# KNOWLEDGE AND PERCEPTION OF TYPE 1 DIABETES MELLITUS AMONGST ADOLESCENTS IN SELECTED DEPARTMENTS OF THE FACULTY OF ARTS IN UNIVERSITY OF BENIN

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**UNIVERSITY OF BENIN, BENIN CITY**

## DECLARATION

This is to declare that this research project titled **KNOWLEDGE AND PERCEPTION OF TYPE 1 DIABETES MELLITUS AMONGST ADOLESCENTS IN SELECTED DEPARTMENTS OF THE FACULTY OF ARTS IN UNIVERSITY OF BENIN** was carried out by **ENEREMHANGBE OKHAH HILARY** is solely the result of my work except where acknowledged as being derived from other person(s) or resources.

Examination Number:_____

In the (department/school): FACULTY OF NURSING SCIENCES, UNIVERSITY OF BENIN, BENIN CITY.

Signature: _____ Date _____

## CERTIFICATION/APPROVAL

This is to certify that this research project titled "**KNOWLEDGE AND PERCEPTION OF TYPE 1 DIABETES MELLITUS AMONGST ADOLESCENTS IN SELECTED DEPARTMENTS OF THE FACULTY OF ARTS IN UNIVERSITY OF BENIN"** will be carried out by **ENEREMHANGBE OKHAH HILARY** with Matriculation number **BMS1906865** in the faculty of Nursing Science, under the supervision of Mrs, M.A. Iniomor

**ENEREMHANGBE OKHAH HILARY** _____

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**MRS. M. A. INIOMOR** _____

*(Project Supervisor)* SIGN & DATE

**PROF. C.E. OMOROGBE** _____

*(Head of Department Medical Surgical Nursing)* SIGN & DATE

_____ _____

*(External examiner)* SIGN & DATE

## DEDICATION

This work is dedicated to the Almighty Father, the One who kept me alive and made it possible for me to make it this far. His unending grace and mercy upon my life is immeasurable.

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**ABSTRACT**

Type 1 Diabetes Mellitus (T1DM) is a chronic autoimmune disorder predominantly affecting children and adolescents. Despite its rising global prevalence and the lifelong self-management it requires, awareness and understanding of the disease remain low among adolescents. This study aimed to evaluate the knowledge and perception of T1DM among adolescents in selected departments within the Faculty of Arts at the University of Benin. A descriptive cross-sectional survey design was employed, using a structured questionnaire administered to 291 students aged 13 to 19 years. Data were analyzed using SPSS version 25, with descriptive and inferential statistics applied. Findings revealed that while awareness of diabetes was relatively high, only 15.4% of respondents demonstrated good knowledge of T1DM, with 45.4% showing poor understanding. Most respondents (59.5%) could differentiate between Type 1 and Type 2 diabetes, but only 26.1% correctly identified the autoimmune nature of T1DM. Additionally, misconceptions were noted regarding its prevention and management. In terms of perception, 57.7% of the participants held negative views toward the condition, though a significant number acknowledged its seriousness and supported increased awareness. A strong statistical relationship ($p < 0.001$) was found between knowledge level and perception, indicating that improved knowledge correlates with more positive attitudes. However, no significant difference in knowledge or perception was observed across gender. The study concludes that substantial knowledge gaps and misconceptions about T1DM exist among adolescents in the arts faculty, negatively influencing their perception. It recommends targeted health education programs to improve adolescents' understanding and attitudes toward T1DM, thereby promoting early recognition, supportive peer environments, and better disease management.

**Keywords:** Adolescents, Perception, Knowledge, Type 1 diabetes mellitus.

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# CHAPTER ONE

# INTRODUCTION

## 1.0 Background to the study

Diabetes mellitus is a complex disease with multiple underlying causes that impacts people of all ages. Along with cancer, cardiovascular disease, and chronic respiratory disorders, it has been recognized as one of the four main chronic non-communicable diseases (NCDs). The three primary forms of diabetes mellitus are type-1, type-2, and gestational, with type 2 diabetes being the most prevalent. According to latest estimates, around 460 million individuals worldwide suffer from DM (Orok et al., 2024). Diabetes is a chronic metabolic disease characterized by elevated levels of blood glucose (blood sugar)which leads overtime to serious damage to the heart, blood vessels, eyes, kidney and nerves (WHO, 2020). The chronic illness known as type 1 diabetes is brought on by the autoimmune destruction of pancreatic β cells (Quattrin et al., 2023). Type 1 diabetes mellitus (T1DM) is an endocrine disorder in which pancreatic β cells stop producing insulin, typically due to autoimmune destruction. This results in hyperglycemia and ketosis; thus, insulin replacement is vital to management. Incidence peaks in puberty and early adulthood, but onset can occur at any age (Syed, 2022).

The prevalence of type 1 diabetes (T1D), one of the most prevalent chronic diseases in children and adolescents, is rising globally. A complicated daily self-management regimen is necessary for T1D, which includes frequent blood glucose testing, insulin balancing with physical activity, and carb counting (Jespersen et al., 2021). One in six people are aged 10–19 years. Adolescence is a unique and formative time (World Health Organization: WHO, 2024). Adolescence is recognized as a challenging time for patients with type 1 diabetes. Young people with type 1 diabetes endure a lifetime of monotonous and rigorous health care management usually involving daily blood glucose monitoring,

insulin injections and constant self-care, often resulting in psychological maladjustment. One of the most prevalent chronic diseases in children is type 1 diabetes (T1D), which needs to be carefully managed to preserve appropriate glycemic control and avoid long-term consequences (Rawdon et al., 2022). Due to varying degrees of immunological and metabolic dysfunction, age at diagnosis is a crucial clinical criterion that defines the pathophysiology, disease courses, and several cardiometabolic risk factors of type 1 diabetes. The presence of pancreatic β-cell auto-antibodies or their titers in adult-onset T1DM, as well as genetic load, can affect the rate and pattern of β-cell death during the course of T1DM in contrast to childhood-onset T1DM (Baek et al., 2020).

It is crucial to evaluate and improve knowledge and perceptions of chronic illnesses like type 1 diabetes because adolescence is a critical time for developing healthy habits. Given the increasing prevalence of diabetes and the critical role of education in disease prevention and management, it is imperative to evaluate the knowledge and perception of T1DM among adolescents in various academic disciplines. According to studies, teenagers who understand diabetes well are better able to control the illness, which improves their health (Naef et al., 2023). Given the importance of both knowledge and perception in diabetes management, this study aims to explore the extent of adolescents understanding and their attitudes towards T1DM, by identifying the gaps in knowledge and the factors that shape perceptions, this study will provide insights into how educational programs and interventions can be tailored to improve diabetes care and outcomes in this vulnerable age group.

### 1.1 Statement of research problem

The most prevalent chronic illness affecting children is type 1 diabetes mellitus, or T1DM. The condition is thought to affect 1.2 million children and adolescents between the ages of 0 and 19

worldwide, and there are 184,100 more new cases among this age group each year (IDF Diabetes Atlas, 2021). Children with type 1 diabetes frequently exhibit weight loss, polyuria, and polydipsia at diagnosis. Diabetic ketoacidosis is found in 10% to 70% of these children ((Stefanowicz-Bielska et al., 2022). The American Diabetic Association states that a child or adolescent is diagnosed with type 1 diabetes if their fasting blood glucose level is 126 mg/dL (7.0 mmol/L), their 2-hour plasma glucose level is 200 mg/dL (11.1 mmol/L) during an oral glucose tolerance test (OGTT), their HbA1C is 6.5 percent (48 mmol/mol), or they have random blood glucose of 200 mg/dL (11.1 mmol/L) in a patient exhibiting the typical symptoms of hyperglycemia or hyperglycaemic crisis (Association, 2021). Approximately 1.2 million children and adolescents worldwide suffer with type 1 diabetes, which is on the rise in the paediatric population. T cell-mediated death of insulin-producing pancreatic beta-cells is the result of its intricate pathophysiology, which combines environmental variables and genetic susceptibility. Hyperglycemia and insulin deficiency are the outcomes of this damage. Therefore, controlling type 1 diabetes necessitates a multifaceted strategy that includes elements like insulin therapy, blood glucose monitoring, carb counting, calorie intake tracking, taking into account dietary preferences and family customs, creating daily routines, and integrating physical activity (Lan et al., 2024).

Adolescents with type 1 diabetes face many daily obstacles related to managing the disease, including significant lifestyle changes requiring rigorous therapeutic exogenous insulin regimens, the requirement for dietary restrictions, consistent exercise, and frequent biochemical marker monitoring. The physical, social, academic, and emotional functioning of adolescents with type 1 diabetes comprise their health-related quality of life (HRQoL). Adolescents in particular are known to have unique needs based on the significant developmental changes that occur during this transitional period of life. Factors such as age, sex, family income, length of sickness, degree of illness knowledge, presence or lack of biochemical disease control, and adolescent lifestyle are known to influence and be influenced by it. It emphasises

how health status affects quality of life and goes beyond simple indicators of population health, life expectancy, and cause of death (Bekele et al., 2022). It has been demonstrated that disease perceptions—which include people's views and comprehension of their condition—have a major impact on how T1D is managed in adolescents. Unfavourable opinions could make people reluctant to practise necessary self-care practices, which could raise the risk of problems and cause blood sugar levels to fluctuate. Additionally, these beliefs can discourage people from getting the healthcare they need, which would make management more difficult and raise the risk of negative health consequences (Akbari et al., 2022).

Adolescents in tertiary institutions represent a critical group for interventions due to their evolving cognitive capabilities, increasing independence, and exposure to diverse social influences. However, research remains limited regarding their perception of T1DM and their readiness to manage the condition effectively (Naef et al., 2023). Recent studies highlight the need for tailored educational approaches to improve their disease knowledge and self-management skills, fostering better long-term outcomes (Katz et al., 2020). This study seeks to explore the knowledge and perception of T1DM among adolescents in a tertiary institution, identifying level of knowledge, perception and barriers to effective management of diabetes mellitus. By understanding these dynamics, healthcare providers can design targeted interventions to enhance health literacy and empower adolescents to make informed decisions about their health. Addressing these gaps is essential to improving adherence to treatment, reducing the risk of complications, and enhancing the overall quality of life for adolescents living with T1DM.

## 1.2 Objective of the study

The main aim of this study is to evaluate the knowledge and perception of type 1 diabetes mellitus among adolescents in selected departments of the Faculty of Art, University of Benin.

The specific objectives of this study are;

- To assess the level of knowledge on Type 1 diabetes mellitus among adolescents in the Faculty of Art, University of Benin.
- To assess the level of perception of Type 1 diabetes among adolescents in the Faculty of Art, University of Benin.

## 1.3 Research Questions

- What is the level of knowledge about type 1 Diabetes mellitus among adolescents in the Faculty of Art, University of Benin?
- What is the level of perception of type 1 Diabetes mellitus among adolescents in the Faculty of Art, University of Benin?

## 1.4 Research Hypothesis

The hypotheses for this study are as follows:

- **Null Hypothesis ($H_0$):** There is no significant relationship between the level of knowledge about Type 1 diabetes mellitus and the perception of its management among adolescents in a tertiary institution.
- **Null Hypothesis ($H_0$):** There is no significant difference in the knowledge and perception of Type 1 diabetes mellitus between male and female adolescents in a tertiary institution.

### 1.5 Significance of the Study

The findings from this study will equip the health institutions, government, non-governmental organizations and other stakeholders in the health sectors to utilize the strategies to improve the knowledge of adolescents about type 1 diabetes. This study will help the young diabetic patient to understand the concept of self-management of diabetes. The finding of this study will be of immense benefit to the nursing profession in providing useful information on type 1 diabetes, self-management of diabetes and the barriers to management of diabetes. This study will also identify ways in which society can provide support to adolescents living with diabetes in achieving self-management of diabetes.

### 1.6 Scope of study

This study will focus on the knowledge and perception of Type 1 Diabetes mellitus among adolescents. The study will be conducted in the University of Benin which is a top populated tertiary institution and is well suited for the purpose of this study.

### 1.7 Operational definition of terms

**Diabetes:** Diabetes is a chronic, metabolic disease characterized by elevated levels of blood sugar.

**Type 1 diabetes:** A chronic condition in which the pancreas produces little or no insulin.

**Knowledge:** This is the fact or condition of knowing something with familiarity gained through experience or association.

**Perception:** It is referred to as the way in which individuals interpret or become aware of their surroundings and experiences.

**Adolescent:** It can be defined as a phase of life between childhood and adulthood, from ages 16 to 19.

**Prevention:** This term refers to actions, strategies, or measures taken to stop something undesirable from occurring or to reduce the risk of it happening.

# CHAPTER TWO

# LITERATURE REVIEW

This chapter explores related literature under the following headings; conceptual review, theoretical and empirical studies. This review synthesizes conceptual and empirical studies from 2020 to 2024 on the knowledge and perception of Type 1 Diabetes mellitus among adolescents. It also focuses on the causes and preventive measures of Type 1 Diabetes mellitus among adolescents.

## 2.1 Conceptual Review

### 2.1.1 Type 1 Diabetes Mellitus: Pathogenesis, Pathophysiology and Causes

Globally, type 1 diabetes mellitus (T1DM) is one of the most significant public health issues. It is characterised by the destruction of β-cells, typically due to an autoimmune process, which results in a decrease in the synthesis of endogenous insulin (Chatzistougianni et al., 2020). The term “diabetes mellitus” describes a complex metabolic disorder characterized by chronic hyperglycemia resulting from defects in insulin secretion, insulin action, or both. Protein, lipid, and carbohydrate metabolism problems are caused by insufficient insulin action on target tissues, which is caused by inadequate insulin secretion and/or decreased tissue responses to insulin. A person may have both inadequate insulin action and impaired insulin secretion (Libman et al., 2022).

Diabetes follows a progressive pattern with complex pathogenesis and varied presentation (Sameer et al., 2020). Chronic immune-mediated death of pancreatic β-cells is a hallmark of type 1 diabetes (T1D), which results in partial or, most often, complete insulin insufficiency. Most of the time, autoimmune-mediated pancreatic β-cell loss happens at a varied rate and is impacted by a variety of factors, such as age, ethnicity, and heredity. According to recent research on young people at risk for T1D, early illness is a continuum that advances through discrete, recognizable stages before clinical symptoms manifest. Young people go through three stages at different rates: stage 1 is marked by β-cell autoimmunity with normoglycemia and no clinical symptoms; stage 2 is marked by dysglycemia but no symptoms; and stage 3 is the beginning of symptomatic disease (Libman et al., 2022). Type 1 diabetes mellitus (T1DM), sometimes referred to as type 1A DM, juvenile-onset diabetes, or insulin-dependent diabetes mellitus (IDDM) in earlier nomenclature, accounts for 5–10% of all occurrences of diabetes. T-cell-mediated death of pancreatic β-cells is a hallmark of this autoimmune disease, leading to insulin insufficiency and, eventually, hyperglycemia. Although the exact pathophysiology of this autoimmunity is yet unknown, it has been discovered that both hereditary and environmental factors have a role. The development of this pancreatic β-cell-specific autoimmunity and the illness itself can occur gradually in adults (late onset) or quickly in most cases, as in infants and children (juvenile onset) (Sameer et al., 2020).

T1D is caused by the adaptive immune system destroying the beta cells, which are the cells in the pancreas that produce insulin. An unrecognised interplay between an individual's environment and genetic makeup drives this process. About 90% of T1D patients have genetic factors (i.e., overexpression of human leukocyte antigen or HLA class molecules DR4, DQ8, and DQ2 increases susceptibility) and one or more environmental factors that cause beta cell components to be recognised as autoantigens that the immune system mistakenly interprets as foreign, resulting in an autoimmune

attack. Insulin B chain peptide (11-23) and other elements of beta cell secretory granules, such as transmembrane zinc transporter, glutamic acid decarboxylase 65, and protein phosphatase-like IA-2, have been identified as autoantigens. A significant risk of T1D is conferred by the presence of one recognised autoantibody, however the risk grows exponentially with each subsequent autoantibody (Giwa et al., 2020). T1D has a complex aetiology, however it is still unknown how exactly genetic predisposition, environmental variables, the immune system, and β-cells contribute to the pathogenic mechanisms that underlie the disease (Libman et al., 2022).

Variability in the rate of immune-mediated loss of pancreatic β-cells frequently determines how the disease will ultimately progress. Some children and adolescents experience abrupt β-cell loss and subsequent failure, which can result in diabetic ketoacidosis (DKA), which is frequently referred to as the disease's initial presentation. Others have very gradual disease progression with moderate elevations in fasting blood glucose levels, which only become severe hyperglycemic with or without ketoacidosis when there are physiological stressors such severe illnesses or the beginning of other ailments. There are some situations, such as adults, where β-cells may still be able to secrete just enough insulin to keep people from developing ketoacidosis for years. However, these people develop severe hyperglycemia and ketoacidosis as a result of gradual insulin insufficiency, which makes them insulin-dependent. Although the course of this form of diabetes varies, those who are affected in the early, middle, or even later stages of life become severely or completely insulin-deficient and require insulin treatment to survive. Regardless of when it occurs, this severe or complete insulin insufficiency shows up as low or undetectable levels of plasma C-peptide (Sameer et al., 2020).

This process also involves a complex interplay of genetic predisposition, environmental factors, and immune-mediated mechanisms. Genetic susceptibility plays a significant role in T1DM development. Specific human leukocyte antigen (HLA) class II alleles, particularly HLA-DR and HLA-DQ, are

strongly associated with increased risk. Additionally, over 70 non-HLA genes have been implicated in T1DM pathogenesis, influencing immune regulation and β-cell function (Yahaya & Salisu, 2021). Environmental factors are believed to initiate or accelerate the autoimmune process in genetically predisposed individuals. Viral infections, such as those caused by enteroviruses, have been studied for their potential role in triggering autoimmunity leading to β-cell destruction (Mittal et al., 2024).

### 2.1.2 Epidemiology

One of the most important global public health concerns is Type 1 Diabetes Mellitus (T1DM), an epidemic that is only getting worse and becoming more and more common worldwide. The most prevalent kind of diabetes in kids and teenagers is type 1 diabetes. In most parts of the world, the rise in diabetes prevalence has coincided with fast economic growth, which has resulted in urbanization and the adoption of contemporary lifestyles (Sameer et al., 2020). T1DM affects 1,211,900 children and adolescents under the age of 20 worldwide (Ogle et al., 2021). The number of children and adolescents (0–19 years old) with type 1 diabetes is estimated to have increased to 1,110,100, and the number of new cases annually to 128,900. Over the past few decades, many countries have seen an increase in the disease's incidence, particularly in children and adolescents under the age of fifteen, with an overall annual increase of about three percent (Chatzistougianni et al., 2020).

Type 1 Diabetes Mellitus (T1DM) is a chronic autoimmune disorder that primarily manifests in childhood and adolescence, leading to lifelong dependence on insulin therapy (International Diabetes Federation [IDF], 2021). Over the past few decades, the prevalence of type 1 diabetes has been rising globally; estimates suggest that 1.2 million children and adolescents under the age of 19 have the disease (IDF, 2021). While Asia and Africa often have lower recorded incidence rates, Europe and North America have some of the highest rates of T1DM. The incidence of the disease varies greatly among populations and geographical areas. In many nations, the prevalence of type 1 diabetes in

children and adolescents has been rising at an annual rate of 2% to 4% (Mobasseri et al., 2020). According to recent studies, the prevalence of type 1 diabetes is rising not only in high-income nations but also in low- and middle-income ones, where healthcare systems may not be as prepared to effectively manage the condition (Sun et al., 2021). Moreover, a systematic review by the Institute for Health Metrics and Evaluation (IHME, 2023) projected that the global prevalence of diabetes, including both Type 1 and Type 2, could reach 1.3 billion by 2050. This growing prevalence underscores the need for enhanced early detection and improved management strategies for adolescents living with T1DM.

### 2.1.3 Knowledge of Type 1 Diabetes Mellitus Amongst Adolescents

According to studies, while adolescents are generally aware of diabetes, their knowledge of Type 1 diabetes is often limited, with significant gaps in understanding key aspects such as its autoimmune nature, proper management techniques such as insulin dosage and blood sugar monitoring, and potential complications, particularly carbohydrate counting and hypoglycemic management. Knowledge is essential for sustaining patient glycemic control and adherence to medication. Poor glycemic control, limited treatment adherence, and significant psychological adjustment to disease could come from incorrect or lack of awareness about diabetes risk (Aldossary & Snelgrove, 2020).

Diabetes mellitus can be diagnosed early in life, allowing for the reduction of diabetes-related life-threatening consequences. To prevent the rising trend of increasing young diabetic patients, it is vital to understand how much awareness exists among people, particularly youngsters, about various aspects such as lifestyle modification, dietary adjustments, treatment, medication adherence, physical activity, and so on. Poor compliance stems from a lack of accurate perceptions of the condition (Akter et al., 2022)

Knowledge of type 1 diabetes among adolescents is affected by various demographic factors. According to Akter et al. (2022), socioeconomic factors, societal practices, and behavioural patterns were found to have an influence on diabetes knowledge, attitude, and practice. Access to education from healthcare providers, family members with diabetes, peer influence, school-based health programs, internet access, personal experience with the disease, family support, socio-economic status, age, and the level of engagement in diabetes management discussions with healthcare professionals are all factors that contribute to an adolescent's knowledge of type 1 diabetes. Better knowledge often correlates with improved self-management practices (Owusu et al., 2022).

Access to Diabetes Self-Management Education (DSME) is limited in resource-poor regions such as Ghana and Nigeria. Despite its inclusion in current public health protocols, DSME is not widely available in these countries, reducing possibilities for young people to learn how to manage their diabetes effectively. While some young people may compensate for a lack of DSME by learning about their disease from the internet or acquaintances in other countries, many do not now have access to the necessary education (Owusu et al., 2022b). According to Azar et al. (2024), Potential barriers contributing to limited knowledge of type 1 diabetes among adolescents include: lack of age-appropriate education, social stigma associated with the disease, peer pressure, developmental stage impacting understanding of complex medical concepts, inadequate support from family or healthcare providers, concerns about self-image, fear of complications, and a lack of awareness about the disease within their social circles; all of which can hinder their ability to effectively manage their condition.

### 2.1.4 Perceived Risk Factors

Research shows that risk behaviors in adolescents with type 1 diabetes can have a negative impact on health outcomes, and that adolescents frequently lack understanding and/or misunderstanding of their personal risk related to alcohol consumption, cigarette smoking, illicit drug use, unprotected sex, and

disordered eating behaviors (Chu et al., 2023). Genetic factors continue to be a major risk factor for T1D. Adolescents with a family history of T1D, especially those with specific HLA genotypes, are more likely to develop the condition, according to studies. Although genetic predisposition is frequently thought to be the major cause, environmental factors also play a role in its manifestation (Wasserman et al., 2022). Environmental variables, including viral infections (e.g., enteroviruses), are linked to T1D in genetically vulnerable adolescents. Research indicates that infections may speed up beta-cell breakdown, which is supported by seasonal patterns in T1D onset worldwide (Ward et al., 2022).

Early childhood diet (e.g., absence of breastfeeding or early introduction of cow's milk) and vitamin D insufficiency are thought to increase the incidence of type 1 diabetes. Pre-adolescent exposures may lead to autoimmune reactions during adolescence (Rossini et al., 2023). Research indicates that shorter nursing periods or early introduction of cow's milk-based formula may raise the incidence of T1D. Certain proteins in cow's milk, such as beta-casein, may cause an immunological reaction in genetically sensitive individuals, resulting in damage to pancreatic beta cells over time. Subclinical impairment may persist until puberty, when T1D is commonly diagnosed (Inshaw et al., 2021). Vitamin D deficiency in childhood is linked to an increased risk of T1D due to its immune regulatory function. Insufficient vitamin D can weaken immunological tolerance and increase the risk of autoimmunity against beta cells. This risk factor is particularly relevant as its effects may accumulate, contributing to T1D onset in adolescence.

Emerging evidence links chronic stress and adverse childhood experiences to T1D risk. Adolescents exposed to prolonged stress may experience immune system dysregulation, increasing susceptibility to autoimmune conditions like T1D. This factor is gaining attention as a modifiable risk element. (McDonough et al., 2024). While traditionally associated with type 2 diabetes, obesity is now

perceived as a potential accelerator of T1D in adolescents. Excess body weight may exacerbate insulin resistance, complicating the autoimmune process in genetically at-risk individuals (D'Souza et al., 2023).

### 2.1.5 Impact of Knowledge And Perception In The Management Of Diabetes Mellitus Amongst Adolescents

Adolescents' knowledge and perspective of Type 1 Diabetes Mellitus (T1DM) have a substantial impact on how they manage the condition. Adolescents with T1DM frequently encounter particular problems, such as rigorous glycemic control, adherence to insulin therapy, and lifestyle changes. Research shows that higher knowledge and positive opinions of diabetes management are connected with better health outcomes and adherence to treatment regimens. Adolescents who understand T1DM can make more informed decisions about their food, physical activity, and insulin delivery. Paraszczuk et al. (2021) discovered that adolescents with higher diabetes knowledge ratings had considerably better glycemic control (HbA1c values) than those with lower knowledge scores. This emphasizes the necessity of diabetes education programs designed for adolescents, which can boost their understanding of the condition and its care. Knowledge enables adolescents to take control of their situation. Adolescents who are familiar with T1DM are more likely to engage in self-care activities, such as regular blood glucose monitoring and adherence to insulin medication (Hagger et al., 2020). Furthermore, understanding the illness etiology, symptoms of hypo- and hyperglycemia, and the significance of regular monitoring empowers teenagers to take control of their health, which is critical during this developmental era (Distaso et al., 2022). Diabetes education programs tailored to the adolescent age group have been shown to improve knowledge retention and enhance self-management behaviors. These interactive, age-appropriate educational interventions were found to increase knowledge and boost confidence in adolescents' ability to manage their diabetes (Owusu et al., 2022).

Perception refers to how adolescents perceive their condition and its treatment. It includes their attitudes, beliefs, and emotional responses to living with type 1 diabetes. Perception has a substantial impact on adolescents' motivation to stick to treatment plans and their capacity to deal with the obstacles of diabetes care. Adolescents who see their condition as manageable and integral to their identity are more likely to engage in healthy behaviors and feel empowered in their self-care routines (Roy-Lavallee et al., 2020) In contrast, negative perspectives, such as seeing diabetes as a burden or a barrier to normal living, might contribute to poor adherence and suboptimal glycemic management. Additionally, adolescents who viewed diabetes management as overwhelming or restrictive were more likely to experience diabetes distress, a condition characterized by feelings of frustration, guilt, and burnout related to diabetes care (Hagger et al. (2020). According to research, adolescents' perceptions of the emotional and social burdens of T1D have a substantial impact on their management. For example, those who face stigma or feel different from their friends as a result of their condition may oppose management strategies such as insulin injections or dietary restrictions (Parsons et al., 2023). This resistance can originate from a fear of being judged or a desire to fit in, especially throughout adolescence, which is characterized by increased social awareness. Adolescents who perceive favorable family support are more likely to seek help when they need it and stick to prescribed regimens. In contrast, a perceived lack of support may cause feelings of isolation, aggravating the psychological burden and contributing to poor diabetes treatment (Ramon et al., 2021).

Knowledge and perception are intricately linked and mutually reinforcing. Adolescents who are aware about T1DM are more likely to have positive attitudes toward their condition because they understand the need for self-care and the implications of poor treatment. Positive perceptions, on the other hand, can encourage adolescents to seek information and participate in educational activities. Adolescents who took part in structured diabetes education programs not only increased their knowledge, but also had

more favorable attitudes regarding diabetes management. This emphasizes the significance of including educational and psychological support into diabetes care in order to address both knowledge and perception (Paraszczuk et al., 2021).

## 2.2 Theoretical Review

The theoretical framework for this study was the Health Belief Model (HBM).

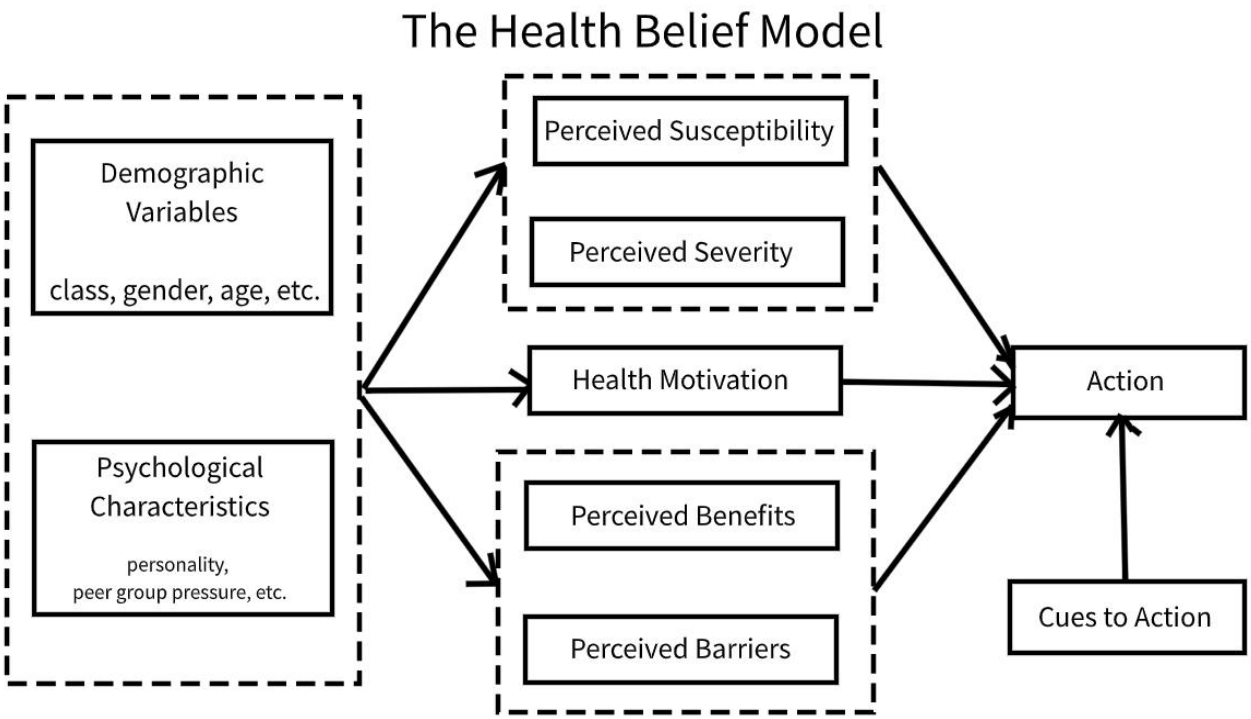

**Figure 2.1. Historical origins of health belief model (Rosenstocks & Irwin 1974)**

The health belief model (HBM) is a basic framework for health behavior research. It was developed in the 1950s by social psychologists working for the United States Public Health Service (USPHS) to better understand preventative health behavior, specifically "the widespread failure of people to accept disease preventatives or screening tests for the early detection of asymptomatic disease." The model focuses on how individuals perceive health concerns and decide to respond based on the value individuals place on a particular goal and the chance that actions made toward that goal will be successful in reaching the objective (Alyafei & Easton-Carr, 2024)..

It is made up of six main cognitive constructs, or "dimensions" that drive behavior: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy, and cues to action

**Perceived susceptibility:** determining the likelihood of contracting an illness or experiencing a negative consequence

**Perceived severity:** comprehending the severity of the illness, condition, or undesirable outcome, as well as what might happen if no further action is taken. There is a wide variety in how people perceive

the severity of an illness, and they frequently incorporate both medical and social aspects when determining its severity.

**Perceived benefits:** how people view the effectiveness of various alternatives to minimize the risk of sickness.

**Perceived barriers:** barriers to carrying out a recommended health action that may prevent someone from doing so.

**Self-efficacy:** refers to an individual's belief in their ability to accomplish a given action or task well. It also influences a person's likelihood of engaging in a desired behavior.

**Cues to action:** might come from either one's surroundings or subjective sensations. Specific cues can impact the activities we choose to do. Cues to action, which have received less attention, are the stimuli that trigger the decision-making process to implement a recommended health intervention. These cues might be internal or external, such as seeing symptoms of an illness or being exposed to a health promotion (Boskey, 2024).

### 2.2.1 Strengths of the Health Belief Model:

- The HBM's clear constructs make it easy for academics and practitioners to utilize in health promotion initiatives..
- The model emphasizes the significance of an individual's subjective perceptions about a health hazard (perceived susceptibility and severity) and the potential rewards of taking action (perceived benefits), both of which can be critical in understanding behavior change (Boskey, 2024).
- The HBM can be applied to a wide range of health behaviors, from preventative screenings to medication adherence, by adjusting the specific health threat and potential actions involved ( Daniati et al., 2021.)

- The concept of "perceived barriers" enables researchers to identify difficulties that hinder individuals from adopting healthy behaviors, which may then be addressed in interventions.

### 2.2.2 Weaknesses of Health Belief Model

- While the HBM can explain some health behaviors, it may not accurately anticipate complex behaviors impacted by social norms, environmental circumstances, or emotional states (Alyafei & Easton-Carr, 2024).
- The HBM is primarily concerned with individual beliefs and does not effectively account for the effects of social influences, cultural norms, or socioeconomic variables on health behavior (Alyafei & Easton-Carr, 2024).
- The model may not explicitly explain how the many constructs interact with one another, making it impossible to determine the relative contribution of each element to behavior change (Daniati et al., 2021)
- The HBM's concentration on cognitive characteristics may fail to account for emotional factors or the complicated decision-making processes involved in health behavior change (Alyafei & Easton-Carr, 2024).
- The HBM does not provide specific instructions on how to effectively influence people's perceptions in order to encourage behavior change.

### 2.2.3 Application to the Study

The Health Belief Model is a psychological model that focuses on how people perceive their health risks and the advantages of taking preventive measures in an effort to explain and forecast health-related behaviors.

**Perceived susceptibility**: The incidence of Type 1 diabetes in their family or community may have an impact on adolescents' perceptions of their vulnerability to the disease. They can underestimate their risk if they don't know that Type 1 diabetes is an autoimmune condition that usually appears in childhood or adolescence. They may believe that Type 1 diabetes is uncommon or unlikely to harm them as a result of inadequate health education. A study by Alburno et al. (2022) on socio-cognitive factors of insulin adherence in teenagers with T1D discovered that perceived sensitivity to complications (e.g., hypoglycemia) influenced adherence behaviours.

**Perceived severity:** Adolescents may underestimate the severity of Type 1 diabetes because they are unfamiliar with the long-term health effects, which include kidney failure, blindness, and neuropathy. This lack of understanding might lead to complacency in terms of self-care and preventing issues. Zahed et al. (2023) study on patient perceptions about using technology to control diabetes found that higher perceived severity of T1D was associated with increased desire to use self-management tools.

**Perceived benefits:** adolescents who have been informed on Type 1 diabetes may understand the perceived benefits of managing the disease (such as enhanced quality of life, lifespan, and the prevention of complications). Adolescents who understand the benefits of regular blood sugar monitoring and insulin management may be more inclined to adopt healthy behaviours. Otovwe et al., (2022) used the HBM to investigate diabetes perceptions among Nigerian secondary school students. discovered that individuals who recognised benefits in understanding diabetes (e.g., assisting others) had higher attitudes towards prevention and management.

**Perceived barrier:** Adolescents in the Faculty of Arts at the University of Benin may face significant barriers to effectively managing Type 1 diabetes, including access to healthcare, the cost of insulin, and a lack of awareness about the disease. Stigma and misconceptions about the condition may also prevent students from seeking medical advice or taking appropriate preventive measures. Chu et al. (2023)

discovered that teenagers who were overweight or obese underestimated their diabetes risk due to factors such as low awareness and health literacy.

**Cues to action:** they trigger that encourage individuals to engage in healthy behaviors. In the case of Type 1 diabetes, this might include educational campaigns, seeing someone else manage the condition effectively, or personal experiences with the symptoms of the disease. A quantitative study by Du et al. (2024) on health seeking behaviour in type 2 diabetes patients in China found that external cues (e.g., family encouragement) boosted awareness and action.

**Self-Efficacy:** refers to an individual's belief in their ability to properly manage health behaviours. Adolescents who are confident in their abilities to control Type 1 diabetes are more likely to follow the essential steps, such as blood glucose monitoring and insulin delivery. This is determined by their level of education and the assistance they receive from peers, family, and healthcare providers. Alburno et al. (2022) emphasised that self efficacy in managing T1D (e.g., insulin use) was critical for adolescents' adherence, implying that confidence in health knowledge influences behaviour.

## 2.3 Empirical Review

### 2.3.1 Knowledge Of Type 1 Diabetes Among Adolescents

Adolescents' knowledge of T1D is a key determinant of their ability to manage the condition effectively. According to a cross-sectional research conducted by Mishriky et al. (2022), only 58% of teenagers with T1D could appropriately characterize hypoglycemia, and less than 40% comprehended the long-term consequences of poorly controlled diabetes. This lack of information was linked to lower glycemic control and more hospitalizations. Similarly, Naef et al. (2024) conducted a qualitative research on how adolescents aged 14 to 18 years old with T1D in Germany perceive digital health

treatments. The study found that while many adolescents had basic knowledge of T1D (e.g., insulin and glucose monitoring), there were significant gaps in understanding advanced management strategies like interpreting CGM data and managing hypoglycemia during physical activity. Participants highlighted a need for personalized digital solutions to overcome knowledge gaps, indicating that insufficient educational delivery may be the root cause, not apathy.

However, a study conducted by Aldossary and Snelgrove (2020) to explore knowledge and understanding of Type 1 diabetes and its management among children in Saudi Arabia indicated that children and young people know the aggravating factors and the theoretical aspects of T1DM management but fail to adhere to the treatment regimen practically. Also Pironetti et al. (2023) conducted a survey in Finland among adolescents with T1D and their parents, reporting a mean DKS score of 63.2%. Adolescents demonstrated adequate knowledge of monitoring glucose levels (72.3% accuracy), but scored lower on symptom recognition (55.8%), indicating gaps in understanding acute complications like diabetic ketoacidosis (DKA). The study found that knowledge correlated positively with glycemic control (HbA1c levels). In another cross-sectional research study by Zemba et al. (2023) conducted in Burkina Faso to assess T1D knowledge among adolescents and young adults aged 10-30 years, using the validated Diabetes Knowledge and Skills (DKS) questionnaire. The study found that 60.32% of participants had only primary or intermediate education. Their average knowledge score was moderate, with strengths in general diabetes awareness (e.g., recognizing it as a chronic condition) and weaknesses in insulin management and hypoglycemia prevention thus limited access to formal diabetes education may impede thorough knowledge development.

Agofure and Oghenerume (2022) conducted a cross-sectional research among 400 randomly selected students from junior secondary school 1 to senior secondary school 2 in Nigeria to evaluate knowledge about diabetes mellitus (including T1D) among secondary school students, some of whom had T1D. The

study found that 88% of respondents were aware of diabetes, but only 3.4% had a thorough understanding of its origins, symptoms, risk factors, and consequences. This showed that adolescents with T1D had marginally more awareness than their classmates, maybe due to personal experience, but overall knowledge remained low. Orok et al. (2024) performed a cross-sectional study of 349 university undergraduates in southern Nigeria to examine their knowledge, attitude, and perceived hazards linked to diabetes mellitus. The results showed that 25.2% had good knowledge and 92.3% were aware of DM. Positive attitudes and perceived risks were indicated by all students. Diabetes knowledge was substantially linked with information sources, family history, degree of education, and age. Another cross-sectional research done by Mohammad et al. (2020) to measure knowledge and self-efficacy among children with type 1 diabetes found that only 38.7% of the children investigated had sufficient general knowledge of diabetes. In terms of self-efficacy, the results showed that 51.9% of children had extremely low self-efficacy for diabetes care, whereas 12.3% had strong self-efficacy.

Socioeconomic status (SES) and cultural context significantly influence T1D knowledge. According to Cveticanin and Arsenovic's (2025) review of predictive models for diabetes in children and adolescents, low-SES settings (e.g., parts of the U.S. and India) have significant knowledge deficits due to limited access to healthcare resources and education, while adolescents from higher SES backgrounds have a better understanding of T1D risk factors and management strategies. Digital health interventions have emerged as a promising tool for increasing T1D awareness. A research by Olinder et al. (2022) as part of the ISPAD Clinical Practice Consensus Guidelines, highlighted the need for diabetes education for adolescents with T1D. Based on global research, the guidelines suggest that education suited to developmental phases leads to better information retention and favorable attitudes towards self-care. The study found that interactive, peer-supported learning was more effective than didactic techniques in promoting perceptual modifications, such as perceiving T1D as manageable rather than stressful.

However, Naef et al. (2024) conducted a systematic review of digital interventions for adolescents with T1D and found that mobile apps and online platforms improved knowledge of self-management practices, including insulin dose adjustment, with a 15% increase post-intervention. However, engagement varied, with younger adolescents (10–14 years) showing less consistent use than older peers (15–19 years), suggesting age-specific design considerations.

### 2.3.2 Perception of Type 1 Diabetes Among Adolescents

Adolescents' perceptions of T1D have a substantial impact on their self-management and emotional well-being. Jonker et al. (2020) did qualitative research in South Africa on teenagers with well-controlled type 1 diabetes. The study identified four main illness perception themes: T1D as a way of life, feeling different due to management demands, being aware of potential complications, and believing in manageability. Fear of complications drove adherence to treatment protocols, resulting in effective self-management. However, the study's focus on well-controlled cases limits its generalizability to adolescents with poorer glycemic control, who may perceive T1D more negatively. However, Cveticanin and Arsenovic's 2024 study examined diabetes prediction models in children and adolescents, focusing on risk knowledge to indirectly address perceptions. The study found that healthcare practitioners and patients often had different conceptions of T1D risk, such as genetic predisposition or severe insulin shortage, however it did not specifically focus on teenagers' perspectives. Adolescents may underestimate long-term hazards due to absence of visible symptoms in the early stages, revealing a gap between clinical knowledge and personal perception.

Katz et al. (2020) conducted interviews with U.S. adolescents with T1D and their parents to assess long-term complications. Adolescents with T1D felt both anxious about their future health and frustrated with

its immediate demands, such as insulin injections. They desired factual, prevention-focused discussions from providers, indicating a perception of T1D as a manageable yet persistent challenge.

Emotional responses to T1D are crucial. Taraban et al. (2022) performed semi-structured interviews with 23 U.S. children with T1D and identified four worry-related themes: controlling blood glucose, self-efficacy, interpersonal connections, and lifestyle effect. Adolescents with T1D reported feeling overwhelmed and ostracized, leading to social isolation owing to a lack of understanding from peers. Williams et al. (2023) conducted focus groups in South Africa to study the impact of continuous glucose monitoring (CGM) on teenagers' perception. Participants first regarded T1D adversely because of its visibility (e.g., wearing gadgets), but CGM helped them feel empowered, reduce embarrassment, and gain control. Deacon (2023) found that South African teenagers in private healthcare perceive T1D as both a difficulty and a source of resilience. Higher socioeconomic level increased access to resources, leading to a "smile with diabetes" attitude. However, emotional problems continued.

Adolescence represents a shift toward self-management, which influences T1D beliefs. In a study of Latino teenagers with T1D and poor English proficiency in the United States, Joiner et al. (2020) discovered that they saw T1D as a personal responsibility that grew with age. Language obstacles and cultural expectations, such as family participation, hindered the transition, resulting in sentiments of both autonomy and reliance. Naef et al. (2023) found that adopting digital treatments, such as apps or CGM, improved teenagers' perceptions of T1D and increased independence. Younger teenagers (10-14 years) felt less secure and saw T1D as a challenging duty compared to their older counterparts.

Illness perception has a direct influence on T1D management. Allen et al. (2024) studied the views of adolescents in Canada throughout time. The Brief Illness Perception Questionnaire revealed that considering T1D as manageable and intelligible led to improved glycemic control (HbA1c < 7.5%), but

emotional distress predicted poorer results. Ostrominski et al. (2025) analyzed trial data from different nations and found that teenagers who saw T1D as a serious but controllable disease were more likely to adhere to therapy (78% vs. 52%). This view was connected to education on complications.

Perceptions are influenced by peer and family relationships. In a study conducted in Ghana using photovoice and interviews, Owusu et al. (2023) discovered that while teenagers regarded T1D as a social barrier owing to peer taunting, family support reframed it as a community obligation. Positive family tales can lessen emotions of estrangement. Similarly, a study conducted by Mann et al. (2025) on early continuous glucose monitor use in children and adolescents with Type 1 diabetes found that teenagers assessed T1D less adversely when parents demonstrated proactive treatment. Peer acceptance of CGM devices increased a sense of normality. Recent research has highlighted shifting perspectives. According to Zhang et al.'s (2025) bibliometric investigation, adolescents see T1D via a technology lens, with tools such as gamified applications helping to reduce fear and increase knowledge.

### 2.4 Summary of Review of Literature

Type 1 diabetes is a chronic autoimmune disease where the body's immune system mistakenly attacks and destroys the insulin-producing cells (beta cells) in the pancreas, leading to a lack of insulin and high blood sugar levels.

the literature review provides a comprehensive examination of concept type 1 diabetes mellitus among adolescents including their knowledge and perception of the disease. The review began with a conceptual exploration of type 1 diabetes mellitus, its pathogenesis, pathophysiology and its causes and then proceeded to talk about the epidemiology. T1DM affects 1,211,900 children and adolescents under the age of 20 worldwide, with an estimated increase of about 128,900 annually. Furthermore, the conceptual review also ellaborated on the knowledge of type 1 diabetes amongst adolescents.while

adolescents are generally aware of diabetes, their knowledge of type 1 diabetes is often limited and this gap in knowledge is affected by various including demographic data, socioeconomic factors, societal practices and behavioural patterns. It also went further to talk about the perceived risk factors of type 1 diabetes mellitus among adolescents which highlighted the impact of perception on the general health outcome of the disease.

This is followed by theoretical review and framework and delves into the theoretical underpins of health belief model, its strengths and weaknesses and its application to the study. The empirical review examines existing researches on the knowledge of type 1 diabetes among adolescents which is a key determinant of their ability to manage the condition and also the perception of type 1 diabetes among adolescents which also have a substantial impact on their self management and emotional well being.

Despite the comprehensive nature of the literature review, a significant gap exists in the emperical research. The literature does not critically assess whether there are gender-based differences in knowledge levels, perceptions, or emotional responses to T1D. Hence there is need for studies that examines gender based differences in knowledge, perception and emotional response to type 1 diabetes mellitus

# CHAPTER THREE

# RESEARCH METHODOLOGY

This chapter outlines the research methodology employed in conducting the study. Each aspect of the research methodology will be discussed in the corresponding subsections, covering topics such as research design, research setting, target population, sampling technique, validity of instructions, reliability testing, data collection methods, data analysis, and ethical considerations.

## 3.1 Research Design

McCombes (2022) explains that a research design "is a strategy for answering your research question using empirical data" and includes selecting methods for data collection and analysis in a way that aligns with the research aims. It involves structuring the study in a way that ensures valid, reliable, and unbiased answers to the research questions by integrating the study components like methodology, data collection, and analysis. For this study, a descriptive cross-sectional survey design was employed. A descriptive cross-sectional study is a type of observational research method used to collect data from a population at a single point in time. It aims to describe the prevalence or characteristics of a specific outcome or condition within that population, without establishing cause-and-effect relationships. This design was appropriate as it allows for the collection of data at a single point in time from a sample that represents the larger population of the students

## 3.2 Research Setting

The research setting, as defined by Koswara (2022) and Trondle et al. (2021), encompasses the physical, social, and cultural environment in which data collection occurs within a study. The setting for this study was at the Faculty of Arts, University of Benin. University of Benin was founded in 1970. It started as an Institute of Technology and was accorded the status of full-fledged University by National

Universities Commission (NUC) on 1st July, 1971. Faculty of Arts is one of the existing faculties in the Institution made up of nine department of different areas of studies which are; English and Literature, Linguistic studies, Foreign Languages, Music, Philosophy, Religion studies, History and International studies, Mass communication and lastly department of Theatre Arts.. The selection of this research setting was deliberate, well suited for the study's objectives based on the diverse student population, age group and their level of knowledge of medical conditions. This research was carried out specifically in 4 out of the 9 departments of the Faculty of Arts, University of Benin, Benin City.

### 3.3 Target Population

The target population is a group of people or items about which researchers wish to make broad generalizations (Rahman et al., 2022). The study population for this research consisted of 100 to 300 level undergraduate students admitted to selected departments of the Faculty of Arts within the institution. Target population is 1742

### 3.4 Sample Size

Sample is a proportion of a population which also refers to the number of subjects or participants recruited and to which the study findings will be generalized. The sample for the study consisted of adolescents students in the age group of 16 to 19 years.

The formula is given by:

$n= N/[1+N (e)^2]$

where:

- n = sample size

- N = population size
- e = margin of error (expressed as a decimal 0.05)

In order to achieve a 95% confidence level in population size chosen, Yamane (2019) provided a simplified formula to calculate sample sizes. This formula was used to calculate the sample sizes in. A 95% confidence level and P =0.05 are assumed.

$n = N / [1 + N (e)^2]$

Where n is the sample size, N is the population size, and e is the level of precision.

| Department | Number of male students (100level-300level) | Number of female students (100level-300level) |
|---|---|---|
| History and international studies | 346 | 701 |
| English and literature | 137 | 393 |
| Philosophy | 121 | 169 |
| Linguistics studies | 166 | 479 |
| Total | 770 | 1742 |

**Figure 3.1 Number of 100 to 300 level students of the faculty of Art, UNIBEN.**

**(Source: Office of Director of Academic Planning, UNIBEN, 2025.)**

N= 770+1742

N= 2512

E= 0.05

$n= 2512/[1+2512(0.05^2)]$

= 2512/[1+2512(0.0025)]

=2512/[1+6.28]

=2512/[7.28]

n= 345.05

10% attrition rate = 35

345.05+35=380.25

**n=380 students**

### 3.5 Inclusion Criteria

This study focused on adolescent students in the age group of 16 to 19 years.

### 3.6 Instrument for Data Collection

Data will be collected using a structured questionnaire designed to evaluate the knowledge and perception of Diabetes mellitus within this specific age group. The instrument combines dictotomus, multiple choice, and likert scale questions to comprehensively assess both objective knowledge and subjective experiences of adolescent students regarding knowledge and perception of type 1 diabetes. It is designed to facilitate quantitative analysis and inform targeted interventions in nursing education and practice.

The questionnaire will be divided into

**Section A:** Demographic information comprising 5 questions relating to Age, Gender, Department, Level of Study and family history of diabetes mellitus.

**Section B:** Knowledge of Type 1 Diabetes Mellitus which include 5 questions to assess the level of understanding of type 1 diabetes mellitus

**Section C:** Perception of Type 1 Diabetes Mellitus which include 7 questions regarding perception of type 1 diabetes.

In this study the independent variable include; knowledge of type 1 diabetes, and demographic factors while dependent variable include perception of type 1 diabetes.

### 3.7 Sampling Technique

The sampling technique to be used will be Convenience sampling. It is a non-probability sampling technique where participants are selected for a study because they are readily available and easy to access for the researcher. This method prioritizes ease of access over selecting a representative sample from the entire population.

#### 3.7.1 Procedure for Data Collection

Eligible participants were identified and approached. The study was introduced to them, and those who expressed interest were briefed on the study's purpose, procedures, and ethical considerations. Written informed consent was obtained from participants before any data collection began. This ensured that participants understood their rights and the voluntary nature of their involvement. Participants were guided on how to fill out the questionnaire, and assistance was provided when necessary. Responses were collected and stored in a manner that ensured data integrity. Each questionnaire completion session was expected to last between 3 to 5 minutes.

### 3.8 Validity of Instrument

Validity is the extent to which a measurement tool measures what it is supposed to measure (Saldanha et al., 2021). Content validity will be established by mapping the items in the questionnaire against existing literature on knowledge and prevalence of Diabetes mellitus among adolescents. Content validity provides evidence about the degree to which elements of an assessment instrument are relevant to and representative of the targeted construct for a particular assessment purpose (Almanasreh et al., 2022). Face validity refers to the degree to which a layperson considers the content of a psychological test as relevant for an assumed assessment objective (Kemper, 2020). The face and content validity of the questionnaire were ensured by the supervisor.

### 3.9 Reliability of Instrument

According to Anjum et al. (2022), reliability is a key component of research quality, and it refers to stability and consistency of results across different conditions. A pilot test was conducted with a small sample (n=35) of adolescent students from a different tertiary institution who were not part of the main study. The results were compared using Cronbach's alpha to determine internal consistency, with a reliability coefficient of 0.7 or higher being considered acceptable.

### 3.10 Method of Data Analysis

Data were analyzed using both descriptive and inferential statistics. Each completed copy of the questionnaire was examined for consistency and completeness of variables. After the questionnaires were manually classified, the collected data were transferred into an Excel spreadsheet program. The Statistical Package for the Social Sciences (SPSS) software, version 25, was employed for data analysis. Descriptive statistics (such as frequencies, percentages, means, and standard deviations) were used to summarize the demographic characteristics. Inferential statistics, such as chi-square tests and logistic

regression analyses, were conducted to explore associations between demographic factors. Test results were considered significant at a p-value less than 0.05.

### 3.11 Ethical Consideration

Ethical considerations in research referred to the principles and guidelines that governed the conduct of research involving human subjects. These considerations ensured that the rights, dignity, and welfare of participants were protected throughout the research process. Key ethical principles included:

**Informed consent:** Participants provided written consent after being fully informed about the study's purpose, procedures, risks, and benefits.

**Privacy and confidentiality:** Participant information will be kept confidential and stored securely. Data will be anonymized by assigning codes instead of using personal identifiers.

**Compliance with regulation and guidelines:** Participant information was kept confidential and stored securely. Data were anonymized by assigning codes instead of using personal identifiers.

**Ethical use of data:** Ethical approval was sought from the College of Medicine Ethical Committee, University of Benin Ethics Review Board before data collection began.

**Non-maleficence:** Care was taken to avoid causing harm or discomfort to participants during data collection, and their well-being was prioritized at all times.

**Non-plagiarism:** Correct referencing and citation of different sources were ensured. Proper paraphrasing was also maintained.

# CHAPTER FOUR

# RESULTS

## 4.1 Introduction

This chapter presents the analysis and interpretation of data collected from the study on the knowledge and perception of Type 1 diabetes mellitus among adolescents in selected departments of the Faculty of Art, University of Benin. A total of 380 questionnaires were distributed, and the data was analyzed using descriptive and inferential statistics. The results are presented in accordance with the study objectives.

## 4.2 Demographic Characteristics of Respondents

The demographic characteristics of the respondents are presented in this section. The demographic variables considered include age, sex, department, and level of study

**Table 4.1: Demographic Characteristics of Respondents (n=380)**

| Variable | Category | Frequency (n) | Percentage (%) |
|---|---|---|---|
| **Age** | 16-17 years | 204 | 53.6 |
| | 18-19 years | 141 | 37.1 |
| | other | 35 | 9.3 |

| | | | |
|---|---|---|---|
| **Sex** | Male | 175 | 46.0 |
| | Female | 205 | 54.0 |
| **Department** | English and Literature | 135 | 35.4 |
| | Linguistics | 110 | 28.9 |
| | History and International Studies | 95 | 25.1 |
| | Others | 40 | 10.6 |
| **Level of Study** | 100 Level | 99 | 26.1 |
| | 200 Level | 128 | 33.7 |
| | 300 Level | 97 | 25.4 |
| | other Level | 56 | 14.8 |
| **Family History of Diabetes** | Yes | 72 | 19.2 |
| | No | 243 | 64.3 |
| | Not Sure | 65 | 16.5 |

Table 4.1 shows that the majority (53.6%) of the respondents were between 16-17 years, followed by those between 18-19 years (37.1%), and the least were between other years (9.3%). Regarding gender, there were more female respondents (54.0%) than male respondents (46.0%). The distribution across departments showed that English and Literature had the highest representation (35.4%), followed by Linguistics (28.9%), History and International Studies (25.1%), and Others (10.6%). Most respondents were in 200 Level (33.7%), followed by 100 Level (26.1%), 300 Level (25.4%), and other Level

(14.8%). Additionally, 19.2% of respondents reported having a family history of diabetes, 64.3% reported no family history, and 16.5% were not sure.

### 4.3 Knowledge of Type 1 Diabetes Mellitus

**Table 4.2: Respondents' Knowledge of Type 1 Diabetes Mellitus (n=380)**

| Knowledge Question | Correct Response | Frequency (n) | Percentage (%) |
|---|---|---|---|
| What is Type 1 Diabetes Mellitus? | A disease where the body doesn't produce insulin | 146 | 38.5 |
| Type 1 Diabetes Mellitus is caused by: | Autoimmune destruction of insulin-producing cells | 99 | 26.1 |
| How is Type 1 Diabetes Mellitus mainly managed? | Insulin injections or an insulin pump | 187 | 49.1 |
| Can Type 1 Diabetes Mellitus be prevented? | No | 127 | 33.3 |
| Is Type 1 Diabetes Mellitus different from Type 2 Diabetes Mellitus? | Yes | 226 | 59.5 |

Table 4.2 shows the respondents' knowledge regarding Type 1 diabetes mellitus. Only 38.5% correctly identified Type 1 diabetes as a disease where the body doesn't produce insulin. A smaller percentage (26.1%) correctly identified the cause as autoimmune destruction of insulin-producing cells. Regarding

management, 49.1% correctly identified insulin injections or insulin pump as the main management approach. Only 33.3% correctly identified that Type 1 diabetes cannot be prevented, while 59.5% correctly identified that Type 1 diabetes is different from Type 2 diabetes.

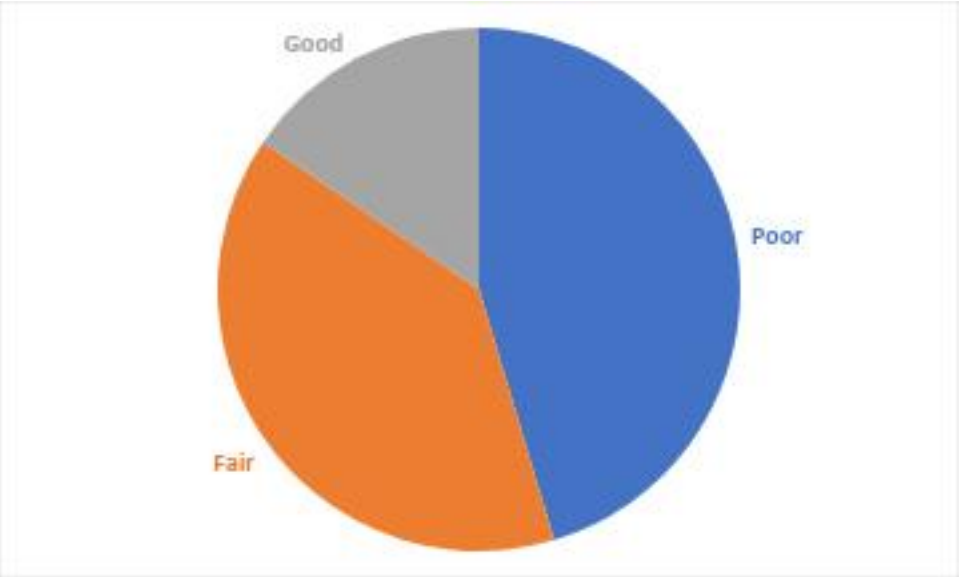


**Figure 4.1: Overall Level of Knowledge of Type 1 Diabetes Mellitus (n=380)**

Figure 4.1 presents the overall level of knowledge of Type 1 diabetes mellitus among the respondents. The majority (45.4%) had poor knowledge, followed by those with fair knowledge (39.2%), and the least had good knowledge (15.4%).

### 4.4 Perception of Type 1 Diabetes Mellitus

**Table 4.3: Respondents' Perception of Type 1 Diabetes Mellitus (N=380)**

| Statement | SA n(%) | A n(%) | N n(%) | D n(%) | SD n(%) |
|---|---|---|---|---|---|
| Type 1 diabetes is a serious medical condition | 146 (38.5) | 128 (33.7) | 71 (18.6) | 24 (6.2) | 11 (3.1) |
| Only adults can develop type 1 diabetes | 34 (8.9) | 56 (14.8) | 89 (23.4) | 127 (33.3) | 74 (19.6) |
| People with type 1 diabetes can live normal lives with proper care | 114 (29.9) | 158 (41.6) | 73 (19.2) | 25 (6.5) | 10 (2.7) |
| I feel confident I could help a friend manage their type 1 diabetes | 32 (11.0) | 58 (19.9) | 97 (33.3) | 71 (24.4) | 33 (11.3) |
| Type 1 diabetes can be prevented through diet and exercise alone | 54 (14.1) | 99 (26.1) | 114 (29.9) | 74 (19.6) | 39 (10.3) |
| I would be comfortable having a roommate with type 1 diabetes | 71 (18.6) | 146 (38.5) | 116 (30.6) | 35 (9.3) | 12 (3.1) |
| I believe awareness about type 1 diabetes should be promoted more | 187 (49.1) | 128 (33.7) | 43 (11.3) | 16 (4.1) | 6 (1.7) |

Table 4.3 shows the perception of respondents regarding Type 1 diabetes mellitus. The majority (72.2%) of the respondents agreed (SA + A) that Type 1 diabetes is a serious medical condition. A majority (52.9%) disagreed (D + SD) that only adults can develop Type 1 diabetes. Regarding living a normal life with proper care, 71.5% agreed (SA + A). Only 30.9% felt confident they could help a friend manage their Type 1 diabetes. A significant percentage (40.2%) believed that Type 1 diabetes can be prevented through diet and exercise alone, which indicates a misconception. Most respondents (57.1%) would be

comfortable having a roommate with Type 1 diabetes. An overwhelming majority (82.8%) agreed that awareness about Type 1 diabetes should be promoted more.

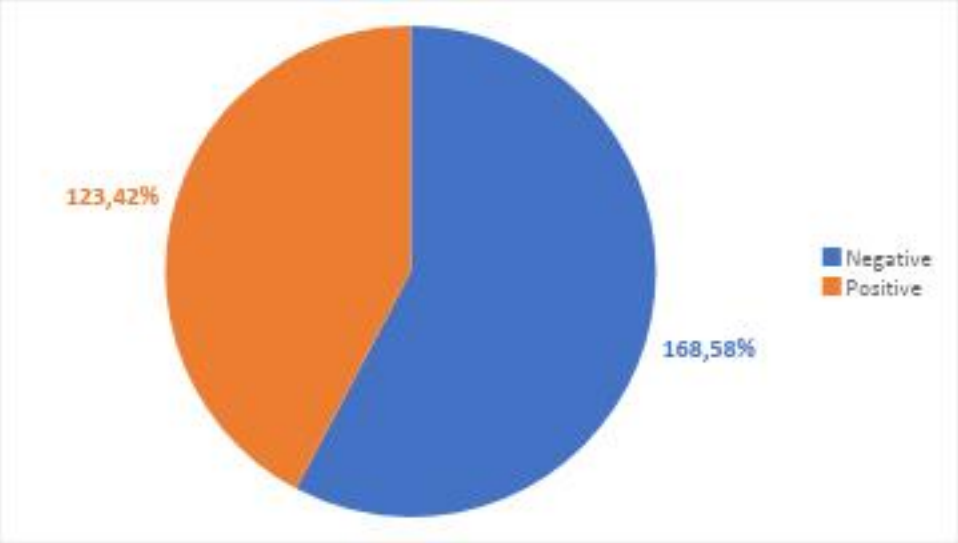


**Figure 4.2: Level of perception**

Figure 4.2 presents the overall level of perception of Type 1 diabetes mellitus among the respondents. The majority (57.7%) had negative perception, while 42.3% had positive perception.

### 4.5 Hypotheses Testing

#### 4.5.1 Relationship Between Knowledge and Perception

**Table 4.4: Relationship Between Knowledge Level and Perception of Type 1 Diabetes Mellitus (n=380)**

| Variables | Perception Level | | Chi-Square | P-value |
|---|---|---|---|---|
| | Negative n(%) | Positive n(%) | | |

| | | | | |
|---|---|---|---|---|
| **Knowledge Level** | | | 18.743 | <0.001* |
| Poor (n=172) | 121 (70.5) | 51 (29.5) | | |
| Fair (n=149) | 84 (56.1) | 65 (43.9) | | |
| Good (n=59) | 14 (24.4) | 45 (75.6) | | |
| **Sex** | | | 2.157 | 0.142 |
| Male (n=175) | 108 (61.9) | 67 (38.1) | | |
| Female (n=205) | 111 (54.1) | 94 (45.9) | | |

*Significant at $p < 0.05$

Table 4.4 shows the relationship between knowledge level, perception level, and sex. There was a statistically significant relationship between knowledge level and perception level ($p < 0.001$). Respondents with poor knowledge were more likely to have negative perception (70.5%) compared to those with fair knowledge (56.1%) and good knowledge (24.4%). Conversely, respondents with good knowledge were more likely to have positive perception (75.6%) compared to those with fair knowledge (43.9%) and poor knowledge (29.5%).

### 4.5.2: Relationship Between sex and Perception of Type 1 Diabetes Mellitus

**Table 4.5: Relationship Between sex and Perception of Type 1 Diabetes Mellitus (n=380)**

| **Variables** | **Perception Level** | | **Chi-Square** | **P-value** |
|---|---|---|---|---|
| | **Negative n(%)** | **Positive n(%)** | | |
| **Sex** | | | 2.157 | 0.142 |
| Male (n=134) | 108 (61.9) | 67 (38.1) | | |
| Female (n=157) | 111 (54.1) | 94 (45.9) | | |

*Significant at $p < 0.05$

Table 4.5 shows the relationship Between sex and Perception of Type 1 Diabetes Mellitus (N=291). It shows that although a higher percentage of males (61.9%) had negative perception compared to females (54.1%), this difference was not statistically significant ($p = 0.142$).

# CHAPTER FIVE

# SUMMARY, CONCLUSION AND RECOMMENDATIONS

## 5.1 Summary of Findings

This study aimed to evaluate the knowledge and perception of Type 1 diabetes mellitus among students in selected departments of the Faculty of Art, University of Benin. The findings revealed that:

1. The majority (45.4%) of the adolescents had poor knowledge of Type 1 diabetes mellitus, followed by those with fair knowledge (39.2%), and the least had good knowledge (15.4%).
2. Only 26.1% of the adolescents correctly identified the cause of Type 1 diabetes as autoimmune destruction of insulin-producing cells, indicating a significant knowledge gap.
3. Only 33.3% of the adolescents correctly identified that Type 1 diabetes cannot be prevented, suggesting a misunderstanding of the preventive measures for Type 1 diabetes.
4. There was a significant relationship between knowledge level and perception of Type 1 diabetes, with those having good knowledge more likely to have accurate perceptions.
5. There were no significant gender differences in knowledge and perception of Type 1 diabetes among the adolescents.

## 5.2 Discussion of Findings

The findings of this study revealed that the majority of adolescents in the Faculty of Art, University of Benin have poor knowledge of Type 1 diabetes mellitus, with only 15.4% demonstrating good knowledge. This aligns with findings from several studies in the literature on adolescents' knowledge of diabetes.

### 5.2.1 Knowledge of Type 1 Diabetes Among Adolescents

The poor knowledge level observed in this study (45.4%) is consistent with findings from Agofure and Oghenerume (2022), who found that while 88% of secondary school students in Nigeria were aware of diabetes, only 3.4% had a thorough understanding of its origins, symptoms, risk factors, and consequences. Similarly, Orok et al. (2024) reported that only 25.2% of university undergraduates in southern Nigeria had good knowledge of diabetes mellitus, despite 92.3% being aware of the condition.

Our finding that only 26.1% of respondents correctly identified the cause of Type 1 diabetes as autoimmune destruction of insulin-producing cells reflects the significant knowledge gaps identified by Mishriky et al. (2022), who found that less than 40% of teenagers with T1D comprehended the long-term consequences of poorly controlled diabetes. This limited understanding could be attributed to insufficient educational delivery, as suggested by Naef et al. (2024), who found that many adolescents had basic knowledge of T1D but significant gaps in understanding advanced management strategies.

The study's finding that only 33.3% of respondents correctly identified that Type 1 diabetes cannot be prevented echoes Mohammad et al.'s (2020) research, which found that only 38.7% of children with type 1 diabetes had sufficient general knowledge of the condition. This widespread misconception about prevention could lead to inappropriate blame or stigma directed at individuals with Type 1 diabetes, suggesting they could have prevented their condition through lifestyle modifications.

Our results also reflect the findings of Zemba et al. (2023) in Burkina Faso, where adolescents and young adults demonstrated moderate knowledge scores with strengths in general diabetes awareness but weaknesses in specific aspects of diabetes management. This pattern is similar to our finding that while 59.5% of respondents correctly identified that Type 1 diabetes is different from Type 2 diabetes, fewer could correctly identify the cause (26.1%) or prevention possibilities (33.3%).

The knowledge disparities observed in our study may be related to socioeconomic factors as highlighted by Cveticanin and Arsenovic (2025), who found that low-SES settings have significant knowledge

deficits due to limited access to healthcare resources and education. This suggests a need for targeted educational interventions that take into account the socioeconomic context of the students.

### 5.2.2 Perception of Type 1 Diabetes Among Adolescents

Regarding perception, our finding that 72.2% of respondents recognized Type 1 diabetes as a serious medical condition aligns with the findings of Jonker et al. (2020), who identified that adolescents with well-controlled diabetes perceived the condition as serious due to awareness of potential complications. Similarly, Ostrominski et al. (2025) found that teenagers who perceived T1D as a serious but controllable disease were more likely to adhere to therapy.

The positive perception that people with Type 1 diabetes can live normal lives with proper care (71.5% agreement) echoes the findings of Williams et al. (2023), who found that technologies like continuous glucose monitoring helped adolescents feel empowered and gain control over their condition, leading to more positive perceptions. This also aligns with Deacon's (2023) "smile with diabetes" attitude observed among South African teenagers with access to better resources.

However, the misconception among 40.2% of our respondents that Type 1 diabetes can be prevented through diet and exercise alone reflects the knowledge gaps identified by Cveticanin and Arsenovic (2024), who found that there is often a gap between clinical knowledge and personal perception, with adolescents sometimes underestimating long-term risks or misunderstanding fundamental aspects of the condition.

Our finding that a majority (57.1%) would be comfortable having a roommate with Type 1 diabetes suggests a relatively positive social perception, contrasting with some findings from Taraban et al. (2022) where adolescents with T1D reported feeling ostracized and experiencing social isolation due to lack of understanding from peers. This suggests potential for creating supportive environments for individuals with Type 1 diabetes in university settings.

The overwhelming agreement (82.8%) that awareness about Type 1 diabetes should be promoted more aligns with Olinder et al. (2022) ISPAD Clinical Practice Consensus Guidelines, which emphasized the need for diabetes education for adolescents. This strong desire for more awareness indicates recognition of the current knowledge gap and willingness to learn more about the condition.

### 5.2.3 Relationship Between Knowledge and Perception

The significant relationship between knowledge level and perception found in our study supports Allen et al.'s (2024) findings that considering T1D as manageable and intelligible led to improved outcomes. Respondents with good knowledge in our study were more likely to have accurate perceptions about Type 1 diabetes, which could lead to better support and attitudes toward individuals with the condition.

This relationship is also consistent with Naef et al.'s (2023) observation that improved knowledge through digital interventions enhanced adolescents' perceptions of T1D. Our findings reinforce the importance of knowledge as a foundation for positive perceptions and attitudes toward Type 1 diabetes.

### 5.2.4 Gender Differences in Knowledge and Perception

The absence of significant gender differences in knowledge and perception in our study suggests that both male and female adolescents in the Faculty of Art, University of Benin have similar exposure to information about Type 1 diabetes. This finding differs from some studies that have found gender differences in health literacy and knowledge among adolescents. The lack of gender difference suggests that educational interventions should target both genders equally.

The findings from this study point to the need for comprehensive diabetes education that addresses specific misconceptions and knowledge gaps. As suggested by Olinder et al. (2022), education tailored to developmental phases leads to better information retention and favorable attitudes towards diabetes.

Interactive, peer-supported learning approaches may be more effective than traditional didactic techniques in promoting accurate perceptions.

The study by Naef et al. (2024) on digital health interventions provides a promising avenue for increasing T1D awareness among university students. Mobile apps and online platforms could be integrated into university health programs to improve knowledge of diabetes management practices among adolescents.

The findings of Owusu et al. (2023) on the influence of family support and Zhang et al.'s (2025) observation on the role of technology in shaping perceptions of T1D suggest that comprehensive approaches involving both social support systems and technological tools could be effective in improving knowledge and perceptions among adolescents.

### 5.3 Conclusion

Based on the findings, it can be concluded that the knowledge of Type 1 diabetes mellitus among adolescents in the Faculty of Art, University of Benin is predominantly poor, with a limited understanding of its cause and preventive measures. However, there is a negative perception regarding the seriousness of the condition and the possibility of living a normal life with proper care. The relationship between knowledge and perception underscores the importance of improving knowledge to foster more accurate perceptions. The absence of gender differences in knowledge and perception suggests that both male and female adolescents have similar exposure to information about Type 1 diabetes.

### 5.4 Recommendations

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

1. **Inclusion of Diabetes Education in Curriculum**: The University of Benin should consider incorporating diabetes education into the general studies curriculum to improve knowledge among all students, regardless of their field of study.
2. **Health Education Campaigns**: The university health services, in collaboration with the Faculty of Art, should organize regular health education campaigns focusing on Type 1 diabetes and other non-communicable diseases to raise awareness among adolescents.
3. **Collaboration with Diabetes Organizations**: The university should collaborate with diabetes organizations to provide resources and support for diabetes education and awareness programs.
4. **Integration of Diabetes Education in Orientation Programs**: Diabetes education should be integrated into the orientation programs for new students to ensure early exposure to accurate information about Type 1 diabetes.
5. **Regular Screening Programs**: Regular screening programs for Type 1 diabetes should be organized for adolescents to facilitate early detection and management.

### 5.5 Implications for Nursing Practice

The findings of this study have several implications for nursing practice:

1. **Role in Health Education**: Nurses have a crucial role in health education and should be at the forefront of educating adolescents about Type 1 diabetes.
2. **Targeting Misconceptions**: Nursing interventions should specifically target the identified misconceptions about Type 1 diabetes, such as the belief that it can be prevented through diet and exercise alone.
3. **Integration of Diabetes Education in School Health Programs**: Nurses should advocate for the integration of diabetes education in school health programs to improve knowledge among adolescents.

4. **Support for Adolescents with Type 1 Diabetes**: Nurses should provide support for adolescents with Type 1 diabetes to help them manage their condition effectively and live normal lives.

### 5.6 Limitations of the Study

The study had several limitations that should be considered when interpreting the findings:

1. **Cross-sectional Design**: The cross-sectional design of the study only provided a snapshot of the knowledge and perception at a specific point in time and did not allow for the examination of changes over time.
2. **Self-reported Data**: The use of self-reported data may have introduced bias, as respondents might have given socially desirable responses instead of their true knowledge and perception.
3. **Limited Scope**: The study was limited to adolescents in selected departments of the Faculty of Art, University of Benin, which limits the generalizability of the findings to other faculties or universities.

### 5.7 Suggestions for Further Studies

Based on the limitations of this study, the following suggestions are proposed for further studies:

1. **Longitudinal Studies**: Longitudinal studies should be conducted to examine changes in knowledge and perception of Type 1 diabetes over time.
2. **Expanded Scope**: Future studies should include adolescents from other faculties and universities to provide a more comprehensive understanding of knowledge and perception of Type 1 diabetes among adolescents.
3. **Qualitative Studies**: Qualitative studies should be conducted to explore in-depth the factors influencing knowledge and perception of Type 1 diabetes among adolescents.

4. **Intervention Studies**: Intervention studies should be conducted to evaluate the effectiveness of different interventions for improving knowledge and perception of Type 1 diabetes among adolescents.

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**APPENDIX 1**
**DEPARTMENT OF NURSING SCIENCE**

**SCHOOL OF BASIC MEDICAL SCIENCES**

**UNIVERSITY OF BENIN, BENIN CITY, EDO STATE**

Dear respondent,

**QUESTIONNAIRE**

I am Enerenhangbe Okhah Hilary; a 500L student in the above named institution and I invite you to take part in this research study, which aims to explore, "**The knowledge and perception of type 1 diabetes mellitus among adolescents in selected departments of faculty of arts in a tertiary institution"**. This study will help us better understand how adolescents manage and cope with type 2 diabetes mellitus related to their diagnosis and treatment. Your insights are valuable in improving future care for young diabetes patients..

Your participation in this study is completely voluntary. You are free to withdraw at any point during the questionnaire without any consequences or impact on your current or future medical care. All information you provide will remain confidential and anonymous. This will take approximately 3-5 minutes of your time

**Section A: Demographic Information**

- Age on your last birthday: 16-17 □ 18-19 □ others □

- Sex: Male □ Female □
- Department: English and Literature □ Linguistics □ History and International Studies □ Others □
- Current Level of Study: 100 □ 200 □ 300 □ others □
- Do you have a family history of diabetes mellitus? Yes □ No □ Not sure □

**Section B: Knowledge of Type 1 Diabetes Mellitus**

Choose the most appropriate answer.

- What is Type 1 Diabetes Mellitus?

  □ A disease where the body doesn't produce insulin

  □ A disease caused by eating too much sugar

  □ A condition where the body produces too much insulin

  □ I don't know

- Type 1 Diabetes Mellitus is caused by:

  □ Lack of exercise

□ Poor diet

□ Autoimmune destruction of insulin-producing cells

□ Excess sugar intake

- How is Type 1 Diabetes Mellitus mainly managed?

□ Healthy diet only

□ Insulin injections or an insulin pump

□ Tablets or pills

□ I don't know

- Can Type 1 Diabetes Mellitus be prevented?

□ Yes

□ No

- Is Type 1 Diabetes Mellitus different from Type 2 Diabetes Mellitus?

□ Yes

□ No

## Section C: Perception of Type 1 Diabetes Mellitus

Please indicate how much you agree with the following statements using the scale below: **Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), Strongly Disagree (SD)**

| Statement | SA | A | N | D | SD |
|---|---|---|---|---|---|
| 11. Type 1 diabetes is a serious medical condition. | □ | □ | □ | □ | □ |
| 12. Only adults can develop type 1 diabetes. | □ | □ | □ | □ | □ |
| 13. People with type 1 diabetes can live normal lives with proper care. | □ | □ | □ | □ | □ |
| 14. I feel confident I could help a friend manage their type 1 diabetes. | □ | □ | □ | □ | □ |
| 15. Type 1 diabetes can be prevented through diet and exercise alone. | □ | □ | □ | □ | □ |
| 16. I would be comfortable having a roommate with type 1 diabetes. | □ | □ | □ | □ | □ |
| 17. I believe awareness about type 1 diabetes should be promoted more. | □ | □ | □ | □ | □ |