 0.118$, $p = 0.0047$), and the presence of diabetes complications ($\beta = 0.197$, $p = 0.008$) were significant predictors of dietary behavior, explaining 34.2% of the variance in dietary patterns. The study concluded that social support plays a critical role in improving dietary behavior, suggesting that interventions aimed at enhancing familial and social support mechanisms could enhance adherence to recommended dietary practices among patients with T2DM.

Mayur et al. (2022) conducted a study on factors associated with the consumption of diabetic diets among T2DM patients in Ahmedabad, Western India. The research involved 399 participants diagnosed with diabetes for at least one year who attended specialized diabetic care centers. Data collection included an interviewer-administered questionnaire addressing socio-demographic characteristics, family history of diabetes, behavioral patterns, glycemic status, hypertension, obesity, diet-related history, and cooking methods. Laboratory measurements included fasting blood sugar, glycosylated hemoglobin (HbA1c), blood pressure, and lipid profile. Findings indicated that while 73% of participants reported consuming a diabetic diet,

only 35% achieved good glycemic control (HbA1c <7%). A majority of participants (75%) had a positive family history of diabetes, and 52% were classified as obese. Dietary advice was primarily sourced from doctors in 77% of cases, and 36% employed boiling and roasting as primary cooking methods. Multivariate analysis identified visits to dietitians, level of education, intake of low-fat foods, and family history of diabetes as independent predictors of diabetic diet adherence. The study underscored the need for longitudinal studies to establish stronger associations between diabetic diet consumption and glycemic control outcomes.

Dureti et al. (2023) explored dietary practices among T2DM patients attending follow-up clinics in public hospitals in central Ethiopia. The hospital-based cross-sectional study involved 421 randomly selected participants from February to March 2022. Data were collected using structured and pre-tested interviewer-administered questionnaires, with descriptive, bivariate, and multivariate logistic regression analyses performed using SPSS. Only 35.6% of participants demonstrated good dietary practices. Significant predictors of good dietary adherence included diabetes knowledge (AOR = 9.2; 95% CI: 4.4–19.4), food-secured households (AOR = 3.3; 95% CI: 1.6–6.9), high self-efficacy (AOR = 6.6; 95% CI: 3.2–13.9), guidance from healthcare professionals (AOR = 2.9; 95% CI: 1.3–6.4), complete dietary changes following diagnosis (AOR = 2.3; 95% CI: 1.1–4.8), and female gender (AOR = 3.6; 95% CI: 1.6–8.1). The study highlighted the need for continuous and comprehensive patient education to promote adherence to dietary recommendations and reduce the risk of diabetes-related complications.

Anneleye et al. (2022) conducted a facility-based cross-sectional study among 253 T2DM patients attending public hospitals in Dire Dawa, Eastern Ethiopia, to assess dietary knowledge and practice. Data were collected through face-to-face interviews and checklists and analyzed using SPSS version 22. The study found that 53.8% of participants exhibited poor dietary

practices, while 52.8% had poor dietary knowledge. Factors associated with poor dietary practices included lack of nutrition advice from healthcare providers, shorter follow-up duration, inadequate family support, and despondency. The absence of up-to-date nutritional guidelines in follow-up clinics further exacerbated poor dietary adherence. The study concluded that strengthening nutrition education, counseling services, family support, and psychosocial interventions is vital to improving dietary habits among T2DM patients.

In a comparative study in Saudi Arabia, Afnan and Haya (2024) evaluated the food intake patterns of 207 T2DM patients and 207 healthy individuals. Anthropometric measurements, dietary intake, and physical activity were assessed via structured interviews. Results indicated that diabetic patients consumed significantly more vegetables (including green leafy and starchy vegetables), fruits, proteins, and milk compared to healthy controls. Furthermore, 79.7% of diabetic participants consumed whole-wheat bread, while 54.6% consumed low-fat milk. Discretionary foods, sweetened juices, and pastries were significantly reduced among diabetics, with increased consumption of healthy fats such as olive oil (78.7%). Despite these improvements in dietary patterns, the study noted suboptimal physical activity levels among participants. The authors concluded that while diabetic patients generally follow healthier diets, additional interventions are needed to enhance physical activity engagement.

Rashid et al. (2023) investigated dietary patterns and physical activity among 301 T2DM patients at the National Institute of Diabetes and Endocrinology in Karachi, Pakistan. Using structured questionnaires and anthropometric assessments, the study found that 42% of patients consumed fewer than one serving of fruit, and 45% consumed fewer than three servings of vegetables daily. Additionally, 77 patients distributed carbohydrates evenly throughout the day, while higher HbA1c levels were associated with higher intake of roti (>3 pieces/day) and full-plate rice. Only

102 participants were physically active, highlighting barriers such as leg pain and lack of motivation. The study emphasized the need for counseling on balanced diets and portion control to manage glycemic levels effectively.

Mahdi et al. (2022) examined the relationship between dietary habits and T2DM prevalence in a Middle Eastern cohort of 9,261 adults aged 35–70 years in Yazd, Iran. Dietary habits such as meal frequency, fried-food consumption, added salt, and grilled-food intake were assessed. The study found that consuming more than six meals per day significantly increased the odds of developing T2DM (OR = 2.503; 95% CI: 1.651–3.793). Frequent consumption of fried foods was also associated with higher T2DM prevalence (OR = 1.294; 95% CI: 1.004–1.668). The study concluded that meal frequency and fried-food consumption are key dietary factors influencing T2DM risk, warranting further longitudinal research.

Senadheera et al. (2019) investigated dietary habits among 100 T2DM patients aged 35–70 years. The cross-sectional study revealed that 45.5% of participants consumed rice-based meals for all three daily meals, only 67% consumed fruits daily, and 71% consumed full-cream milk. Non-caloric sweetener usage was nonexistent. Despite 44% of participants being overweight or obese, only 60% acknowledged their weight status. Physical activity levels were low, with only 14% exercising daily. The study emphasized the importance of educating T2DM patients on dietary modifications and regular physical activity.

Collectively, these studies underscore that dietary practices among T2DM patients are influenced by a complex interplay of socio-demographic factors, family and social support, health literacy, physical activity, and cultural habits. Interventions that combine nutrition education, counseling, family involvement, and promotion of physical activity are essential to improve adherence to

dietary recommendations and enhance glycemic control. Moreover, access to healthy foods, regular follow-up, and individualized guidance from healthcare providers remain critical in shaping sustainable dietary behaviors among T2DM patients across diverse settings.

2.4 Summary of the Related Literature

Majority of the respondents had an idea of diabetes but lack the nutritional knowledge of what diabetes entails and the importance of dietary changes to diabetes. The respondents that showed a good level of nutritional knowledge of diabetes was attributed to their dietician, friends, internet and nurses. This positively influenced their dietary habits as compared to those with poor level of knowledge of nutritional knowledge of diabetes. The dietary habits of the respondents varied due to complexity in individuals, of which knowledge and beliefs influenced their dietary habits. Hence the need for this study to identify the knowledge gap and determine if there will be a positive change in the dietary habits among patients with diabetes if given adequate information.

CHAPTER THREE

RESEARCH METHODS

This chapter discusses the research methodology that was applied during this study to understand the nutritional knowledge of diabetes and dietary habits among patients with diabetes in a tertiary health institution. It entails the research design, study setting, target population, sample and sampling technique, instruments of data collection, validity and reliability of instrument, method of data collection, method of data analysis and ethical consideration.

3.1 Research Design

A non-experimental descriptive survey design was utilized in this study. The design was used to ascertain the level of nutritional knowledge of diabetes, dietary habits, factors influencing food consumption pattern and ascertain if social demographic affects patients with diabetes.

3.2 Research Setting

The study was carried out in the University of Benin teaching hospital, Benin-city, Edo state. It is located in Egor local government area of Benin-city along the Benin-Lagos expressway. The University of Benin teaching hospital was founded in 1973. It is a full-fledged hospital offering high quality health care service in response to the changing demands for effective, efficient and affordable treatment.

The University of Benin teaching hospital comprises of Medical wards, Surgical wards, Orthopedic, Children's ward, Maternity complex, Ante-natal clinic, Family planning clinic, Renal dialysis ward, Emergency ward, Tuberculosis ward/unit and Theatres and Out-patients clinic/health center. It is a tertiary health institution where patients are referred to from the

L.G.A., state, private, mission hospitals etc. It serves as a base for clinical experience for student nurses and medical students.

3.3 Target Population

The population of the study represents the group that the researcher deals with during the process of the study. This study was carried out among patients with diabetes in University of Benin teaching hospital to determine the number of people who visited the consultant out-patient clinic in the past 3 months (March-May).

March	135 patients
April	157 patients
May	148 patients
Total	440 patients

Inclusion criteria

i. Patients with diabetes in University of Benin teaching hospital visiting the consultant out patients department.
ii. Patients who are interested in the study.

Exclusion criteria

i. Patients without diabetes in University of Benin Teaching Hospital visiting the consultant outpatient department.
ii. Patients who are not interested in the study.

3.4 Sample Size Determination

Census survey was used to recruit respondents that were available as at the time the questionnaire will be administered.

(TARO YAMANE, 1967)

Where n=sample size

N=population size

D =level of precision (confidence interval)

N=440

D=0.05

n= N/1+N(d)2

n= 440/1+440(0.05)2

n=440/1+1.1

n=440/2.1

n=209.5

10% attrition rate= 10% sample size

= (10/100) x209.5

=20.9

Total sample size=209.5 +20.9=230

3.5 Sampling Techniques

The sampling technique that was used is convenient sampling method. Convenient sampling method is a non-probability sampling method, in which the researcher is at will to choose the most conveniently and economically (in terms of time) available persons for the study, that is, people who are interested and available in no particular order. The department that was be used

in this study was the consultant out-patient clinic, male and female patients have equal chances of being chosen. Patients from various religious background and ethnic groups were chosen to ensure unity in diversity.

3.6 Instrument for Data Collection

The instrument for data collection that was used in this study was a self-structured questionnaire; a closed-ended questionnaire was utilized for this study. The questions were carefully structured to get an in-depth information that will be relevant to the study from the respondents. The questionnaire had four sections, section A contained socio-demographic data with five items, section B contained the nutritional knowledge of diabetes with six items, each item had one correct answer, section C contained the dietary habits of diabetic patients with six items using a Likert scale and section D their food consumption pattern with six items using a Likert scale.

3.7 Reliability of the Instrument

Reliability is consistency of an instrument in collecting the same data, which means appropriateness for use over time. In order to be sure that the instrument is reliable, a pre-testing was done using 10% of the proposed study subjects. 23 patients from Central Hospital, Benin-city were included in pre-testing the reliability of the instrument. Corrections were made where necessary; the reliability of the instrument was confirmed using the Cronbach's alpha test. Cronbach's alpha test was used for dichotomous data, that is questions with 'yes' or' no' answer or' male and female'.

3.8 Validity of the Instrument

Validity is defined as the extent to which an instrument measures what it is supposed to measure and perform as it designed to perform. Face and content validity was considered in the study.

Face validity involves simply looking at the instrument to be used and inspecting them at face value to be sure that it measures what it is supposed to measure. Expert statisticians were consulted with questionnaire to ensure validity. The instrument for the research work was validated by a medical-surgical nurse, an expert statistician and the project supervisor, who scrutinized the content and gave approval for its use.

3.9 Method of Data Collection

Data were collected through oral and written consent from the respondents, after explaining to them the purpose of the study. There was no encroachment of their visit to the doctor, they were waited upon, after which respondents were taken to a section in the clinic, where questionnaire was administered. Those questions not understood were explained and illiterate respondents were given assistance.

3.10 Method of Data Analysis

Data are pieces of information used in the course of investigation. Data analysis is the process of extracting information from data. Before the analysis of data, it must first be collated and organized. Descriptive and inferential statistics were used. Frequency count, percentages, means and standard deviation were calculated and values represented using tables and pie-charts as appropriate. Descriptive statistics of frequency and percentages were used for the objectives 1 to 3 and the inferential statistics (Anova) were used for hypothesis testing.

3.11 Ethical Consideration

The researcher is aware of the ethical and moral principles associated with data collection from respondents. Privacy which is one of the most important aspects of human rights will be maintained. Ethical approval will be sought from the university of Benin teaching hospital

review committee before collection of data. The major ethical principles that will be uphold during this study were:

a. **Autonomy:** The respondents will not be forced into participating in the research project, the respondents will be allowed to make decisions for themselves without coercion.
b. **Maintenance of confidentiality:** Throughout this study, the researcher will not disclose personal details of the respondents like name, phone no and address. Confidentiality will be ensured by not divulging the information to others and giving access or control to just the supervisor and the statistician.
c. **Informed consent:** The researcher will ensure that the respondents had full knowledge of the study, purpose and procedures to be followed, the possible risks and benefits and they will give their full consent before taking part in the study.
d. **Avoidance of plagiarism:** Studies will be properly referenced.
e. **Freedom from exploitation:** In this study, the respondents will be assured that the information they released was not used against them, also financial exploitation was avoided.
f. **Right to fair treatment:** All respondents will be treated fairly without discrimination, and all those who will be interested in the study will have the opportunity of participation.

CHAPTER FOUR

RESULTS

This chapter presents the results of this research. The results consist of findings generated from data collected using semi-structured questionnaires.

Table 4.1: Socio-demographic characteristics of respondents

Variables	Attributes	Frequency	Percentage
Age	20-25	0	0.0
(years)	26-30	2	0.9
	31-35	20	8.7
	36-40	35	15.2
	41-45	63	27.4
	46-50	39	17.0
	Above 50	71	30.9
Sex	Female	97	42.2
	Male	133	57.8
Marital Status	Single	29	12.6
	Married	167	72.6
	Divorced	29	12.6
	Others	5	2.2
Types of Diabetes	Type 2	188	81.7
	Type 1	28	12.2
	Gestational	14	6.0
Duration of Diabetes	0-5 years	168	73

	5-10 years	49	21.3
	Above ten years	13	5.7

n=230 respondents

The table above showed socio-demographic characteristics of respondents. Majority (30.9%) of the respondents are above 50years; also majorly males (57.8%). About three quarters (72.6%) of the respondents are married. The majority (81.7%) of the respondents have type 2 diabetes; also majority (73%) had diabetes for 0-5 years.

Table 4.2: Nutritional Knowledge of Diabetes

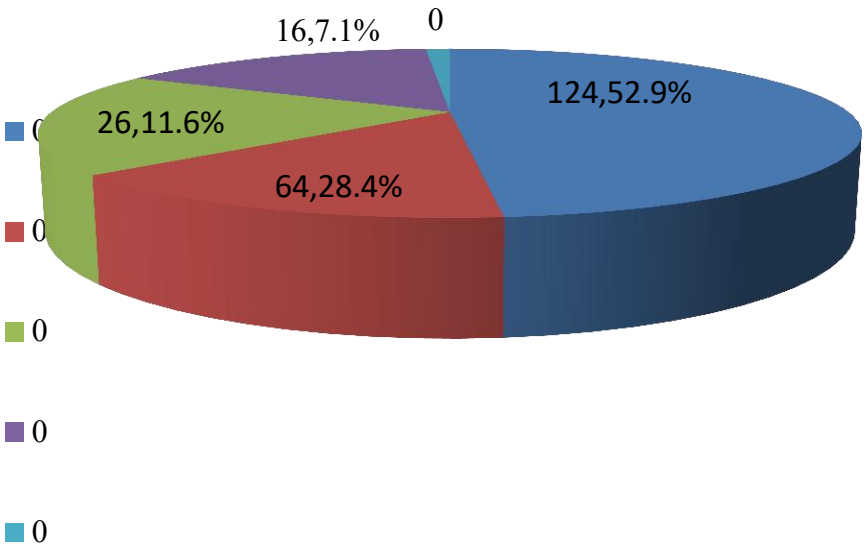
(N=230)

	Frequency	**Percentage**
What is your primary source of information?		
Family/Friends	16	7.1
Nurses	119	52.9
Dieticians	26	11.6
Internet	64	28.4
Books/Magazine	0	0
Diabetes is ……..		
Blood sugar level above 126mg/dl	175	76.1
Blood sugar level between 100-125mg/dl	51	22.2
Blood sugar level between 50-100mg/dl	4	1.7
Meals that are good for diabetes include		
Sugar free foods	62	27
Vegetables rich foods	66	28.7
Foods rich in whole grains	42	18.3
Foods that are high in protein	35	15.2
Foods that are high in carbohydrates	6	2.6
Foods that are high in fats	19	8.3
Risk factors of diabetes		
Family history of diabetes	185	80.4

Inadequate physical activity	2	0.9
Stress	7	3
Unhealthy diet	27	11.7
Smoking	4	1.7
Alcohol drinking	5	2.2
Foods that can be used to control blood sugar		
Foods that are high in carbohydrates	5	2.2
Sugar free foods	51	22.2
Foods rich in whole grains	131	57.0
Vegetable rich foods	38	16.5
Foods that are high in fats	0	0.0
Foods that raises blood sugar		
Foods that are high in carbohydrates	131	57
Sugar free foods	0	0
Foods rich in whole grains	38	16.5
Vegetable rich foods	5	2.2
Foods that are high in fats	51	22
Foods that are high in protein	5	2.2

The space above shows respondents nutritional knowledge of diabetes. It was reported that majority 175(76.1%) opined that diabetes is blood sugar above 126mg/dl, 51(22.2%) reported that diabetes is blood sugar level between 100-125mg/dl while 4(1.7%) reported that diabetes is blood sugar level between 50-100mg/dl. For meals that are good for diabetes, 66(28.7%) opined that vegetables rich foods, 62(27%) said sugar free foods, 42(18.3%) reported foods rich in whole grains, 35(15.2%) opined foods that are high in protein, 19(8.3%) reported foods that are high in fats while 6(2.6%) reported foods that are high in carbohydrates. For risk factors of diabetes, majority 185(80.4%) reported family history of diabetes, 27(11.7%) opined unhealthy diet, 7(3%) reported stress, 5(2.2%) reported alcohol drinking, 4(1.7%) opined smoking while 2(0.9%) reported inadequate physical exercise. For foods that can be used to control blood sugar, 38(16.5%) opined vegetables rich foods, 51(22.2%) said sugar free foods, 131(57%) reported foods rich in whole grains while 5(2.2%) reported foods that are high in carbohydrates. For foods that raises blood sugar, 5(2.2%) opined vegetables rich foods, 38(16.5%) reported foods rich in whole grains, 131(57%) reported foods that are high in carbohydrates, 51(22%) opined foods that are high in fats while 5(2.2%) reported foods that are high in protein

Figure 4.1: Sources of Information about nutritional knowledge of diabetes



The figure above shows sources of information about diabetes. Majority of the respondents (52.9%) got their information about diabetes from nurses, (11.6%) got their information from dieticians, (7.1%) got their information from family and friends, (28.4%) got their information from the internet.

Table 4.3: Level of nutritional knowledge of Diabetes

	Frequency	Percentage
Poor (0-49.9%)	66	28.7
Fair (50-69.9%)	122	53.0
Good (70-100%)	42	18.3

Table 4.3 shows the level of nutritional knowledge of diabetes. Sixty-six (28.7%) of the respondents have poor nutritional knowledge, 122(53.0%) have fair nutritional knowledge, while 42(18.3%) have good nutritional knowledge about diabetes.

Table 4.4: Dietary Habits

		SD	D	A	SA	$\bar{x}$	Remark
1	I consider my dietary choices when managing my diabetes	66(28.7)	80(34.8)	46(20.0)	38(16.5)	2.24	Poor
2	I follow a specific meal plan for diabetes management	88(38.3)	83(36.1)	28(12.2)	31(13.5)	2.01	Poor
3	I choose whole grains over refined grains	48(20.9)	94(40.9)	70(30.4)	18(7.8)	2.25	Poor
4	I limit my intake of sugar	27(11.7)	33(14.3)	124(53.9)	46(20.0)	2.82	Good

	drinks						
5	I do not take alcohol	51(22.2)	88(38.3)	66(28.7)	25(10.9)	2.28	
6	I take white meat instead of red meat	45(19.6)	65(28.3)	84(36.5)	36(15.7)	2.48	
	Overall					**2.35**	**Poor**

Good Habit = Mean score >2.50

The table above showed respondents dietary habits. The table indicates that in all the items assessing dietary habits, only items 4 gave a mean score indicating good dietary habits. The other items showed poor dietary habits. The overall mean also indicates poor dietary habits.

Table 4.5: Factors Influencing Food Consumption Pattern

	A	SA	D	SD	X	Remarks
Taste preferences significantly impact my food selection	75(32.6)	103(44.8)	38(16.5)	14(6.1)	2.96	Factor
Food prices significantly impact my purchasing decisions	39(17.0)	119(51.7)	63(27.4)	9(3.9)	2.68	Factor
Emotional state impacts my food consumption	18(7.9)	55(24.2)	97(42.7)	57(25.1)	2.62	Factor
Cultural heritage shapes my dietary preferences	43(18.8)	53(23.1)	79(34.5)	54(23.6)	2.26	Not a factor
Availability of affordable healthy food options is important	43(18.7)	110(47.8)	47(20.4)	30(13.0)	2.58	Factor
Seasonal produce influences my food selection	91(39.6)	84(36.5)	34(14.8)	21(9.1)	2.52	Factor

Cut off score = 2.50

The table above showed factors influencing food consumption pattern among respondents. For all the items measured, it showed that as all the items except for item 4 are all factors influencing food consumption pattern as their mean scores were above 2.50.

Hypothesis Testing

There is no significant difference between the knowledge and dietary habits of patients with diabetes attending a tertiary institution, Benin City.

Table 4.6: Relationship between level of knowledge and dietary habits

	Bad	**Good**	**DF**	**P**
Level of knowledge				
Poor (0-49.9)	49(74.2)	17(25.8)	2.368	0.006
Fair (50-69.9)	87(71.3)	35(28.7)		
Good (70-100)	35(83.3)	7(16.7)		

The table shows that there is a significant relationship ($p<0.05$) between the level of knowledge and dietary habits. Since the calculated p value is lesser than the tabulated p value, the null hypothesis is rejected.

CHAPTER FIVE

DISCUSSION OF FINDINGS, CONCLUSION, SUMMARY AND RECOMMENDATION

This chapter entails the discussion of findings, implication for nursing, summary, conclusion, recommendation and suggestion for further studies.

5.1 Discussion of Findings

This research work assessed the nutritional knowledge and dietary habits of patients with diabetes attending a tertiary institution, Benin City, Edo State. In the course of carrying out this study, three research questions were raised. Two hundred and thirty (230) respondents were involved in this study, and data on the social demographic factors of the respondents, nutritional knowledge of diabetes, dietary habits of respondents and factors influencing food consumption pattern were assessed using a structured questionnaire that was designed by the researcher.

5.1.1 Nutritional Knowledge of Diabetes

The findings from this study, shows that the respondents have fair nutritional knowledge of diabetes. This agrees with Alharbi et al., (2023) who found out that majority of the respondents had average nutritional knowledge on diabetes which is in line with Ali and Amidu (2023) who reported that the respondents have average knowledge on diabetes and nutrition. However, only a few 73(28.3%) of the respondents were aware of the types of physical fitness exercises. Also, a greater percentage of the respondents had their nutritional knowledge of diabetes from nurses, closely followed by internet, followed by dieticians, and then family and friends This is in contrast with Shakhil *et al.* (2024) which showed that majority of the respondents got their knowledge from mass media, family and friends.

5.1.2 Dietary Habits

With reference to the findings of this study, the dietary habits of the respondents were poor. This is supported by Olatona et al., (2021) which revealed poor dietary habits of the respondents. This is equally in line with Chad et al., (2020) which reported poor dietary habits. This is supported by Mphasha et al., (2021) which also reported poor dietary habits of the respondents.

5.1.3 Factors Influencing Food Consumption Pattern

The findings of this study showed that taste preferences, emotional state, food prices, availability of healthy option are factors influencing food consumption pattern. This is in contrast with Upreti et al., (2023) which reported alcohol consumption, low income, illiteracy, poor access to healthy foods are factors influencing food consumption pattern. This is also in contrast with Anggrani et al., (2022) which reported social support as a factor influencing food consumption pattern.

Measures that could be utilized to improve the nutritional knowledge of diabetes

With reference to this study, the most effective measure that could be utilized to improve nutritional knowledge of diabetes is through health education, teaching and counselling these persons on the importance of nutrition to their health. Mass media, family and friends, Radio/TV should liase with nurses to encourage adherence to nutritional changes among adults in general, through the dissemination of useful information. This is in line with Mayur et al., (2022) which concluded that the nutritional knowledge of diabetes can majorly be improved by health education and encouragement from family and friends.

5.2 Implication to Nursing Practice

The nursing practice trend towards health promotion will create opportunities for nurses to strengthen the profession's influence on health promotion through health education.

Nursing Practice: Nurses are in the unique position to enlighten these individuals, because they are always in contact with patients/client providing holistic care. For a nurse, to be able to give adequate information, she needs to have a thorough understanding on diabetes, the effect on their health and measures to improve their practice. Nurses should endeavour to health educate this individuals, as they have the right to this knowledge, which will enable them to make informed decisions on their health. During counselling, it is essential that nurses should be able to identify those healthy foods that patients enjoy, and factors that hinders their dietary habits and encourage them to make dietary goals that are achievable. This will help to promote positive health behaviors.

Nursing Education: This is what is hoped to be achieved at the end of the day. With good nutritional knowledge of diabetes, nurses will be better informed to give proper information to clients. Nurses should be involved in giving health education to patients with chronic illness, therefore emphasis must be laid on teaching patients on discharge in the clinic. Students should be involved in the process.

Research: In aspect of research, it increases the awareness of the severity of sedentary lifestyle and its research ability interest, by conducting more research to broaden their nutritional knowledge of diabetes.

5.3 Limitation of the Study

The study was with limitation. The respondents may have been biased in their responses to some items in the instrument, since data retrieved were based on self-reported information from them.

5.4 Summary of the Study

This study on the nutritional knowledge and dietary habits of patients with diabetes attending a tertiary institution, Benin City, Edo state shows the introduction to the study which includes; the background of the study, statement of the problem, objectives of the study, research questions which assessed the nutritional knowledge of diabetes, dietary habits, factors influencing food consumption pattern, social demographic factors and measures to improve the nutritional knowledge of diabetes. The literature reviewed various works that have previously been carried out in various places concerning nutritional knowledge of diabetes, dietary habits and factors influencing food consumption pattern. It showed that the nutritional knowledge of diabetes is a global health challenge.

The research methodology, which is a quantitative descriptive design with a population of 230 respondents. The population was selected conveniently and data was collected with the use of questionnaire. Data was analyzed using frequency, percentages, mean and standard deviation and were presented in tables where applicable. Most of the respondents have nutritional knowledge of diabetes, have poor dietary habits and food prices, emotional state and availability of healthy foods are factors influencing food consumption pattern. Findings of the study were discussed using research questions and relationship with relevant literature reviewed was also carried out.

5.5 Conclusion

Diabetes is a global health challenge, which remains prevalent in both developed and developing countries. The findings of this study, suggests that in order to achieve the optimum goal of improving health in diabetes, patients‘ nutritional knowledge which entails their dietary habits should be considered as a factor to reducing blood sugar. It is paramount that for effective strategies to be made, patients should be actively involved in the management of their health.

From the findings of thus research work, the researcher concluded that majority of the respondents have a good nutritional knowledge of diabetes but have poor dietary habits and food prices, emotional state and availability of healthy foods are factors influencing food consumption pattern.

5.6 Recommendations

The following recommendations are therefore suggested based on the findings of this study.

1. Health education by nurses to enlighten people on the importance of good dietary changes to health, as most people look up to their medical professionals for information and guidance.
2. Mass media outlets such as television, radio, road jingles and posters etc. should be used to disseminate useful information on the importance of nutritional knowledge of diabetes.

5.7 Suggestions for Further Studies

The researcher recommends that further research may be carried out in the following areas:

1. Factors influencing practice of physical fitness exercises among patients with diabetes in Benin City.
2. Factors influencing selfcare management among patients with diabetes in Benin city.

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APPENDIX

QUESTIONNAIRES

DEPARTMENT OF NURSING SCIENCE

UNIVERSITY OF BENIN

BENIN CITY, EDO-STATE

Dear Respondents,

I am a student of the above-named institution, carrying out a research study on **Nutritional Knowledge and Dietary Habits of Patients with diabetes attending a Tertiary Institution, Benin City.**

I will be grateful if you tick the option considered appropriate in the space provided. All information provided is strictly for this research purpose and will be treated confidentially. Thank you

Instruction: Tick (V) the option that is applicable to you.

Section A: Sociodemographic Data

1. Age: 20-25[ ], 26-30[ ], 31-35[ ], 36-40[ ], 41-45[ ], 46-50[ ], Above 50[ ]

2. Sex: Female [ ], Male [ ]

3 Marital Status: Single[ ], Married[ ], Divorced[ ],

3. Type of diabetes: Type 1 [ ], Type 2 [ ], Gestational [ ]

4. Duration of diabetes: 0-5 years [ ], 5-10 years [ ], Above 10 years [ ]

Section B: Nutritional Knowledge of Diabetes. (Select one)

1. What is your primary source of nutrition information? (a) Family/Friends [ ] (b) Nurses [ ] (c) Dietician [ ] (d) Internet [ ] (e) Books/Magazines [ ]

2. Diabetes is ……

- Blood sugar level above 126mg/dl [ ]
- Blood sugar level between 100-125mg/dl [ ]
- Blood sugar level between 50-100mg/dl [ ]

3. Meals that are good for diabetes include

- Sugar free foods [ ]
- Vegetable rich foods [ ]
- Foods rich in whole grains [ ]
- Food that are high in carbohydrate [ ]
- Food that are high in protein [ ]
- Food that are high in fats [ ]

4. What are the risk factors for diabetes mellitus

- Family history of diabetes [ ]
- Inadequate physical activity [ ]
- Stress [ ]
- Unhealthy diet [ ]
- Smoking [ ]
- Alcohol drinking [ ]

5. Foods that can be used to control blood sugar

- Food that are high in carbohydrate [ ]

- Sugar free foods [ ]
- Foods rich in whole grains [ ]
- Vegetable rich foods [ ]
- Food that are high in fats [ ]

6. Foods that raises blood sugar

- Food that are high in carbohydrate [ ]
- Sugar free foods [ ]
- Foods rich in whole grains [ ]
- Vegetable rich foods [ ]
- Food that are high in protein [ ]
- Foods that are high in fat [ ]

Section C: Dietary Habits

		Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**
1	I consider my dietary choices when managing my diabetes				
2	I follow a specific meal plan for diabetes management				
3	I choose whole grains over refined grains				
4	I limit my intake of sugar drinks				

5	I do not take alcohol				
6	I take white meat instead of red meat				

Section D: Factors Influencing Food Consumption Pattern

		Agree	**Strongly Agree**	**Disagree**	**Strongly Disagree**
1.	Taste preferences significantly impact my food selection				
2.	Food prices significantly impact my purchasing decisions				
3.	Emotional state impacts my food consumption				
4.	Cultural heritage shapes my dietary preferences				
5.	Availability of affordable healthy food options is important				
6.	Seasonal produce influences my food selection				