KNOWLEDGE AND SELF CARE PRACTICES AMONG TYPE 2 DIABETES PATIENTS IN A TERTIARY HOSPITAL, BENIN CITY, EDO STATE

BY

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SCHOOL OF BASIC MEDICAL SCIENCES
UNIVERSITY OF BENIN
UGBOWO, BENIN CITY

FEBRUARY, 2025

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IN PARTIAL FULFILLMENT OF THE REQUIREMENTS OF THE AWARD OF BACHELOR OF NURSING SCIENCE

FEBRUARY, 2025

DECLARATION

This is to declare that this research project titled "**KNOWLEDGE AND SELF CARE PRACTICES AMONG TYPE 2 DIABETES PATIENTS IN A TERTIARY HOSPITAL, BENIN CITY, EDO STATE**." will be carried out by ILEGBINIJIE OSARO CHARITY is solely the result of my work except were acknowledged as being derived from other person(s) or sources.

MATRICULATION NUMBER: BMS2009060

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

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CERTIFICATION/APPROVAL

This is to certify that this research project by **ILEGBINIJIE OSARO CHARITY** with Matriculation number **BMS2009060** has been examined and approved for the award of "Bachelor of Nursing Science".

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ABSTRACT

This study examined the knowledge, self-care practices, and glycemic control among diabetic patients in a tertiary institution in Benin City. Using semi-structured questionnaires, data was gathered from 230 respondents. Findings revealed that the majority (81.7%) of the respondents had type 2 diabetes, with 73% living with diabetes for 0-5 years. Knowledge of diabetes varied, with 53% exhibiting fair knowledge and only 18.3% demonstrating good knowledge levels. Self-care practices were generally poor, with only 16.5% adhering to a healthy meal plan and regular physical activity. Factors such as family and environmental support significantly impacted self-care. Furthermore, 87% of participants exhibited poor glycemic control, with significant associations found between self-care practices and glycemic control ($p<0.05$). Logistic regression analysis indicated that married individuals and those aged 41-50 had higher odds of good knowledge and glycemic control. In conclusion, this study highlights the critical need for improved diabetes education and support structures within the population, as inadequate knowledge and self-care practices were prevalent among respondents. Interventions targeting family and community support, along with increased accessibility to healthcare resources, are essential to enhance self-care practices and glycemic outcomes in diabetes management..

Key words: Self-Care Practices, Glycemic Control, Tertiary Institution, Family and Environmental Support and Diabetes Education

DEDICATION

This work is dedicated to God Almighty, who is the foundation of my faith and the source of my strength. He is my sufficiency and my ever-present help, guiding me through every step of this journey.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Diabetes is a chronic progressive endocrinological disorder of carbohydrate, protein and lipid metabolism, characterized by elevated levels of glucose in the blood (hyperglycaemia) due mainly to absolute insulin deficiency (in type 1) or relative deficiency and insulin resistance (in type 2) (World Health Organisation (WHO), 2021). Globally, the number of people with type 2 diabetes is rising rapidly. This rise is associated with population growth, economic development, ageing populations, increasing urbanisation, dietary changes, obesity, reduced physical activity and changes in other lifestyle patterns (WHO, 2021). The International Diabetes Federation indicated a global estimate of more than 371 million people living with diabetes in 2019, with a prevalence of 8.3% (International Diabetes Federation (IDF), 2021). Half of these people are not even aware that they have it. In Africa, with diabetes census of 15 million, cases are expected to almost double over the next 20 years. Sadly, about 81.2% of people in this region do not even know they are living with the disease (IDF, 2021). In Nigeria with a national prevalence of 4.83%, over 3 million people are currently living with diabetes (IDF, 2021).

Diabetes is one of the major causes of morbidity and mortality; it has a significant impact on the patients' quality of life, productivity and involves enormous health costs for virtually every society (Roglic et al., 2021). One in twenty adult deaths in developing countries is diabetes-related (Roglic et al., 2021), with Africa having the highest mortality rate due to diabetes (IDF, 2022). Complications due to diabetes are implicated in disability, increased cost of care, reduced quality of life and death (IDF, 2021). Most of these medical problems

can however, be prevented with proper self-care, as emphasised in the standard treatment guidelines of Nigeria (Federal Ministry of Health (FMoH), 2021).

For effective management of diabetes, patients must be actively involved in their care: this requires performance of many complex self-care behaviours including lifestyle modifications (such as dietary control, regular exercise and psychosocial coping skills) and medical self-care (medication use and self-monitoring of blood glucose (SMBG)). Importantly, adequate self-care needs to persist over time if it is going to lessen complications and prolong life (Kaufman, 2022). The increase in severity of diabetes every year has been linked to patient's lack of knowledge and practice of proper self-care (Ruchirawanitchathep, 2021). According to Inzucchi, 2021 a well-informed patient will have the best advantage to attain and maintain glycaemic and cardiovascular risk factor control. Consequently, poor knowledge of self-care can cause poor long-term metabolic control which may lead to the development of diabetic complications such as retinopathy, nephropathy, neuropathy, and atherosclerotic changes. Thus, patients require education about the various aspects of self-care, ranging from general lifestyle advice to knowledge about the medicine they are prescribed (cardiovascular risk factors like smoking, obesity; regular medical and ophthalmological examinations, foot care, diet, etc) (Department of Health, 2022). Due to its extreme importance, an annual assessment of patients' skills and knowledge has been recommended by The American Diabetes Association, 2020. Therefore, this study therefore aims to assess the knowledge and self-care practices among type-2 diabetes mellitus patients in selected hospitals, Benin City, Edo state.

1.2 Statement of the Problem

Diabetes mellitus is a chronic noncommunicable metabolic disorder that is of great concern to world health leaders due to its fast-growing prevalence worldwide. Globally an estimated 425 million adults between 20 and 79 years of age were living with diabetes in 2017, and by

2045, this may increase to 629 million (Forouhi, 2021). In 2021, Nigeria has a diabetes prevalence of 3.6% among adults aged 20–79 years (World Data Atlas, 2022). The increasing morbidity and mortality associated with diabetes lead to physical disabilities and social and economic losses with adverse consequences on the individual, family, and society. Minimizing these consequences largely depends on adequate management of type 2 diabetes mellitus (T2DM) to achieve glycemic control.

The management of T2DM requires lifestyle modification through self-care practices. Similarly, adherence to self-care practices depends on the patients' knowledge and understanding of T2DM and its diabetes management (Kassahun et al., 2021). Patients' inadequate knowledge about T2DM control targets and self-care practices had been documented to be associated with poor glycemic control (Kassahun et al., 2021). Furthermore, good knowledge of T2DM is known to be associated with better management outcomes in terms of decreases in glycated hemoglobin values and adherence to T2DM self-care behaviors (Nazir et al., 2021).

However, poor glycemic control among people living with T2DM remains a challenge (Iwuala et al., 2021). The American Diabetes Association in 2020, reported that an estimated 30%–49% of diabetic patients do not have adequate control of blood sugar, blood pressure, or blood cholesterol and that only 14% have adequate control of these three factors (American

Diabetes Association, 2020). In Nigeria, scholars had also documented poor glycemic control among people living with T2DM (Iwuala et al., 2021).

Poor T2DM-related knowledge had been documented among people living with T2DM in India, (Eunyoung & Yuh, 2021) Ethiopia (Kassahun et al., 2021) and Nigeria (Sabo et al., 2021). Furthermore, Bayem et al., (2021) documented that the majority of people living with T2DM in Nigeria had issues with diabetes self-care practices. Opara et al., (2020) further

found out in a study among people living with T2DM in Enugu and Nigeria that adherence to diabetes self-care practices was very poor. It had also been documented in some settings that the state of glycemic control can be improved if patients' knowledge of diabetes and self-care behaviors improved (Dedefo et al., 2021).

A significant relationship had been found to exist between T2DM knowledge and self-care practice among people living with T2DM in Malta, (Formosa & Muscat, 2021) India, (Mehta et al., 2021), Malaysia, (Abbasi et al., 2019) and Ethiopia (Dedefo at al., 2021). However, little is known about the relationship between T2DM-related knowledge and self-care among people living with T2DM in South southern Nigeria. Therefore, this study aims to assess the knowledge and self-care practices among type-2 diabetes mellitus patients in selected hospitals, Benin City, Edo state.

1.3 Objectives of the Study

The main objective of the study is to assess the knowledge and self-care practices among type-2 diabetes mellitus patients in selected hospitals, Benin City, Edo state.

The specific objectives of the study are to:

1. ascertain the level of knowledge of diabetes mellitus among type-2 diabetes mellitus patients in selected hospitals, Benin City, Edo State.
2. assess the level of self-care practices of type-2 diabetes mellitus patients in selected hospitals, Benin City, Edo State.
3. identify factors influencing the self-care practices of type-2 diabetes mellitus patients in selected hospitals, Benin City, Edo State.
4. assess the glycemic control of type-2 diabetes mellitus patients in selected hospitals, Benin City, Edo State.

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 diabetes mellitus among type-2 diabetes mellitus patients in selected hospitals, Benin City, Edo State?
2. What is the level of self-care practices of type-2 diabetes mellitus patients in selected hospitals, Benin City, Edo State?
3. What are the factors influencing the self-care practices of type-2 diabetes mellitus patients in selected hospitals, Benin City, Edo State?
4. What is the glycemic control of type-2 diabetes mellitus patients in selected hospitals, Benin City, Edo State?

1.5 Hypothesis

There is no significant difference between the knowledge and self-care practices of type-2 diabetes mellitus patients in selected hospitals, Benin City, Edo State.

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 assesses their level of knowledge and their self-care

practices, 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 will be focused on the knowledge and self-care practices among type-2 diabetes mellitus patients in selected hospitals, Benin City, Edo State. The study will equally be delimited to type-2 diabetes mellitus patients that attend Consultant out patients department . It is equally delimited to the objectives that will guide the study.

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.

Self-care practice: These are ways by which individuals look after their own health using the knowledge and information available to them.

CHAPTER TWO

LITERATURE REVIEW

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

2.1 Concept of Diabetes Mellitus

Diabetes mellitus (DM) is a chronic metabolic disorder characterized by persistent hyperglycemia. It may be due to impaired insulin secretion, resistance to peripheral actions of insulin, or both. According to the International Diabetes Federation (IDF), approximately 415 million adults between the ages of 20 to 79 years had diabetes mellitus in 2015 (Zheng et al., 2021). DM is proving to be a global public health burden as this number is expected to rise to another 200 million by 2040 (Zheng et al., 2021). Chronic hyperglycemia in synergy with the other metabolic aberrations in patients with diabetes mellitus can cause damage to various organ systems, leading to the development of disabling and life-threatening health complications, most prominent of which are microvascular (retinopathy, nephropathy, and neuropathy) and macrovascular complications leading to a 2-fold to 4-fold increased risk of cardiovascular diseases. In this review, we provide an overview of the pathogenesis, diagnosis, clinical presentation, and principles of management of diabetes.

Etiology

DM is broadly classified into three types by etiology and clinical presentation, type 1 diabetes, type 2 diabetes, and gestational diabetes (GDM). Some other less common types of diabetes include monogenic diabetes and secondary diabetes (Malek et al., 2021).

Type 1 Diabetes Mellitus (T1DM)

Type 1 diabetes mellitus (T1DM) accounts for 5% to 10% of DM and is characterized by autoimmune destruction of insulin-producing beta cells in the islets of the pancreas. As a result, there is an absolute deficiency of insulin. A combination of genetic susceptivity and environmental factors such as viral infection, toxins, or some dietary factors have been implicated as triggers for autoimmunity. T1DM is most commonly seen in children and adolescents though it can develop at any age.

Type 2 Diabetes Mellitus

Type 2 diabetes mellitus (T2DM) accounts for around 90% of all cases of diabetes. In T2DM, the response to insulin is diminished, and this is defined as insulin resistance. During this state, insulin is ineffective and is initially countered by an increase in insulin production to maintain glucose homeostasis, but over time, insulin production decreases, resulting in T2DM. T2DM is most commonly seen in persons older than 45 years. Still, it is increasingly seen in children, adolescents, and younger adults due to rising levels of obesity, physical inactivity, and energy-dense diets.

Gestational Diabetes Mellitus

Hyperglycaemia, which is first detected during pregnancy, is classified as gestational diabetes mellitus (GDM), also known as hyperglycemia in pregnancy. Although it can occur anytime during pregnancy, GDM generally affects pregnant women during the second and third trimesters. According to the American Diabetes Association (ADA), GDM complicates 7% of all pregnancies. Women with GDM and their offspring have an increased risk of developing type 2 diabetes mellitus in the future.

GDM can be complicated by hypertension, preeclampsia, and hydramnios and may also lead to increased operative interventions. The fetus can have increased weight and size (macrosomia) or congenital anomalies. Even after birth, such infants may have respiratory distress syndrome and subsequent childhood and adolescent obesity. Older age, obesity, excessive gestational weight gain, history of congenital anomalies in previous children, or stillbirth, or a family history of diabetes are risk factors for GDM.

Monogenic Diabetes

A single genetic mutation in an autosomal dominant gene causes this type of diabetes. Examples of monogenic diabetes include conditions like neonatal diabetes mellitus and maturity-onset diabetes of the young (MODY). Around 1 to 5% of all diabetes cases are due to monogenic diabetes. MODY is a familial disorder and usually presents under the age of 25 years.

Secondary Diabetes

Secondary diabetes is caused due to the complication of other diseases affecting the pancreas (for example, pancreatitis), hormone disturbances (for example, Cushing disease), or drugs (for example, corticosteroids).

Epidemiology

Diabetes is a worldwide epidemic. With changing lifestyles and increasing obesity, the prevalence of DM has increased worldwide. The global prevalence of DM was 425 million in 2017. According to the International Diabetes Federation (IDF), in 2015, about 10% of the American population had diabetes. Of these, 7 million were undiagnosed. With an increase in age, the prevalence of DM also increases. About 25% of the population above 65 years of age has diabetes (Carrillo-Larco et al., 2021).

Pathophysiology

In T1DM, there is cellular-mediated, autoimmune destruction of pancreatic beta cells. T1DM has a strong genetic predisposition. The major histocompatibility complex (MHC), also known as human leukocyte antigens (HLA), is reported to account for approximately 40 to 50% of the familial aggregation of T1DM. The significant determinants are polymorphisms of class II *HLA* genes encoding DQ and DR4-DQ8, with DR3-DQ2, found in 90% of T1DM patients.

Another form of T1DM is latent autoimmune diabetes of adults (LADA). It occurs in adulthood, often with a slower course of onset.

The rate of destruction is generally rapid in children and faster in adults. Autoantibodies against islet cells, insulin, glutamic acid decarboxylase-65 (GAD-65), and zinc transporter 8

(Zn T8) may be detected in the serum of such patients. These antibodies wane over time and do not have sufficient diagnostic accuracy to be used routinely for diagnosis, especially after the first year. With the progressive destruction of beta cells, there is little or no secretion of insulin. These patients are generally not obese. They are more prone to develop other autoimmune disorders such as Addison disease, Graves disease, Hashimoto thyroiditis, and celiac disease. A subset of T1DM not associated with insulin autoimmunity and not associated with the above HLA is termed idiopathic T1DM. It is more common in African and Asians and presents with episodic diabetic ketoacidosis (DKA).

T2DM is an insulin-resistance condition with associated beta-cell dysfunction. Initially, there is a compensatory increase in insulin secretion, which maintains glucose levels in the normal range. As the disease progresses, beta cells change, and insulin secretion is unable to maintain glucose homeostasis, producing hyperglycemia. Most of the patients with T2DM

are obese or have a higher body fat percentage, distributed predominantly in the abdominal region. This adipose tissue itself promotes insulin resistance through various inflammatory mechanisms, including increased FFA release and adipokine dysregulation. Lack of physical activity, prior GDM in those with hypertension or dyslipidemia also increases the risk of developing T2DM. Evolving data suggest a role for adipokine dysregulation, inflammation, abnormal incretin biology with decreased incretins such as glucagon-like peptide-1 (GLP-I) or incretin resistance, hyperglucagonemia, increased renal glucose reabsorption, and abnormalities in gut microbiota.

History and Physical

Patients with diabetes mellitus most commonly present with increased thirst, increased urination, lack of energy and fatigue, bacterial and fungal infections, and delayed wound healing. Some patients can also complain of numbness or tingling in their hands or feet or with blurred vision.

These patients can have modest hyperglycemia, which can proceed to severe hyperglycemia or ketoacidosis due to infection or stress. T1DM patients can often present with ketoacidosis (DKA) coma as the first manifestation in about 30% of patients.

The height, weight, and body mass index (BMI) of patients with diabetes mellitus should be recorded. Retinopathy needs to be excluded in such patients by an ophthalmologist. All pulses should be palpated to examine for peripheral arterial disease. Neuropathy should be ruled out by physical examination and history

Evaluation

Screening

Persons older than 40 years of age should be screened annually. More frequent screening is recommended for individuals with additional risk factors for diabetes (Hussain & Chowdhury, 2019).

- Certain races/ethnicities (Native American, African American, Hispanics, or Asian American, Pacific Islander),
- Overweight or obese persons with a BMI greater than or equal to 25 kg/m2 or 23 kg/m2 in Asian Americans,
- First-degree relative with diabetes mellitus
- History of cardiovascular disease or hypertension
- Low HDL-cholesterol or hypertriglyceridemia,
- Women with polycystic ovarian syndrome
- Physical inactivity
- Conditions associated with insulin resistance, for example, Acanthosis nigricans.

Women diagnosed with gestational diabetes mellitus (GDM) should have lifelong testing at least every three years. For all other patients, testing should begin at age 45 years, and if results are normal, patients should be tested at a minimum of every 3-years.

The same tests are used to both screen for and diagnose diabetes. These tests also detect individuals with prediabetes.

Diagnosis

Diabetes can be diagnosed either by the hemoglobin A1C criteria or plasma glucose concentration (fasting or 2-hour plasma glucose).

Fasting Plasma Glucose (FPG)

A blood sample is taken after an 8 hour overnight fast. As per ADA, fasting plasma glucose (FPG) level of more than 126 mg/dL (7.0 mm/L) is consistent with the diagnosis.

Two-Hour Oral Glucose Tolerance Test (OGTT)

In this test, the plasma glucose level is measured before and 2 hours after the ingestion of 75 gm of glucose. DM is diagnosed if the plasma glucose (PG) level in the 2-hour sample is more than 200 mg/dL (11.1 mmol/L). It is also a standard test but is inconvenient and more costly than FPG and has major variability issues. Patients need to consume a diet with at least 150 g per day of carbohydrates for 3 to 5 days and not take any medications that can impact glucose tolerance, such as steroids and thiazide diuretics (Martinez et al., 2021)

Glycated Hemoglobin (Hb) A1C

This test gives an average of blood glucose over the last 2 to 3 months. Patients with a Hb A1C greater than 6.5% (48 mmol/mol) are diagnosed as having DM. Hb A1C is a convenient, rapid, standardized test and shows less variation due to pre-analytical variables. It is not much affected by acute illness or stress.

Hb A1C is costly and has many issues, as discussed below, including lower sensitivity. Hb A1C should be measured using the National Glycohemoglobin Standardization Program (NGSP) certified method standardized to Diabetes Control and Complications Trial (DCCT) assay. It is affected by numerous conditions such as sickle cell disease, pregnancy,

hemodialysis, blood loss or transfusion, or erythropoietin therapy. It has not been well validated in non-white populations.

Anemia due to deficiency of iron or vitamin B12 leads to spurious elevation of Hb A1C, limiting its use in countries with a high prevalence of anemia. Also, in children and the elderly, the relation between Hb A1C and FPG is suboptimal.

For all of the above tests, if the person is asymptomatic, testing should be repeated later to make a diagnosis of diabetes mellitus.

In patients with classic symptoms of hyperglycemia (increased thirst, increased hunger, increased urination), random plasma glucose more than 200 mg/dL is also sufficient to diagnose DM.

FPG, 2-hour PG during 75-g GTT, and Hb A1C are equally appropriate for the diagnosis of DM. There is no concordance between the results of these tests (Kempegwoda et al., 2021)

Diagnosis of Gestational Diabetes Mellitus

Pregnant women not previously known to have diabetes should be tested for GDM at 24 to 28 weeks of gestation. ADA and American College of Obstetrics and Gynecology (ACOG) recommend using either a 1-step or 2-step approach for diagnosing GDM.

One-Step Strategy

75 gm OGTT is performed after an overnight fast. Blood samples are collected at fasting for 1 hour and 2 hours. GDM is diagnosed if fasting glucose meet or exceed 92 mg/dl (5.1 mmol/l), 1-hour serum glucose of 180 mg/dl (10.0 mmol/l) or 2-hour serum glucose of 153 mg/dl (8.5 mmol/l).

Two-Step Strategy

- Step one: Perform a 50-gram glucose challenge test irrespective of the last meal. If PG at 1-hour after the load is greater than or equal to 140mg/dl (7.8 mmol/l), proceed to step 2.

- Step 2: 100 g glucose OGTT is performed after overnight fasting. Cut off values are fasting PG 95 or 105 mg/dl (5.5/5.8 mmol/l), 1-hour PG of 180 or 190 mg/dl (10.0/10.6 mmol/l), 2-hour PG of 155 or 165 mg/dl (8.6/9.2 mmol/l) or 3-hour PG of 140 or 145 mg/dl (7.8/8.0 mmol/l). GDM is diagnosed if two or more PG levels equal to or exceed these cutoffs.

Treatment / Management

For both T1DM and T2DM, the cornerstone of therapy is diet and exercise (Lai et al., 2019).

A diet low in saturated fat, refined carbohydrates, high fructose corn syrup, and high in fiber and monounsaturated fats needs to be encouraged. Aerobic exercise for a duration of 90 to 150 minutes per week is also beneficial. The major target in T2DM patients, who are obese, is weight loss (Eckstein et al., 2021)

If adequate glycemia cannot be achieved, metformin is the first-line therapy. Following metformin, many other therapies such as oral sulfonylureas, dipeptidyl peptidase-4 (DPP-4) inhibitors. Glucagon-like peptide-1 (GLP-I) receptor agonists, Sodium-glucose co-transporter-2 (SGLT2) inhibitors, pioglitazone, especially if the patient has fatty liver disease, alpha-glucosidase inhibitors, and insulin, are available. Recent studies have shown that the SGLT2 inhibitor, empagliflozin (EMPA), and the GLP-1 receptor agonist, liraglutide, reduce significant cardiovascular (CV) events and mortality (Lai et al., 2021). Hence, in patients with CV disease, these drugs should be considered next. For patients with T1DM, a regime of

basal-bolus insulin is the mainstay of therapy. Also, insulin pump therapy is a reasonable choice. Since hypoglycemia portends increased mortality, preference should be given to therapies that do not induce hypoglycemia, for example, DPP-4 Inhibitors, SGLT-2 inhibitors, GLP-I receptor agonists, and pioglitazone with metformin. The other advantages of SGLT-2 inhibitors and GLP-I receptor agonists are a reduction in body weight, blood pressure (BP), and albuminuria (Eckstein et al., 2021).

To reduce microvascular complications in the majority, the goal Hb A1C should be less than 7%. Also, the BP goal should be less than 130/85 mmHg with a preference for angiotensin-converting enzyme (ACE)/angiotensin receptor blocker (ARB) therapy. Fundal exams should be undertaken as proposed by guidelines and urine albumin excretion at least twice a year (Massey et al., 2021)

For the lipid panel, the goal should be an LDL-C less than 100 mg/dl if no atherosclerotic cardiovascular disease (ASCVD) or less than 70 mg/dl if ASCVD present. The drug of choice is a statin since these drugs reduce CV events and CV mortality. Consider adding ezetimibe and PCSK9 inhibitors for patients with ASCVD who are not at goal (Shah et al., 2021).

Differential Diagnosis

The list of differential diagnosis of diabetes mellitus consists of various conditions that would exhibit similar signs and symptoms (Petersman et al., 2019):

- Drug-induced signs and symptoms due to corticosteroids, neuroleptics, pentamidine, etc.
- Genetic aberrations in beta-cell function and insulin action
- Metabolic syndrome (syndrome X)

- Infection
- Endocrinopathies such as acromegaly, Cushing disease, pheochromocytoma, hypothyroidism, etc.
- Complications of iron overload (hemochromatosis)
- Conditions affecting the exocrine part of the pancreas such as pancreatitis, cystic fibrosis, etc.

Complications

Persistent hyperglycemia in uncontrolled diabetes mellitus can cause several complications, both acute and chronic. Diabetes mellitus is one of the leading causes of cardiovascular disease (CVD), blindness, kidney failure, and amputation of lower limbs. Acute complications include hypoglycemia, diabetic ketoacidosis, hyperglycemic hyperosmolar state, and hyperglycaemic diabetic coma. Chronic microvascular complications are nephropathy, neuropathy, and retinopathy, whereas chronic macrovascular complications are coronary artery disease (CAD), peripheral artery disease (PAD), and cerebrovascular disease. It is estimated that every year 1.4 to 4.7% of middle-aged people with diabetes have a CVD event (Pataoulias et al., (2020)

Patient Education

Patients must be educated about the importance of blood glucose management to avoid complications associated with DM. Stress must be given on lifestyle management, including diet control and physical exercise. Self-monitoring of blood glucose is an important means for patients to take responsibility for their diabetes management. Regular estimation of glucose, glycated hemoglobin, and lipid levels is necessary.

Healthcare professionals should educate patients about the symptoms of hypoglycemia (such as tachycardia, sweating, confusion) and required action (ingestion of 15 to 20 gm of carbohydrate).

Patients should be motivated to stop smoking. Emphasis is required on regular eye check-ups and foot care.

Enhancing Healthcare Team Outcomes

The diagnosis and management of type 2 diabetes mellitus are with an interprofessional team. These patients need an appropriate referral to the ophthalmologist, nephrologist, cardiologist, and vascular surgeon. Also, patients need to be educated about lifestyle changes that can help lower blood glucose. All obese patients should be encouraged to lose weight, exercise, and eat a healthy diet. The primary care provider and the diabetic nurse must encourage all people with diabetes to stop smoking and abstain from drinking alcohol. The complications of diabetes mellitus are limb and life-threatening and seriously diminish the quality of life (Su et al., 2021).

Self-Care Practices of Diabetes Management

The definition of self and personal care in this disease has been defined as a revolutionary change in the progress of education or being apprised by studying to remain alive with diabetes. Since most daycare activities for diabetes are managed by the families of the patients or by the patients themselves, there is an urgent need for measures to be taken to self-control diabetes. They are monitoring blood glucose, eating a healthy diet, remaining physically active, remaining adherent to the treatment regime, taking medications on time, and reducing risk behaviors. These practices can be beneficial for physicians and educators dealing with diabetic patients as well as for researchers introducing newer measures for

diabetic care and control (Wagner et al., 2021). These self-care practices are habits developed by individuals at risk or suffering from diabetes so that the disease can be managed by themselves without much help or intervention. The six practices mentioned above have shown good outcomes in controlling blood glucose levels, reducing complications of diabetes, and maintaining and improving the quality of life. Self-care associated with diabetes requires the patient to undergo lifestyle, eating, and dietary changes with the help of physicians, which leads to a successful change in behavior and attitude with self-confidence toward dealing with diabetes (Fisher et al., 2021).

Importance of self and personal care in the treatment of diabetes Training associated with personal care and self-management of diabetes begins with the proper knowledge of instructions, which are based on the needs of the patient. A trainer or instructor that deals with diabetes makes the patient arrange, differentiate, and move ahead in the direction towards the objectives that lead to changes that will give self-confidence, lead to a better quality of life, and manage any complication. Since diabetes is a multidimensional disorder, physicians should not single-handedly give discrete measures of data and guidance (Peel et al., 2021).

Tips for personal care and self-management in diabetes mellitus

Self-care practices are a set of behavioral practices used by individuals suffering from diabetes in order to manage and control the disease on their own. These self-care practices are found to have an association with blood glucose levels and thereby reduce the incidence of complications associated with diabetes. Various studies and evidence show that when a patient performs self-care practices in a correct and systematic manner, they can improve blood sugar control. These practices have proven effective in achieving the therapeutic goals of diabetes (Cooper et al., 2023). The following tips for personal care, i.e., daily exercise, diet,

quitting smoking, foot care, fiber intake, tooth care, eye care, and stress management, will help in the self-management of diabetes. **Daily Exercise:** Physical exercise is of the utmost importance in dealing with diabetes. Daily exercise aids in the digestion of food. Daily exercise helps to control the level of blood sugar in diabetic patients (Cooper et al., 2023)

Diet: Blood sugar levels can be maintained by avoiding foods with high-calorie counts, cutting back on salt and sugar, and avoiding junk food (Paterson & Thorne, 2020).

Quit Smoking: Individuals diagnosed with diabetes mellitus should quit smoking and remain completely away from drugs because they will cause blood vessels to narrow, which will further cause a decrease in blood circulation (Paterson & Thorne, 2020).

Foot Care: Individuals suffering from DM type 2 should properly wash and clean their feet using warm water, then dry and clean them neatly. Any edema or injury to the foot has to be given the utmost observation, and consultation from a physician should be sought (Paterson & Thorne, 2020).

Intake of Fiber: Food with a high fiber content should be consumed. High fiber intake enhances the process of digestion, maintains the blood sugar level, and decreases cholesterol (Paterson & Thorne, 2020).

Tooth Care: After every meal, proper brushing and flossing of the teeth will prevent infection of the gums. Inflammation of the gums, indicating redness and swollen gums, needs immediate intervention (Paterson & Thorne, 2020).

Eye Care: Regular eye checks need to be done, failure of which will lead to retinopathy. Regular checkups can prevent this complication (Paterson & Thorne, 2020).

Stress Management: Management of stress with methods like yoga should be implemented and managed effectively because the hormones produced in response to stress lead to

improper functioning of insulin, leading to an increase in blood glucose (Paterson & Thorne, 2020) .

Self-care practices

Self-care involves intentional methods to take care of physical, emotional, and mental health. Any patient with a chronic illness may experience effects on their general health and way of life from changes in their choices and behaviors, which is the best part of personal self-care. These practices include different things that need to be taken care of, such as medicines, exercise, food, sleep, emotions, medical facilities, and care. The American Diabetes Association (ADA) mentions that keeping an eye on the intake of carbohydrates and fiber, undergoing weight loss, and cutting short the intake of cholesterol, saturated fat, trans fat, and salt are the basic things that need to be done for the treatment of this disease. Along with this, patients also require additional practices to review individual and social things for the betterment of the treatment of diabetes mellitus (Poulsen et al., 2023).

Obesity is one of the major issues for individuals suffering from diabetes mellitus type 2. Dietary changes are the principal factor in dealing with diabetes mellitus since they can lead to weight loss and ultimately help in the management of obesity, which further helps in the intervention of diabetes mellitus. There are many fewer studies done that have primarily focused on the management of obesity in children (Brown, 2021). Also, a limited number of studies have paid attention to the treatment of adolescent patients suffering from type 2 diabetes mellitus, which has included dietary control along with exercise and attitude changes. The results from these studies conclude poor and pessimistic results with respect to the influence of food on managing the end result, but independent results of diet modification were not counted. A recent study analyzing a long-term diet with reduced glycemic burden and a standardized diet with less fat in adult individuals with obesity has shown that a diet

with less fat can be a better replacement for a conventional diet with less fat for decreasing the long-term side effects of diabetes in obese patients with diabetes mellitus type 2 (Henderson et al., (2021).

Personal care with physical exercise is an internal part of managing this disease and helping with the motion of skeletal muscles (Norris et al., (2022). The goal of physical exercise is to achieve blood sugar level regulation, improve the action of insulin, improve the metabolism of protein and fat, avoid complications of diabetes, and increase life quality and expectancy. Sufficient physical exercise leads to lower levels of HbA1c. The only condition included is that it should be integrated with dietary advice. Younger generations should know the needs and significance of regular physical exercise, which helps them lose calories, reduce weight, and maintain blood glucose levels. In addition, the combined changes in diet and daily physical activity aid in balancing normal weight and increasing weight loss in individuals with obesity (Glasglow et al., 2022).

Self-care management education for diabetes

Although genetics is responsible for the development of this disease, twins with a monozygotic constitution have shown that environmental influences also play a crucial role in the progress and development of this disease. People with this disease have shown positive effects and outcomes on their development and progression of diabetes by engaging in self-care activities (Longo et al., 2020). This active participation can have a positive impact only if patients suffering from this disease and their physicians are brought to notice about undertaking effective self-care and personal care for diabetes. It is understood that people who have more information about the disease will have a better understanding of the disease, which will have positive effects on disease development and progression as well as complications arising out of it (Marrero et al., 2020).

The Association of Endocrinologists (clinical) in America depicts the significance and need for patients to remain physically active and have some sort of knowledge of their self-care activities. The Association of American Diabetes has done studies and reviewed the results of standards for diabetes self-care and personal management and understands that there is a four-fold increase in complications of diabetes in people who have not taken any advice or education related to self-care practices. A study of self-management education for individuals dealing with type 2 diabetes has shown that there is improvement in blood glucose control in the follow-up. However, this improvement in blood glucose decreases after one to three months of stoppage of self-care activities, which suggests that education on self-management is helpful in reducing glycosylated hemoglobin (Nam et al., 2021).

Education related to diabetes is crucial, but it must be inculcated in life or through self-care activities for the betterment of individuals. Self-care means activities related to diet control, increasing physical exercise, ignoring foods high in fat, monitoring blood glucose, and taking care of your feet. Reducing the levels of glycosylated hemoglobin might be the eventual target of self-management, but it can't remain the only target in the individual's care. Certain changes in personal care should be reviewed for progress and the development of a behavior change (Anderson, 2021).

Monitoring glucose levels in the blood of patients with diabetes is an important cornerstone of diabetes care and can help patients participate in achieving glycemic targets. The ultimate aim of monitoring blood glucose is the overall assessment of glucose control and taking optimal steps in time to achieve an optimal blood glucose level. Monitoring glucose levels in the blood gives information about current blood glucose levels, allowing individuals to assess their progress and undergo adjustments in medication, diet, and physical exercise so that optimal blood glucose levels can be achieved (Coyle et al., 2023). A recent survey has shown that regular physical exercise has a positive impact on improved health outcomes in diabetics,

irrespective of their weight loss. The American College of Sports Medicine and the National Institute of Health suggest that all adults, including those suffering from this disease, should perform daily physical exercise (Corser et al., 2021).

Compliance with activities related to self-care

Adherence to the treatment regimen for diabetes is an important area of interest and worry for physicians and researchers, although many studies and research have been done previously in this regard. In diabetes, individuals need to adapt to a plan and follow it strictly. This plan should comprise many behavioral changes and actions to take care of diabetes on a regular, day-to-day basis. All these changes and actions should comprise positive lifestyle changes, which include dietary planning and regular physical exercise; taking proper medications daily, which comprise insulin or oral medications that act as hypoglycemic agents as and when indicated; keeping an eye on blood sugar levels; managing symptoms related to diabetes mellitus; undertaking guidelines related to foot care; and taking care of diabetes or other problems related to health. The regimens that are already there for diabetes are complicated further since there is a need to add and integrate all these behavioral aspects into the patient's day-to-day life (Seley et al., 2021).

The maximum number of patients can effectively decrease the long-term complications arising from diabetes by improving self-care activities. But still, even if the advantage of these activities is life-saving, adherence to these self-care activities is found to be very low. In a study done and conducted on individuals with diabetes, the results showed that only 30% of individuals were adherent to the treatment regimen, and non-adherence was higher, especially among groups with lower socio-economic status. On the other hand, one part of the truth is that only sticking to type 2 diabetes self-care and personal care activities will not lead to good control of blood sugar levels. Various research studies done globally show that

control of metabolism is a combination of multiple things and not just individual adherence to self-care and personal care activities and treatment regimens. In a trial done in America, it was noticed that individuals are more likely to grasp and make changes when each change is implemented individually. Positive outcomes may therefore vary, and it depends on the changes that are made to enact them, whether singly or simultaneously (Muhama et al., 2020).

Barriers associated with self-care of diabetes

The importance of physicians and healthcare workers in the care of patients with diabetes is widely known and recognized. Various cultural barriers, such as higher costs and finances, the satisfaction of patients with degrees, an improper balance of health care providers between rural and urban regions, and socio-demographic barriers, have varied restrictions on self-care and personal care activities in progressing countries. In a survey done regarding barriers from the physician's point of view in regards to care of diabetes, various aspects like expenses and affordability by the individuals, belief and willpower from physicians that medication and treatment regimens cannot treat patients completely, and zero confidence in themselves regarding their ability to change the patient's attitude and behavior came forward. Another such study was done that focused on both patient- and physician-related factors (Muhama et al., 2020). Patient-related factors comprise social support, financial assistance behavior, attitude, education and knowledge regarding diabetes, language, and cultural capabilities, while physician-related factors include self-beliefs, knowledge regarding diabetes, attitude, and communication factors (Muhama et al., 2020).

2.2 Theoretical Review

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.

2.3.1 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.

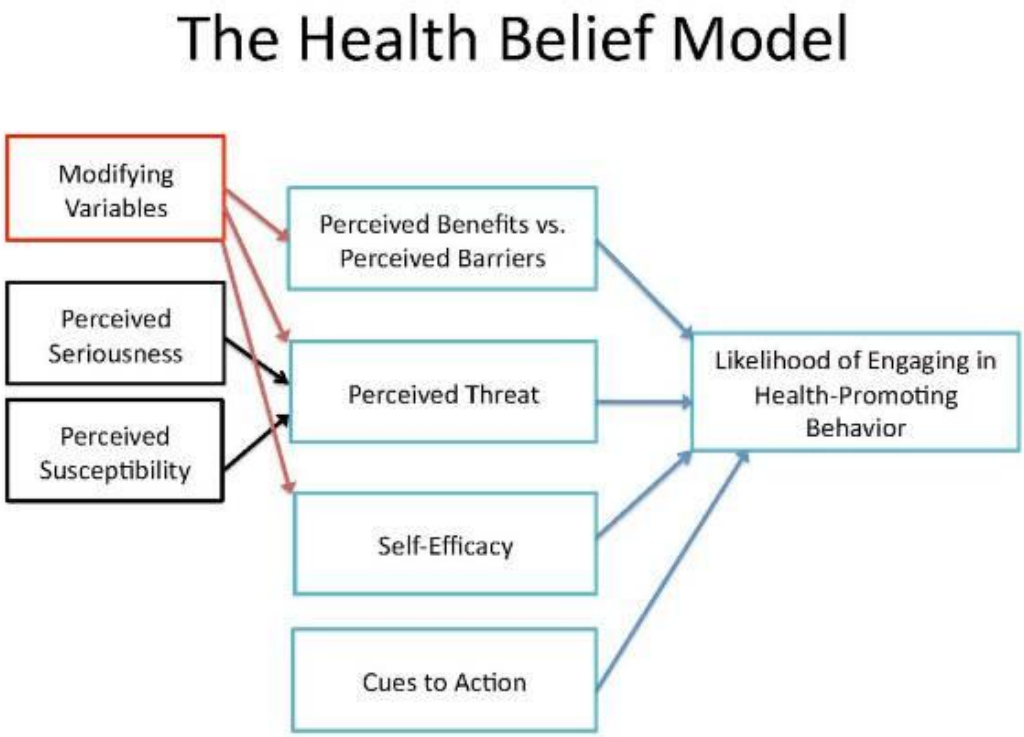

Figure 2.2 Health Belief Model

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 services 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 and selfcare practices. Finally other demographic factors may influence perception of diabetes management and selfcare practices 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 towards diabetes management and selfcare practices than an uneducated man, and also the individual knowledge towards the disease may influence his compliance to diabetes management and selfcare practices.

2.3 Empirical Review

Knowledge of Diabetes Mellitus among diabetic patients

A study by Kumar et al., (2023) on Knowledge and Awareness About Diabetes Mellitus Among Urban and Rural Population Attending a Tertiary Care Hospital in Haryana, a hospital-based cross-sectional study conducted at a tertiary care hospital on diagnosed cases of DM. Informed consent was taken from the patients, and all the required details were obtained using a well-structured questionnaire. After obtaining all the answers, the level of knowledge and awareness was analyzed, and the data was entered into an MS Excel sheet (Microsoft, Redmond, Washington) and analyzed by Statistical Package for the Social Sciences (SPSS) version 22.0. The findings from this study revealed that the maximum prevalence of diabetes was seen in males (55.5%) than females (44.5%), and the mean age of our study population was 53.3 ± 16.4 years. In this study, participants from rural areas made up the majority (59%) compared to those from urban areas (41%), and the majority of participants had a high school education. Among 211 diabetics, about 84%, 79%, and 41% of the patients knew about diabetes, symptoms of diabetes, and complication of diabetes. Only 18% of the patients were aware of the symptoms of hypoglycemia, and 38% of the patients possess their own glucometers and monitor their blood sugar levels on a regular basis. Merely 38% of the diabetics were aware of the various DM treatment choices. About 52% of patients had some awareness of insulin therapy. Out of 211 patients, about half skipped their antidiabetic prescriptions, and of those, 22% took a double dose the next day. A total of 121 patients (57%) combined the use of alternative and allopathic medications, and among these, 22% of patients had replaced the allopathic with alternative medicines. Almost 53% of patients had a positive family history of diabetes; 54% of patients believe that obesity is unrelated to diabetes, and 79% of diabetics are aware of the lifestyle changes that must be done for diabetes. Almost 67% of the patients believed that diabetes could be permanently

treated, and 84% of patients believed that eating too much sugar caused their diabetes. The study concluded that a significant number of patients suffering from diabetes had less knowledge and awareness about it. The prevalence of myths about the onset of diabetes was noticeably higher among diabetic patients. The study also observed that a greater number of patients were shifting to alternative medications instead of allopathic ones, and in the long run, it can lead to various complications. Therefore, there is an immediate need to promote awareness about diabetes among the general population.

Another study by Mahzari et al., (2022) on Knowledge, Attitude, and Practice Regarding Diabetes Mellitus Among Type 2 Diabetic Patients Attending Primary Health Care Centers in the Jazan Region of Saudi Arabia, a cross-sectional study among patients with type 2 diabetes mellites (T2DM) in the Jazan region of Saudi Arabia was conducted to assess Saudi adults' knowledge, attitude, and practice (KAP) regarding the disease. The patients participated in the study by filling in a questionnaire. Data analysis was carried out using R software, version 4.0.5 (R Studio: Integrated Development for R, Boston, MA) and the analysis included general sample demographics. KAP scores were the dependent variables. Following the sample description, regression analysis was performed to examine the adjusted relationships between KAP factors and independent variables. The impact of all independent variables on KAP variables was examined using multiple linear regression analysis. A p-value of less than 0.05 was considered significant, and the beta coefficient was applied to estimate the associations between the independent variables and the KAP variables. The findings from the study revealed that the mean duration of having T2DM was 7.63 ± 7.19 years. More than half of the study participants had a degree (58.49%), and nearly half were employed (42.45%). Married participants had higher knowledge and attitude scores than single and divorced or widowed participants (9.19 ± 3.38, 80.14 ± 14.72, respectively). In comparison, divorced or widowed participants had higher practice scores than single and

married participants (16.35 ± 7.42). Participants with higher education attainment had higher knowledge and attitude scores than those with no degree (9.54 ± 3.39, 80.58 ± 17.57, respectively), whereas participants with no degree demonstrated higher practice scores (16.85 ± 8.3) than those with degrees. The study revealed that the participants' knowledge is insufficient in 51.2% and sufficient in 48.8% of the participants. Of the participants, 7.8% were found to have negative attitude levels and 92.2% were found to have positive attitude levels. Finally, study participants' practice levels were found to be negative in 24.8% and positive in 75.2% of participants. This study revealed that patients have gaps in their knowledge, attitude, and practice in regard to T2DM. In this study, associations and correlations were established between KAP scores and the sociodemographic characteristics of the patients.

A study on Knowledge towards diabetes and its chronic complications and associated factors among diabetes patients in University of Gondar comprehensive and specialized hospital, Gondar, Northwest Ethiopia by Zemene et al., (2022), a cross-sectional study was employed at the diabetic care service of UoGCSH from August 1, 2021–September 10, 2021. Interview-guided self-administered questionnaire and a chart review were used for data collection. Univariate and multivariate logistic regression was computed to know the association between variables. The findings from this study revealed that the knowledge score regarding diabetes was 85.6% whereas the knowledge score about the chronic complications of diabetes was 58.8%. Age being 26–45 years old (AOR = 0.333,95% CI:0.12–0.918), educational status being able to read and write (AOR = 0.253, 95% CI:0.094–0.683), duration of diabetes diagnosis greater than 10 years (AOR = 2.827, 95% CI:1.458–5.481), and occupational status of being a daily laborer (AOR = 2.531, 95% CI:1.030–6.221) were significantly associated with knowledge regarding chronic complications of DM. The study concluded that the respondents demonstrated higher knowledge scores regarding DM and its

chronic complications. Age, educational status, duration of diabetes diagnosis, and occupational status have a significant association with knowledge of subjects regarding chronic complications.

A study on Alaofe et al., (2021) on Knowledge, attitude, practice and associated factors among patients with type 2 diabetes in Cotonou, Southern Benin, a cross-sectional study was conducted from July to August 2019 among 300 diabetic patients from four health centers. Data was collected using validated questionnaires. KAP levels were determined by calculating the scores, and multivariate logistic regression was used to explore factors influencing KAP scores. The findings from this study revealed that about 53, 52, and 47% of all patients had good knowledge, attitude, and practice towards diabetes. In logistic regression, factors such as being female, married, educated, government/non-government employee, and longer duration of diabetes were significantly associated with good knowledge. Being married, having a longer duration of diabetes, and good knowledge were significantly associated with a good attitude while being educated, having a longer duration of diabetes, and good knowledge with good practice. The study concluded that lack of knowledge, poor attitude, and inadequate practice were found in this surveyed community, suggesting a need for structured educational programs to assist diabetic patients. However, the study recommended that education should be considered a priority for male, newly diagnosed, and uneducated patients.

A study by Luambano et al., (2023) on Knowledge about diabetes mellitus and its associated factors among diabetic outpatients at Muhimbili National Hospital in Tanzania, a cross-sectional study was conducted among 220 diabetic outpatients aged 18 years and above at Muhimbili national hospital in Tanzania between February and April 2017. Data were collected using a structured pretested questionnaire and were entered into Microsoft Excel and exported to SPSS Version 20 for analysis. Bivariate and multivariate logistic regression

was used to determine the predictive variables. The significance of independent variables was declared at a 95% confidence level and p-value < 0.05. The findings from the study revealed that a total of 137 (64.01%) of the participants had adequate knowledge about diabetes mellitus. The majority (86.9% and 85.1%) reported having adequate knowledge of complications of diabetes and treatment options for diabetes respectively. The least level of knowledge reported was on signs and symptoms (48.6%) and type of diabetes (32.7%). The majority (54%) cited health facilities as the most common sources of information related to diabetes. Both bivariate and multivariate logistic regression analyses showed that there was a statistical association between knowledge related to diabetes and the level of education of study participants. The overall level of knowledge of participants about diabetes mellitus is was adequate, with a low level of knowledge related to signs and symptoms of diabetes, and type of diabetes. The findings from the study equally revealed that health facilities were the most common sources of information related to diabetes. The study recommended that policy and decision-makers and health care providers should take collective action to improve community knowledge about diabetes. Health education related to diabetes should be integrated into the educational curriculum at all levels in Tanzania, which would massively increase awareness of diabetes.

A study by Sewoski et al., (2022) on Public knowledge and awareness of diabetes mellitus, its risk factors, complications, and prevention methods among adults in Poland, this cross-sectional survey was a non-probability random quota sample of 1,051 adults in Poland. The questionnaire included ten questions related to the awareness of risk factors, symptoms, and complications of diabetes. The findings from the study revealed that among the respondents, 10.5% had diabetes and 43.8% declared that they have a history of diabetes in their family. Only 17.3% of respondents declared a good level of knowledge of diabetes. Out of 10 symptoms of diabetes analyzed in this study, high blood sugar (80.7%) and chronic fatigue

(74.6%) were the most recognized. Out of 8 diabetes risk factors analyzed in this study, overweight/obesity (80.4%) and unhealthy diet (74.1%) were the most recognized diabetes risk factors, while only 22.7% of respondents indicated tobacco use. The diabetic foot was the most recognized diabetes complication (79.8%), but approximately half of the respondents indicated vision problems (56.9%), kidney damage (52.1%), or cardiovascular diseases (50.2%) as diabetes complications. Female gender, having higher education and having a family member with diabetes were the most im-portent factors associated ($p < 0.05$) with a higher level of awareness of diabetes. The study demonstrated insufficient public awareness of diabetes among adults in Poland. Gender and educational level were the most important factors significantly associated with the awareness of the selected aspects of diabetes, while self-reported financial situation and place of residence had none or marginal influence. The presented data manifest the importance of adopting a comprehensive education strategy regarding diabetes in Poland.

Another study by Ferreira et al., (2024) on Knowledge about type 2 diabetes: its impact for future management, The sample included a total of 1,200 persons, of whom almost half were female. The age range of the participants varied from 24 to 94 years old, and the mean age was 65.6 ± 11.4 years. Most of the sample had a level of education under secondary and lived with someone. The findings from the study revealed that 479 (39.9%) were insulin-treated. The percentage of correct answers was 51.8% for non-insulin vs. 58.7% for insulin treated ($p < 0.05$). There were three items with a percentage of correct answers lower than 15%; the item with the lower value of correct answers was the one related to the identification of signs of ketoacidosis with only 4.4% of correct answers, the errors presented a random pattern; the item related to the identification of which food should not be used to treat low blood glucose with 11.9%, where 56.9% of the sample's participants considered that one cup of skim milk would be the correct answer (53.1% in non-insulin patients and 62.6% in insulin treated

patients; $p < 0.001$). The item regarding the knowledge of free food presented a 13.3% of correct answers (10.8% non-insulin group vs. 17.1% insulin group; $p < 0.01$). Two of the three items with lower value of correct answers were related to glycemic control and health status monitoring, the other was related to diet and food.

Another study by Qasim et al., (2022) on Knowledge About Various Aspects of Diabetes Among Known Diabetic Patients attending Diabetic Clinic at Pakistan Institute of Medical Sciences Hospital, Islamabad, during this descriptive cross-sectional study data were collected from 200 patients through a self-structured questionnaire. Patients was questioned about their demographic information as well as their personal and diabetes-related history. Participants were asked to respond to each question in the questionnaire using

their knowledge and understanding. Data were obtained in frequency and percentage to examine socio-demographic variables. Results: In the current study, more females, 108 (54 %) contributed in the study as opposed to males, 92 (46 %). The findings from the study revealed that 170 (85%) of diabetic patients had type 2 diabetes, 24 (12.0%) were suffering from type 1 diabetes, and 6 (3.0%) had Gestational diabetes mellitus GDM. The study concluded that there was considerable knowledge about diabetes in known diabetic patients but still there is a dire need to increase knowledge and awareness regarding disease understandings, causes, complications, management, and its preventive measures.

A study by Siddiqui et al., (2024) on Assessment of knowledge of diabetes among diabetic and non-diabetic individuals, the descriptive cross-sectional study was conducted at PNS Shifa Hospital, Karachi. All outpatients diabetics of either gender between ages

20-80 years were included. The non-diabetic individuals that were included in the study were general walk-in patients aged >18 years. The sampling technique was non-probability

convenience sampling. Diabetic Knowledge Questionnaire was adapted and modified was used. Questionnaire was completed by 201 respondents out of which, 100 were diabetics and

101 were non-diabetics. The patients with diabetes were older in 51-60 years group, were more males, and most had tertiary education, while among the non-diabetics, the age group with most respondents was in the age group of 41-50 years, more were males, and most had secondary level of education. The findings from the study revealed that both diabetic (93%) and non-diabetic (81.2%) group had knowledge of diabetes

(p=0.035). The study concluded that the level of knowledge of diabetes in both diabetic and non-diabetic groups was acceptable except in one situation where both groups thought that mental stress and

hypertension contributes to diabetes. Non-diabetic group did not know about the levels of blood glucose as compared to diabetic .

A study by Mousavi et al., (2021) on Knowledge, Attitude, and Practice of Diabetes Mellitus, A convenient sampling method was used to select 384 of every single person who was admitted to a research, educational and medical center, in the western north of Tehran, in 2018. KAP questionnaire on diabetes was completed, and the level of KAP was evaluated in diabetic and non-diabetic people using SPSS software.

The findings from the study revealed that the overall mean (± SD) of the knowledge, attitude, and practice was 12.13 ± 3.84, 5.52 ± 5 and 10.68 ± 51.96, respectively. Several linear regressions in the two groups for the total knowledge scores, total attitudes scores, and total practice scores displayed several significant (adjusted) associations. The results of this study showed that we need to increase the knowledge and attitude of patients with diabetes about a healthy lifestyle, including regular exercise, a healthy diet, and weight loss.

A study by Adkhari et al., (2023) on Assessment of the level of knowledge about diabetes mellitus among diabetic patients, a descriptive cross-sectional study using a translated Nepalese version of the revised Michigan Diabetes Knowledge Scale was conducted among randomly selected patients with diabetes mellitus presenting to the outpatient department (OPD) of Madhyabindu Hospital, Nepal. Data were collected via an interviewer administered questionnaire and analyzed with MS Excel 2016 and IBM SPSS version 25 software. The findings from this study revealed that among the 360 participants, 27.2% had good knowledge of diabetes and 72.8% had poor knowledge. Age, level of education, occupation, family history of diabetes, duration of the disease, presence of comorbidity, complications and body mass index (BMI) were significantly associated with knowledge of diabetes mellitus. The study concluded that it is important that diabetes self-management education and support (DSMES) programs should be implemented and/or strengthened at the Madhyabindu Hospital and targeted communities to improve diabetes patient's knowledge on their disease condition and self-care practices.

A study by Alenazi et al., (2020) on Knowledge and Awareness of Diabetes Mellitus Disease among High School Students in King Abdulaziz Military City, Tabuk, Saudi Arabia, a descriptive type of cross-sectional study was conducted among 278 high school students applying a convenience sampling technique. The sample size was calculated using OpenEpi, Version 3. Self-administered questionnaires were distributed to the high school students (male and female) after official communication with the school's dean. The level of knowledge and awareness was categorized into "adequate" and "inadequate" as per each topic/question, and also as per each response/answer. Data entry and analysis were carried out using the Statistical Package for the Social Sciences. Pearson's Chi-square tests were performed to explore if there is any significant association between the knowledge and awareness level of the high school students and their (i) gender, (ii) age, and (iii) level of

education. The findings from the study revealed that more than half of the high school students had adequate level of knowledge and awareness about DM in terms of symptoms (67.3%), complications (56.5%), monitoring method (62.6%), lifestyle modifications (63.7%), frequency of routine eye check-up (63.3%), important factors for blood sugar control (79.1%), treatment (56.5%), and management of hypoglycemia symptoms (57.6%). On the contrary, a large number of the students showed inadequate level of knowledge and awareness about the disease in terms of definition (80.6%), major causes (57.9%), effect of high blood pressure (51.8%), frequency of routine blood pressure check-up (55%), rationale of a regular urine test (58.3%), medication for DM (66.9%), and duration of medication (69.8%). However, no significant associations were found between the knowledge and awareness level of the high school students about the definition or major causes of DM and the (i) gender, (ii) age group, and (iii) level of education of the students.

The study concluded that the level of knowledge and awareness of a considerable number of high school students regarding DM was inadequate, and some of them possessed various misconceptions about this particular chronic disease. Health authorities and school authorities in the region should offer special efforts to improve the level of knowledge and awareness of the students through regular health education campaigns.

Self-Care Practices of Diabetic Patients

A study by Zewdie et al., (2022) on Self-Care Practice and Associated Factors Among Patients with Type 2 Diabetes Mellitus at a Referral Hospital in Northern Ethiopia, the study employed parallel mixed methods design which followed a cross-sectional interview and in-depth interview methods, respectively, from September to October 2019. The collected data were subjected to descriptive and inferential analysis for the quantitative part and a thematic analysis for the qualitative part. The findings from this study revealed that 50.3% reported

good self-care practice. Being in the age category of 60–69 years old (AOR = 0.334, 95% CI (0.135, 0.951)), being ≥70 years old (AOR = 0.359, 95% CI (0.135, 0.951)), having complications (AOR = 1.956, 95% CI (1.172, 3.262)), having co-morbidity (AOR = 0.443, 95% CI (0.262, 0.749)) and diabetes education (AOR = 2.684, 95% CI (1.633, 4.412)) were significantly associated with good diabetes self-care. Accessibility, social support, knowledge and beliefs and diabetes-related morbidities were identified as barriers to diabetes self-care by the patients. The findings from this study revealed that only half of the type 2 diabetes patients who participated in this study reported good self-care practice. Different factors, including diabetes education, were significantly associated with good diabetes self-care according to the quantitative study. This was supported by the findings from the qualitative part and thus the recommendation to strengthen diabetes health education to patients and their families.

A study on Self-care practice and its predictors among adult diabetic patients on follow-up at public health care diabetic referral clinics, Debre Markos, Ethiopia by Bayable et al., (2022), a cross-sectional study was conducted from November to January 2021/2022, on diabetic patients who were on follow-up. Data were collected and checked for its completeness, then coded, and entered using *EPI* data version 4.4.2, and analyzed using SPSS version 22. Finally descriptive statistics were presented using tables, graphs, and texts. In addition all independent variables with $P \leq 0.2$ in the bi-variable logistic regression analysis were analyzed by multivariable logistic regression with 95 % CI at 5 % margin of error and a p-value < 0.05 was declared as statistical significance. The findings from this study revealed that out of the total 239 respondents 48.5 % of the study participants had good diabetes self-care practices. Diabetic patients who had college and above level of education were 1.41 times (AOR: 1.41, 95 % CI 0.54–3.65) more likely to have good self-care practice than those who were under diploma level of education. The odds of good diabetic self-care practice

were 1.36 times (AOR: 1.36, 95 % CI 1.41–3.43) higher among respondents who were governmentally employed than those who are not employed. Study participants who were rural residents were 29 % (AOR: 0.71, 95 % CI 0.40–2.23) less likely to practice self-care habits than those urban residents of DM. Participants who were on the follow-up for less than one year were 47 % (AOR: 0.57, 95 % CI 0.12–2.46) less likely to have self-care practice than those patients who had been on follow-up for more than ten years. The findings from this study revealed that the overall level of self-care practice among diabetic patients was low as compared to the previous study findings, so diabetic patients require intervention with an integrated approach through treatment as well as health education which will increase the health and well-being of the patients. The study concluded that employment, level of education, residency, and length of diabetic treatment were strongly associated with self-care practice of diabetes mellitus.

Another study on Poor self-care practices and contributing factors among adults with type 2 diabetes in Adama, Ethiopia by Bekele et al., (2024), an institution-based cross-sectional study was conducted among 404 patients. Self-care practice was assessed by the summary of diabetes self-care activities questionnaires. Binary logistic regression was used to identify factors associated with poor self-care practices. An adjusted odds ratio with a 95% confidence interval was used to assess the strength of associations. The statistical significance was declared for a p-value < 0.05. The findings from this study revealed that the proportion of poor self-care practices was 54% [95% CI 49.1, 58.6]. Being divorced (AOR = 3.5; 95% CI 1.0, 12.2), having a lower level of knowledge (AOR = 1.70; 95% CI 1.0, 2.8), being on insulin (AOR = 6.3; 95% CI 1.9, 20.6), taking oral medication (AOR = 8.6; 95% CI 3.0, 24.5), being unaware of fasting blood sugar (AOR = 2.9; 95% CI 1.6, 5.2), not a member of a diabetic association (AOR = 3.6; 95% CI 1.7, 7.5), a lack of social support (AOR = 2.9; 95% CI 1.7, 4.9), and having a poor perceived benefit of self-care practices (AOR = 1.84; 95% CI

1.0, 3.2) were associated with poor self-care practices. Overall, this finding demonstrated that a significant percentage of participants (54%) had poor self-care practices. Being divorced, having a low level of knowledge about diabetes and fasting blood sugar, lacking social support, relying on oral medication, perceiving limited benefits from self-care practices, and not being a member of diabetic associations were identified as independent factors of poor self-care.

A study by Enikuomehin et al., (2021) on Pattern of Self-Care Practices among Type 2 Diabetes Patients in Southwest, Nigeria, a cross-sectional, descriptive, multi-center study was conducted among 348 type 2 diabetes patients selected from six tertiary hospitals in Southwest Nigeria. Descriptive statistical analysis was employed for categorical and continuous variables and multivariable logistic regression assessed association between determinant factors and adherence to self-monitoring of blood glucose (SMBG). The findings from this study revealed that of the study participants, 83.1%, 66.9%, 28.4%, and 27.9% adhered to prescribed medications, physical exercise, had meal plans incorporated into their diabetes management and SMBG, respectively. There was a statistically significant association between male gender, duration of diabetes, and previous episode of hypoglycemia with adherence to SMBG practices while lower educational level and use of insulin were associated with less likelihood of adherence to prescribed medications. The study concluded that the degree to which individuals with diabetes adhered to recommended self-care practice components were less than satisfactory especially SMBG, physical activity, and having meal plans.

A study by Gamlath et al., (2023) on Exploring Self-Care Management Practices among Patients Diagnosed with Type 2 Diabetes Mellitus at District General Hospital in Chilaw, Sri Lanka, this study aimed to evaluate self-care practices among type 2 diabetic patients, using the validated Summary of Diabetes Self-Care Activities scale (SDSCA), and to analyze

associations with age, gender, education, and socioeconomic status. This cross-sectional study was conducted at District General Hospital Chilaw, Sri Lanka, and involved 187 participants. Data analysis employed SPSS version 25. The findings from this study highlighted suboptimal self-care behaviors and medication adherence, emphasizing the need for integrated interventions to enhance knowledge and self-care among “Type 2 Diabetes Mellitus” patients.

Another study on Assessment of self-care practice amongst patients with type II diabetes attending Adama Hospital Medical College, Ethiopia by Gemeda & Woldemariam, (2022), the survey was performed using the diabetes mellitus self-Management questionnaire, which consists of four domains Physical activity, Physician contact, Medication adherence, glucose management and dietary management of the patients. The data was analyzed using Statistical Package for Social Science (SPSS) version 20.0. Descriptive statistics was performed. Fisher's Exact Test was used to determine the presence of association between adherence to self-care behavior and other variables. P-value less than 0.05 determines statistical significance. The findings from this study revealed that majority (63.4%) of respondents do not perform self-monitoring of blood glucose (SMBG). Out of a total of 93 participants, 48 (51.6%) respondents adhered to insulin therapy. Sixty-two (66.7%) adhered to recommended diet management practice, 57 (61.3%) did not adhere to physical activity recommendations and 59 (63.5%) participants adhered to overall self-care practice (DMSQ). The study concluded that although the importance of self-care practices in the management of diabetes were recognized to be useful and effective for achieving glycemic control and preventing serious diabetes complications, most patients had not adhered to self-care practice especially in terms of SMBG and physical activity. Overall (DSMQ) adherence to self-care practice was optimal amongst type II diabetes patients in AHMC Chronic care unit.

A study by Jyotsana et al., (2024) on Self-care practices and influencing factors among type 2 diabetes mellitus patients: A hospital-based cross-sectional study included 93 T2DM patients. Self-care activities were assessed using the Summary of Diabetes Self-Care Activities (SDSCA) scale. Descriptive statistics and comparative analyses were performed. The findings from the study revealed that the majority of the participants were male (55.9 %) and over 60 years of age (67.7 %). Participants demonstrated high adherence to medication regimens (mean score = 6.66 ± 0.86). However, adherence to other self-care practices was significantly lower; only 11.8 % reported good dietary behavior, 55.91 % engaged in regular exercise, and 50.5 % performed regular foot care. While 83.8 % reported good monitoring behavior, this contradicts the low adherence to blood glucose testing (mean score = 0.38 ± 0.59). Participants aged <60 years tended to report slightly better adherence to blood glucose testing than those aged ≥60 years. This study revealed a gap in self-care practices among T2DM patients in Gujarat. Despite good medication adherence, the patients demonstrated poor adherence to diet, exercise, and foot care. These findings emphasize the importance of customized interventions to improve self-management education and support, particularly for older adults.

A study by Chittoru et al., (2022) on Self-care practices and its determinants among diabetic population in rural Andhra Pradesh, India: a cross-sectional study was conducted among the known diabetics in a rural PHC between November 2018 and October 2019. Self-care practices among the registered diabetes patients were described in seven domains as recommended by the American Association of Diabetes Educators (AADE). Risk factors were identified using univariate, followed by multivariate logistic regression. The risk for poor self-care score was expressed in odds ratio (OR) with 95% confidence interval (CI). The findings from the study revealed that a total of 727 participants were recruited for the study. The mean age of the participants was 57 years (SD: 9.5 years). The self-care was prominent

in diet modification, physical activity, and physical activity components. The median self-care score of the participants was 14 (IQR = 12.5 to 15.5). 32.6% (95% CI: 31.6%–33.6%) participants had good self-care scores. With multivariate regression analysis, we found that widowed/separated (aOR 1.85, 95% CI: 1.2–3.0) was a risk factor for poor self-care scores; and skilled workers (aOR 0.28, 95% CI: 0.1–0.6) had a significantly lower risk compared to the unskilled workers. The study concluded that overall, self-care practices are poor in problem-solving, risk reduction and healthy coping behaviours. Low education and poor socio-economic status could be the most likely reasons for poor self-care practices.

A study by Dedefo etal., (2020) on Self-care practices regarding diabetes among diabetic patients in West Ethiopia, a total of 252 study participants were included in the study, of this 54.8% were male. The findings from the study revealed that more than half 150 (59.5%) had poor glycemic control and 153 (60.7%) of the participants had good self-care. Majority of the study participants 209 (82.9%) had adequate foot care and more than half 175 (69.4%) and 160 (63.5%) had adequate dietary plan and exercise management respectively. However of the total diabetic patients only 38 (15.1%) had adequate blood glucose testing practices. On multivariable logistic analysis poor self-care practices were more likely to occur among male patients (AOR = 5.551, 95% CI = 2.055–14.997, p = 0.001), patients living in rural area (AOR = 5.517, 95% CI = 2.184–13.938, p < 0.001), patients with duration of diabetes < 6 years (AOR = 41.023, 95% CI = 7.373–228.257, p < 0.001), patients with no access for self-monitoring blood glucose (AOR = 9.448, 95% CI = 2.198–40.617, p = 0.003), patients with poor knowledge about diabetes (AOR = 67.917, 95% CI = 8.212–561.686, p < 0.001) and patients with comorbidities (AOR = 18.621, 95% CI = 4.415–78.540, p < 0.001).

Factors Influencing the Self Care Practices of Type-2 Diabetes Mellitus Patients

A study by Joshi et al., (2022) on Factors influencing adherence to self-care practices among patients of type 2 diabetes mellitus from Saurashtra region of Gujarat: A conclusive research. A community based cross-sectional study was conducted among 178 type 2 DM patients. Self-care practices were evaluated for the last seven days and each item was scored from 0 (none of the days in a week) to 7 (all 7 days were followed). The findings from the study revealed that the dherence to medication (89.3%) and blood glucose monitoring (65.2%) were relatively higher than other domains. Factors associated with dietary adherence were secondary level education and above (OR = 22.1, 95% CI = 6.85 to 71.3), physician or endocrinologist treating doctors (OR = 3.36, 95% CI = 1.24 to 11.32), joint and three-generation family (OR = 3.32, 95% CI = 1.23 to 8.92) and upper and middle socioeconomic class (OR = 2.5, 95% CI = 1.1 to 6.2). Good glycemic control was significantly associated with dietary adherence (OR = 6.81, 95% CI = (2.71 to 17.16), medication adherence (OR = 4.59, 95% CI = 1.3 to 16.24) and regular exercise (OR = 3.65, 95% CI = 1.62 to 8.19). The study concluded that there is need to develop structured diabetes self-care education programs with involvement of private practitioners as a majority of the patients consult private practitioners for treatment. Health educators might have to place emphasis on self-care education to patients as well as caregivers belonging to low socioeconomic class and having lower education.

A study by Okafor et al., (2024) on Self-Care Practices and the Associated Socio-Demographic Variables of Persons with Type 2 Diabetes Mellitus (T2dm) in Southeast, Nigeria, A cross-sectional study involving 382 persons with T2DM proportionately selected from 4 tertiary health institutions in South Eastern, Nigeria. Data was collected using the Summary of Diabetes Self-Care Activities (SDSCA) and a researcher-developed questionnaire. The questionnaire was administered to persons with T2DM who attended a

diabetic outpatient clinic. Data collected was analyzed in frequency percentage. Responses on SDSCA were ranked and rated as poor, moderate, and good self-care behavior. The level of significance was placed at $P < .05$. The findings from the study revealed that the majority of the participants were within the age groups of 40 to 59 (46.9%) and 60 and above (46.9%); the majority (74.6%) were married while a good proportion were traders (59.7%). Also, the majority of participants (81.2%) were on oral hypoglycemic agents. Findings further showed that a good proportion (51.3% and 89.8%) of study participants had good self-care behavior in diet and medication domains respectively. Whereas the proportion of participants with poor self-care behavior was very high in foot care (75.1%) and fairly high in both self-blood sugar testing (37.7%) and exercise (37.2%) domains. Only 7.9% practiced 3-monthly laboratory blood glucose testing while 16.5% went for eye checks every 6 months. The study concluded that individuals with diabetes mellitus have poor self-management behavior in most domains of the self-management practice. Age, gender, marital status, educational level, and occupation significantly influenced self-management practices. Hence nurses and health educators should take diabetes self-management education very seriously to help diabetes sufferers improve their self-management behavior

A study on Zarei et al., (2022) on Investigating the factors affecting self-care behaviors in diabetic patients: A systematic review Google Scholar, SID, Scopus, PubMed, Science Direct, and ISI databases were used; 17,500 articles were found including the keywords “self-care”, “diabetes” and “affecting factors” in the search process, and all studies after 2010 were included. After reviewing the titles and abstracts, 51 studies were included. The studies’ reports on selfcare behaviors and their prevalence were very different depending on the tools used. The studies show the relationship between selfcare behaviors in patients with diabetes and various factors, including demographic, socio-economic, and psychological factors. The most important variables included are educational status, age, gender, marital status, BMI,

occupational status, duration of illness, comorbidities, income, having glucometer, perceived severity of the disease and its complications, perceived barriers, diabetes distress, diabetes knowledge, perceived susceptibility, self-efficacy, social and family support, depression, and anxiety. Due to the relationship of demographic, socio-economic, and psychological factors with self-care behaviors in patients with diabetes, it is suggested that a comprehensive program for the management of caring behaviors in diabetic patients should be designed to include all of the above.

A study by Kassie et al., (2024) on Self-care practices and its associated factors among adult diabetes mellitus patients in public hospitals of Sidama region, Southern Ethiopia: a cross-sectional study, a health facility-based cross-sectional study was conducted from March to April 2021 in the Sidama region public hospitals. A systematic random sampling technique was used to select 437 diabetic patients. The data were entered using Epi data version 3.1 and analyzed using SPSS version 25. A binary logistic regression analysis was performed, and variables with a p-value <0.05 were considered statistically significant. The findings from the study revealed that 48.9% of participants had a good level of self-care practice. College graduates and above [AOR: 4.4, 95% CI (1.87, 10.4)], those with strong social support [AOR: 4.6, 95% CI (2.3,10.5)], attendees of health education [AOR: 2.33, 95% CI (1.38,4.6)], those who were on oral hypoglycemic drug [AOR: 0.45, 95% CI (0.24, 0.83)], those who perceived the benefits of self-care [AOR: 0.46, 95% CI (0.25,0.84)], and those who perceived the severity of complications [AOR: 0.56, 95% CI (0.29, 0.77)] were predictors of diabetes self-care practices. The study concluded that a large number of diabetes patients had inadequate self-care practices. Therefore, it is important to strengthen and establish support systems, such as collaborating with healthcare providers, enlisting the support of family members, and providing health education to improve self-care practices.

A study by Kobamo et al., (2024) on Self-care practice and associated factors among patients with diabetes on follow-up at Yirgalem General Hospital, Sidama, Ethiopia: a cross-sectional study, An Institution-based cross-sectional study was conducted from February 15 to May 10, 2022, involving 298 patients with diabetes on follow-up at Yirgalem General Hospital. A pre-tested interviewer-administered questionnaire was utilized to collect data from patients. A descriptive analysis was conducted to determine the level of good self-care practice. Bivariate and multivariable binary logistics regression were performed to determine factors associated with good diabetic self-care practice. Associations with a p-value < 0.05 were considered statistically significant.

The findings from this study revealed that the overall good diabetic self-care practice among patients was 59.4%. Regarding the specific domains of care, 15 (5%) participants had good self-glucose monitoring care, 228 (76.5%) had good exercise self-care, 268 (89.9%) had good dietary self-care, 228 (76.5%) had good foot self-care, and 260 (87.2%) had good diabetic medication adherence. Single marital status (AOR = 5.7, 95% CI: (1.418, 22.915), urban residence (AOR = 2.992, 95% CI: (1.251, 7.153)), and having a glucometer (AOR = 2.273, 95% CI: (1.083, 4.772)) were factors that were significantly associated with good diabetic self-care practice. The study concluded that good diabetic self-care practices among participants was low. Marital status, place of residence, and having a glucometer were statistically significant predictors of good diabetic self-care practices. Targeted intervention addressing those patients from rural areas to increase awareness and practice of self-care, as well as the promotion of having a glucometer at home for self-glucose monitoring is recommended.

A study by Afaya et al., (2022) on Clinical factors influencing knowledge and self-care practice among adults with type 2 diabetes mellitus, a convenience sample of 330 participants was recruited over 3-months in 2018 and data were collected using a structured instrument.

The findings from the study revealed that participants on insulin treatment modality had four times higher odds of knowledge on diabetes ($B = 4.17$, $p = 0.023$) while those on combined therapy (both oral hypoglycaemic agent and insulin) had 7.26 times higher odds of knowledge ($B = 7.26$, $p < 0.001$). Participants without medically confirmed diabetic complications had 3.66 higher odds of knowledge of diabetes ($B = 3.66$, $p = 0.002$). Participants on insulin treatment modality had a 1.4-fold higher odds of self-care practice ($B = 1.4$, $p = 0.028$). It was revealed that participants with hypertension and diabetic foot had lower odds of self-care practice ($B = -1.13$, $p = 0.021$). The study concluded that participants who were on insulin and combined therapy (tablet and insulin) had higher knowledge and better self-care practice. Self-care was significantly influenced among those with, than those without diabetic foot and hypertension as complications.

A study by Reshma et al., (2022) on Factors influencing self-care behavior of socio-economically disadvantaged diabetic patients, the present study systematically reviewed the possible factors that are influencing self-care behavior of disadvantaged diabetic patients that contribute heavily to the management of this chronic illness. Structured searches were conducted on PubMed, ScienceDirect, and manual searches on Google Scholar for articles published between the years 2000 and 2020. The review was limited to a particular time frame due to the change in WHO criteria for diagnosis and classification of abnormal glucose tolerance. Initially, 96858 articles were identified, and following the screening and full-text reading, 10 studies that met the inclusion criteria were chosen for systematic review. Seven studies had reported the factors influencing self-care behavior among disadvantaged diabetic population. Three studies had reported the importance of intervention strategies and its impact on self-care behavior among them. Findings show that self-care management of socio-economically disadvantaged people entails dimensions including diabetes knowledge, lack of physical activities, social support, lack of access to services, life disruptions, denial of illness,

societal attitudes, responsibilities, and treatment costs. It was additionally discovered that diabetes self-management support mediations are successful in drawing in lower economy patients, tending to contending life needs and hindrances to self-care, and encouraging behavior change. Taken together, future methodologically efficacious studies that establish health promoting behaviors and explorations of the factors influencing self-care behaviors of disadvantaged diabetic patients are needed.

A study by Durai et al., (2022) on Self-care practices and factors influencing self-care among type 2 diabetes mellitus patients in a rural health center in South India, this is a hospital-based cross-sectional study. Type 2 diabetes patients registered and receiving treatment from the noncommunicable disease clinic of a rural health center were administered a pretested questionnaire, developed based on different diabetes self-care questionnaires making changes as appropriate and including most aspects of self-care practices. The proportion of compliant was then cross-tabulated with background characteristics and their glycated hemoglobin (HbA1c) levels. SPSS version 16.0 was used for the analysis. The findings from the study revealed that among 390 patients with a mean age 56 years, 25.5% adhered to at least four dietary modifications, 46% were physically active, and 57% had good compliance to drugs; hypoglycemia prevention practices ranged from 21% to 51%. Except for avoiding barefoot walking (90%), other foot-care practices were followed by only a quarter of them. Among ever users, 69.2%, 64.3%, and 29.4% have quit smoking, alcohol, and tobacco use, respectively. Adherence to dietary modifications and drug compliance were associated with a lower HbA1c level of ≤7 g% ($P < 0.05$). The study concluded that the compliance to physical activity or medications is much better than dietary changes and foot-care practices. Focused education programs and monitoring during follow-up visits will improve self-care in the less adhered to aspects. Those who are adherent to dietary modifications and drugs have better glycemic control.

A study by Hu et al., (2022) on Factors influencing self-care behaviours of patients with type 2 diabetes in China based on the health belief model: a cross-sectional study, The cross-sectional study included 1140 patients aged ≥36 years with type 2 diabetes who had established health records in community health service institutions. A questionnaire was designed based on the health belief model, which mainly included perceived susceptibility, severity, benefits, barriers, effectiveness, sociodemographic characteristics and self-care behaviours. Using a multistage sampling method, 36 villages and communities were randomly selected in China. A total of 1260 patients with type 2 diabetes were contacted, but 118 refused to participate in the study. Of the 1142 participants, two were subsequently excluded, and the final number of participants included in the study was 1140 (90.5% response rate). The findings from the study revealed that the average score of health beliefs was 0.71 (SD=0.08). The logistic regression analysis showed that sex, region, perceived severity, perceived barriers and perceived benefits were related to self-care behaviours. The study concluded that perceived severity, benefits and barriers were key factors affecting self-care behaviours in patients with type 2 diabetes; health education for patients should be strengthened to improve the self-care level of patients with diabetes.

Glycemic Control of Type-2 Diabetes Mellitus Patients

A study by Bin et al., (2022) on Glycemic Control for Type 2 Diabetes Mellitus Patients: A Systematic Review, Published literature between the years 2020 to 2022 was retrieved from PubMed, Science Direct, and Google Scholar using different combinations of keywords: T2DM, Glycemic control, Poor, Good, Adequate, Inadequate, Factors, Association, and Determinants. All original articles written in the English language with full-text available and the value of glycemic control defined were included. A total of 1866 studies were retrieved. After the title, abstract, screening, and full-text screening, 12 studies were eligible. The findings from the study revealed that the prevalence of poor glycemic control was high, and it

ranged between 45.2% and 93% among the studies. The factors associated with glycemic control were stratified into four categories: personal or body-related, clinical, medication-related, and behavioral factors. There was a high prevalence of poor glycemic control in all included studies. The glycemic control was associated with various factors; some were related to the patient or medical conditions while others were related to the behavior of the patients or the medication administrated.

A study by Dinavari et al., (2023) on Glycemic control and associated factors among type 2 diabetes mellitus patients: a cross-sectional study of Azar cohort population. This cross-sectional study was conducted among the Azar cohort population and the glycemic control status of patients with T2DM was investigated. Possible risk factors including age, sex, marital status, educational level, smoking status, sleep duration, family history of diabetes and hypertension, socioeconomic status, physical activity level, and co-existence of other chronic diseases and their relationship with glycemic control status were also assessed. Multivariate logistic regression analysis was used to identify determinants of glycemic control. The findings from the study revealed that among 1,710 T2DM patients (60.2% female), the overall prevalence of poor glycemic control was 56.8%. In the unadjusted logistic regression analysis model, a low wealth score index significantly increased the risk of poor glycemic control (OR: 1.49;1.10–2.02). Variables significantly associated with poor glycemic control even after adjusting for confounding factors were first-degree family history of diabetes (OR: 1.34; 1.08–1.65), and sleep duration (OR: 1.29 ;1.02–1.62 for 6.6-8 h/d; OR:1.42;1.10–1.88 for >8 h/d). Interestingly, we found that the co-existence of ≥ 3 chronic diseases with diabetes decreased the risk of poor glycemic control. The study concluded that most of the patients with T2DM had uncontrolled glycemic control. Due to the individual and social costs of diabetes complications, it is necessary to suggest tailored and effective interventions for controlling blood glucose levels in people with diabetes.

A study by Yahaya et al., (2023) on Poor glycemic control and associated factors among patients with type 2 diabetes mellitus: a cross-sectional study, a face to face interviewer semi-structured questionnaire was administered during data collection. Binary logistic regression under multivariable analysis was used to determine the independent predictors of poor glycemic control. A total of 248 patients with T2DM were included in the analysis with mean age of 59.8 ± 12.1 years. The mean fasting blood glucose was 166.9 ± 60.8 mg/dL. The findings from the study revealed that the prevalence of poor glycemic control was 66.1% (fasting blood glucose > 130 mg/dL or < 70 mg/dL). Failure to adhere to regular follow-up (AOR = 7.53, 95% CI = 2.34–19.73, p < 0.001) and alcoholism (AOR = 4.71, 95% CI = 1.08–20.59, p = 0.040) were the independent predictors of poor glycemic control. The prevalence of poor glycemic control observed in this study was significantly high. The findings from this study concluded that emphasis should be placed on ensuring that patients have regular follow-up for their diabetes clinics and they should also continue modifying some of lifestyle behaviors including refraining from alcoholism, this can help them to have good glycemic control.

A study by Gebermariam et al., (2020) on Level of glycemic control and its associated factors among type II diabetic patients in debre tabor general hospital, northwest Ethiopia, an institution based cross sectional study. Totally, 413 diabetic patients selected by systematic random sampling. The three months average fasting blood glucose was used to determine glycemic control. Regressions were fitted to identify associated factors. A p-value <0.05 was used to declare statistical significance. A total of 398 study participants were participated in the study with a response rate of 96.4%. the findings from this study revealed that among 398 type II DM patients, 284 (71.4%) had poor glycemic control. Patient's educational status (able to read and write; AOR = 3.0, 95%CI (1.5, 5.7), (primary education; AOR = 4.5, 95%CI (1.8, 10.9), and (secondary education; AOR = 5.7, 95% CI (2.9, 11.2)))), family history of

DM (AOR = 2.3, 95%CI (1.4, 3.9)), duration of DM since diagnosis (AOR = 0.3, 95% CI (0.1, 0.9)), and dietary adherence (AOR = 2.4, 95% CI (1.4, 4.1)) were associated factors to had good glycemic control. The study concluded that poor glycemic control was high. Educational status, family history of DM, duration of DM, and dietary adherence were the associated factors of glycemic control. The study recommended that appropriate attention shall be given for glycemic control especially for patients with a longer duration. Health promotion related to medical recommendations is a cross-cutting intervention for diabetic patients and should be provided for all type II diabetic patients.

A study by Alor et al., (2023) on Factors associated with glycaemic control among patients with type 2 diabetes mellitus in Ho, Ghana: A cross-sectional study. This was a hospital-based cross-sectional descriptive study of 326 patients with type 2 diabetes at the Ho Municipal and Teaching Hospitals. The adequate sample size was calculated using Yamane formula $N/1 + Ne^2$, with 95 % confidence interval, 5 % margin of error and 10 % non-response rate and a sample size of 326 was determined. Using the sampling frame of patients chart, systematic random sampling technique was used to select the study participants. Glycaemic level was assessed using fasting blood glucose (FBG) readings. A poor glycaemic control was when an average of three months blood glucose level was above 130 mg/dl (7 mm/L). Data was analysed using STATA version 15.0. The findings from the study revealed that Out of 310 patients who participated in the study, more than two-thirds (76.1 %) had poor glycaemic control. Patients who use combination of oral medication and insulin (AOR = 3.67, 95 % CI: 1.34–8.74), patients with diabetes for 16 years or more (AOR = 4.67, 95 % CI: 2.44–9.29), patients who did not practised diabetes self-care activities (AOR = 4.32, 95 % CI: 2.82–9.31) and patients with complications were (AOR = 2.47, 95%CI: 1.45–8.66) more likely to have poor glycaemic control. Age, employment, diabetes education, comorbidities, diabetes self-care activities, treatment type, complications, resident

and duration of diabetes were significantly associated with poor glycaemic control. Based on this findings, teaching and counselling provided by nurses, physicians, dietitians and pharmacists should focus on improving adherence to diabetes self-care activities to attain good glycaemic control.

A study by Lubaki et al., (2022) on Glycaemic control among type 2 diabetes patients in sub-Saharan Africa from 2012 to 2022: a systematic review and meta-analysis, five databases (African Index Medicus, Africa-Wide Information, Global Health, PubMed, and Web of Science) were searched using the following search terms: type-2 diabetes, glycaemic control, and sub-Saharan Africa. Only peer-reviewed articles from January 2012 to May 2022 were eligible for this review. Two reviewers, independently, selected articles, assessed their methodological quality using Joanna Briggs checklists, and extracted data. A meta-analysis was performed to estimate the prevalence of glycaemic control. Factors associated with glycaemic control were presented as a narrative synthesis due to heterogeneity as assessed by the I^2. The findings from the study revealed that a total of 74 studies, involving 21,133 participants were included in the review. The pooled prevalence of good glycaemic control was 30% (95% CI:27.6–32.9). The glycaemic control prevalence ranged from 10–60%. Younger and older age, gender, lower income, absence of health insurance, low level of education, place of residence, family history of diabetes, longer duration of diabetes, pill burden, treatment regimen, side effects, use of statins or antihypertensives, alcohol consumption, smoking, presence of comorbidities/complications, and poor management were associated with poor glycaemic control. On the other hand, positive perceived family support, adequate coping strategies, high diabetes health literacy, dietary adherence, exercise practice, attendance to follow-up, and medication adherence were associated with good glycaemic control. The study concluded that suboptimal glycaemic control is pervasive among patients with type-2 diabetes in sub-Saharan Africa and poses a significant public health challenge.

While urgent interventions are required to optimize glycaemic control in this region, these should consider sociodemographic, lifestyle, clinical, and treatment-related factors.

A study by Afroz et al., (2020) on Glycaemic Control for People with Type 2 Diabetes Mellitus in Bangladesh - An urgent need for optimization of management plan, a cross-sectional study was carried out and 1253 adult patients with type 2 diabetes mellitus were recruited from six hospitals. Data were collected from patients via face-to-face interview, and their medical records were reviewed. Multiple logistic regression analysis was performed. Among the participants, 53.2% were male. Mean (±SD) age was 54.1 (±12.1) years and mean (±SD) duration of diabetes was 9.9 (±7.2) years. The findings from the study revealed that about 82% participants had inadequate glycaemic control (HbA1c ≥ 7%) and 54.7% had very poor control (HbA1c ≥ 9%). Low education level, rural residence, unhealthy eating habits, insulin use, infrequent follow up check-ups and history of coronary artery diseases found associated with inadequate and very poor controls. Being female and smokeless tobacco consumer appeared to be associated with inadequate control however cognitive impairment was associated with very poor control only. The study concluded that prevalence of inadequate glycaemic level was very high in Bangladesh. Having understood relatable lifestyle modification factors, demographics and co-morbidities among people with type 2 diabetes, health care providers in conjunction with patients should work together to address the glycaemic control.

CHAPTER THREE

RESEARCH METHODOLODY

This chapter elaborates on the methods and procedures that was employed in this research. According to Jessen,(2012) methodology is the putting together of methods that assist one another and that have the capacity to fit and deliver data and findings that will reflect the research question and meet the needs of the researcher. This was discussed under the following headings: research design, research setting, population target, sample size, sampling technique, instrument, data collection, validity/Reliability of the instrument, method of data collection, method of data analysis and ethical consideration.

3.1 Research Design

The research design that was adopted in this study was descriptive cross-sectional survey and it involves the description of the summary of characteristics from a given population (to observe, describe and document) and to show the need for change. The descriptive survey allows one to describe things as they exist in their natural setting. This was considered suitable for the phenomenon that was studied as it allows the researcher examine the knowledge and measures utilized for prevention of nosocomial infection in a tertiary institution.

3.2 Research Setting

Research setting is the physical location and condition in which the data collection takes place in the study (Polit and Beck, 2009). This research setting can be seen as the physical, social, and cultural site in which the researcher conducts the study (Bhattacharya, 2008).

The study was carried out in the University of Benin Teaching Hospital (UBTH) Benin City, Edo State. University of Benin Teaching Hospital (UBTH) Benin City is located in Egor

Local Government Area of Edo State. It is a tertiary care facility that came into being in 1973 following the enactment of an edict (number 12). It is the sixth of the 1st generation teaching hospitals in Nigeria. It was established to compliment her sister institution, University of Benin and to provide secondary and tertiary care to then Midwestern region. At inception, its goal was encapsulated in her motto for teaching research and caring. Initially, it was commissioned as a 300 bedded hospital in 1973. UBTH has expanded her facility such that she now has facilities for over 900 inpatients and also several departments, but the nursing science department is used as a study area in this research. 720 nurses have been recorded recently.

3.3 Target Population

This refers to the entire group of individuals to which the researcher is interested in generalizing conclusion. 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 type 2 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 (July-September).

July	199 patients
August	223 patients
September	214 patients
Total	636 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.

3.4 Sample Size Determination

Census survey was used to recruit respondents that are available as at the time the questionnaire is administered.

(TARO YAMANE, 1967)

Where n=sample size

N=population size

D =level of precision (confidence interval)

N=636

D=0.05

n= N/1+N(d)2

n= 636/1+636(0.05)2

n=636/1+1.59

n=636/2.59

n=246

10% attrition rate= 10% sample size

= (10/100) x245.55

=25

Total sample size=246 +25=271

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 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 was chosen to ensure unity in diversity.

3.6 Instrument for Data Collection

The major instruments that was used for collection of primary data was a well-structured questionnaire designed and developed by the researcher with the help of the supervisor.

Copies of structured questionnaires was used as the research instruments by the researchers. Questions which was carefully drafted, sequenced and constructed in a bid to get in-depth information that is useful and relevant to the study, close ended questions was used. The questionnaire comprises of two sections:

Sections A consist of 4 socio-demographic variable items of which the respondents chooses one answer in the multiple choice question which is appropriate for them.

Section B consists of items on level of knowledge of diabetes mellitus with multiple choice question and one correct answer, level of Knowledge was scored and expressed in percentage using McDonald's standard of learning outcome measured criteria as thus: very Low<60%; Low = 60-69.99%; Moderate =70-79.99%; High= 80-89.99%; Very high= 90-100%

Section C consists of items on self care practices of diabetic patients. It was measured using a five point likert scale.

Section D consists of items on factors influencing self care practices of diabetic patients. It was measured using a five point likert scale.

Section E consists of items on glycemic control of diabetic patients.

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. 27 patients from Central Hospital, Benin- city was included in pre-testing the reliability of the instrument. Corrections was 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'. The Cronbach's value was reliable if the value is >0.7.

3.8 Validity of the Instrument

This is the indication of accuracy ensuring that findings truly represent the phenomenon being measured. This study used content validity to ascertain if the test is fully a representative of what it aims to measure. This helped to ensure appropriate data collections and necessary corrections was made before commencement of the study. The questionnaire that was used was carefully structured by the researcher and will follow a face and content validity, after thorough scrutiny by the supervisor, statistician and other experts in the field of nursing.

3.9 Method of Data Collection

Data was obtained by pre-determined questions that was given to respondents after a proper permission was sought from the Head of the Department which will introduce the researcher to them and a letter of permission by the Chief nursing Director. The purpose of the study was explained to them and the questionnaire was administered. Data was 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 was waited upon, after which respondents was taken to a section in the clinic, where questionnaire was administered. Those questions not understood was explained and illiterate respondents will given assistance.

3.10 Method of Data Analysis

Data was coded into International Business Machine (IBM) statistical software SPSS Version 24.0 windows. Descriptive and inferential statistics was used to analyse the data gathered. All questions was individually analysed, taking into considerations all factors and supported with descriptive analysis in the form of frequency, percentage, mean, standard deviation, bar chart, pie chart, tables. The inferential analysis was in form of Chi-square, analysis of variance (ANOVA logistic regression and multiple fractions. The statistical significance or P value <_0.05.

The decision for a 4 point Likert scale was a mean score of 2.50. as a mean greater than 2.50 is considered factors, Knowledge questions was scored as expressed in percentage as thus; 0-49.9% =Poor knowledge; 50-69%= Fair knowledge; 70-100%=Good knowledge.

3.11 Ethical Consideration

A proposal of the study and a letter of identification from the department was sent to the hospital research committee for ethical approval. The ethical consideration of the research

will include certain requirement for the researcher. The following ethical considerations was maintained during the research exercise:

Confidentiality: The information provided by the respondents was treated with utmost confidentiality. Respondents was made to understand that their responses to the questionnaire remained completely confidential and that observations was intended to be used only for scientific research purposes solely.

Voluntary Participation: The respondents had the right to voluntary decide whether to participate in the study or not without the risk of incurring any penalty or prejudice treatment. The right to withdraw their participation or refuse to provide any information that is not clear to them was given.

Anonymity: The researcher will ensure the anonymity of the respondents by not including any self-identification information. Hence, no name or address was requested for in the questionnaire.

Plagiarism: The researcher ensured that all used work, ideas and concepts was properly referenced

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 (years)	20-25	0	0.0
	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: Knowledge of Diabetes

(N=230)

	Frequency	Percentage	X	SD
What is your primary source of information?			2.64	0.99
Family/Friends	16	7.1		
Nurses	119	52.9		
Dieticians	26	11.6		
Internet	64	28.4		
Books/Magazine	0	0		
Diabetes is ……..			1.25	0.46
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			2.63	1.49
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			1.61	1.31
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			2.93	0.71
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			2.39	1.74
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 table above shows respondents 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

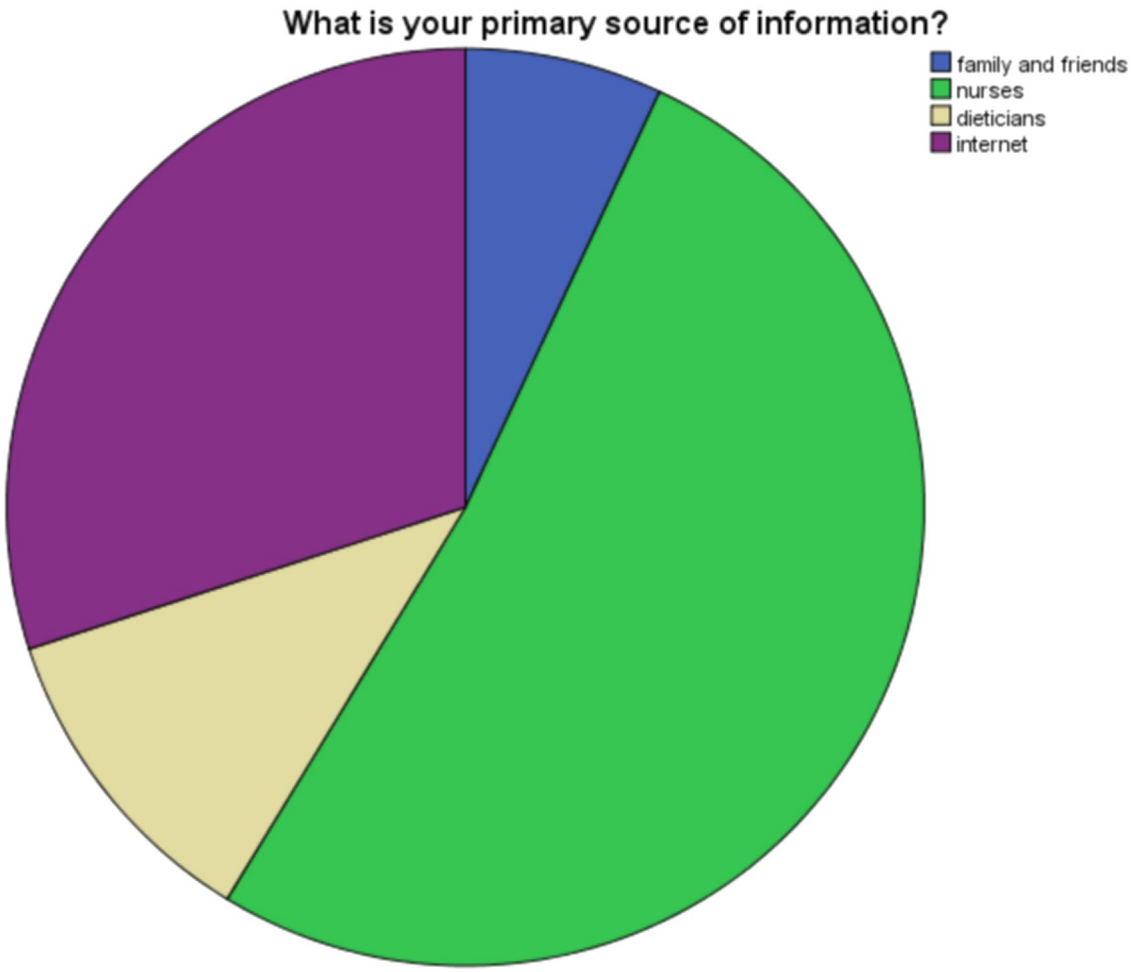

Figure 4.1: Sources of Information about nutritional knowledge of diabetes

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

Table 4.4: Self-Care Practices

		SD	D	A	SA	$\bar{x}$	SD	Remark
1	I follow a healthy meal pan	66(28.7)	80(34.8)	46(20.0)	38(16.5)	2.24	1.05	Poor
2	I limit sugary foods and drinks	88(38.3)	83(36.1)	28(12.2)	31(13.5)	I.96	1.00	Poor
3	I engage in regular physical activity eg walking	48(20.9)	94(40.9)	70(30.4)	18(7.8)	2.16	0.79	Poor
4	I engage in relaxing activities eg reading	27(11.7)	33(14.3)	124(53.9)	46(20.0)	2.82	0.89	Good
5	I seek support from family and friends	51(22.2)	88(38.3)	66(28.7)	25(10.9)	2.28	0.93	Poor
6	I take diabetes medication as prescribed	45(19.6)	65(28.3)	84(36.5)	36(15.7)	2.48	0.97	Poor
	Overall					**2.35**		**Poor**

Good Self-Care Practices = Mean score >2.50

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

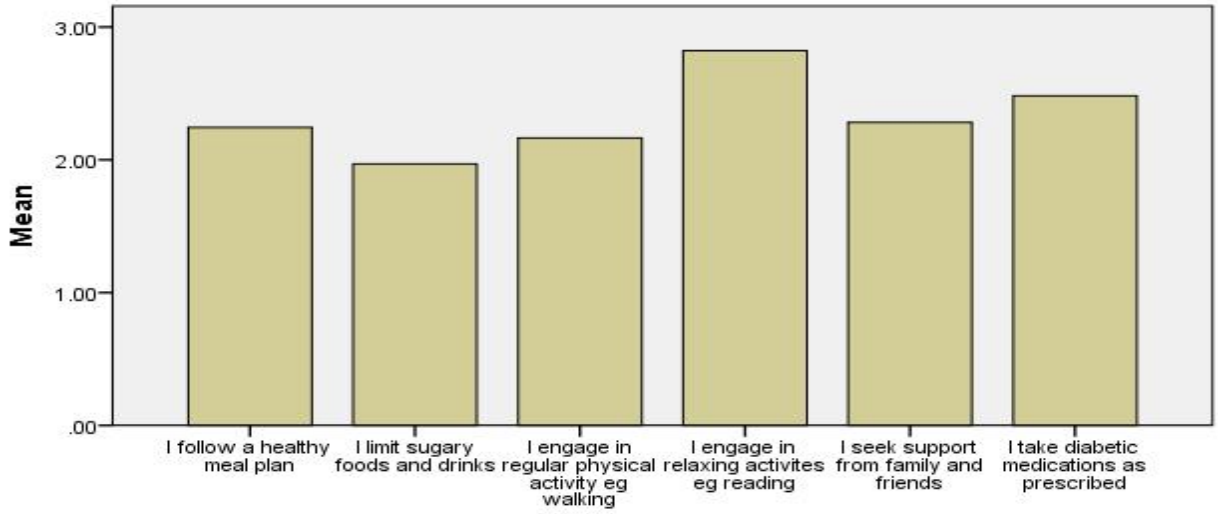

Figure 2: Bar Chart showing the mean values of self-care practices of respondents

Table 4.5: Factors Influencing Self-Care Practices

	A	SA	D	SD	X	SD	Remarks
I do not have access to healthy food option	75(32.6)	103(44.8)	38(16.5)	14(6.1)	2.96	0.86	Factor
Family/friends do not support my self-care effort	39(17.0)	119(51.7)	63(27.4)	9(3.9)	2.68	0.75	Factor
I feel motivated to manage my diabetes	18(7.9)	55(24.2)	97(42.7)	57(25.1)	2.62	0.89	Factor
I participate in diabetes support groups	43(18.8)	53(23.1)	79(34.5)	54(23.6)	2.56	1.04	Factor
My living environment supports physical activity	43(18.7)	110(47.8)	47(20.4)	30(13.0)	2.58	0.92	Factor
Healthcare facilities are conveniently located	91(39.6)	84(36.5)	34(14.8)	21(9.1)	2.52	0.95	Factor

Cut off score = 2.50

The table above showed factors influencing self-care practices among respondents. For all the items measured, it showed that as all the items are factors influencing self-care practices as their mean scores were above 2.50.

Table 4.6: Glycemic Control of Respondents

	(N=230)	
	Frequency	**Percentage**
Glycosylated Haemoglobin		
<6.5	24	10.4
>6.5	206	89.6
Fasting Blood Sugar		
>130mg/dl	211	91.7
<130mg/dl	19	8.3
Postprandial Glucose		
>180mg/dl	213	92.6
<180mg/dl	17	7.4

Table 4.6 above shows the glycemic control of respondents. On the glycosylated haemoglobin, majority 206(89.6%) of the respondents have >6.5 while 24(10.4%) have <6.5. On the fasting blood glucose level, 211(91.7%) have >130mg/dl while 19(8.3%) have <130mg/dl. On the postprandial glucose level, 213(92.6%) have >180mg/dl while 17(7.4%) have <180mg/dl.

Table 4.7: Glycemic control

	Frequency	Percentage
Poor	200	87
Good	30	13

Table 4.7 shows the glycemic control of diabetes. Two hundred 200 (87%) of the respondents have poor glycemic control while 30(17%) have good glycemic control.

HYPOTHESIS TESTING

Hypothesis One: There is no significant association between the knowledge of diabetes and the socio-demographic characteristics of the respondents

Table 4.8: Multivariate logistic regression of association between knowledge of diabetes and the socio-demographic characteristics of the respondents

	P	OR	95% Cl for Or
Sex			
Male		1.00	
Female	0.749	1.86	0.343-2.159
Age			
21 – 30	0.476	0.553	0.108-2.822
31 – 40	0.191	0.423	0.117-1.535
41 – 50	0.237	2.466	0.132-1.651
>50		1.00	
Marital status			
Single	0.004	2.89	2.702-49.673
Married	0.034	5.34	1.135 -25.135
Divorced	0.518	0.513	0.068-3.879
Others		1.00	

OR: Odds ratio. CI: Confidence interval.

Table 4.8 shows the multivariate logistic regression associating with socio-demographic characteristics and level of knowledge. The result shows that females are two times (odds ratio [OR] = 1.86, confidence interval [CI] = 0.343-2.159) more likely to have good Knowledge than males. Respondents between 41-50 years are twice more likely to have good than the others. Respondents that are married are five times more likely to have good knowledge than those single. Gender, age and marital status show a significance difference ($p<0.05$).

Hypothesis Two: There is no association between the level of glycemic control knowledge of and the socio-demographic characteristics of the respondents

Table 4.7: Multivariate logistic regression of association between the level of glycemic control and the socio-demographic characteristics of the respondents

	P	OR	95% Cl for Or
Sex			
Male		1.00	
Female	0.749	4.94	3.330-46.882
Age			
21 – 30	0.001	0.06	0.000-0.114
31 – 40	0.000	1.03	2.664-49.673
41 – 50	0.000	1.31	0.344-4.209
>50		1.00	
Marital status			
Single	0.854	1.31	0.304-4.209
Married	0.376	7.89	0.494 -6.484
Divorced	0.326	0.513	0.068-3.879
Widowed		1.00	

OR: Odds ratio. CI: Confidence interval.

Table 4.8 shows the multivariate logistic regression associating with socio-demographic characteristics and glycemic control. The result shows that females are four times (odds ratio [OR] = 4.96, confidence interval [CI] = 3.330-46.882) more likely to have good glycemic control than males. Respondents between 41-50 years are twice more likely to have good glycemic control than the others. Respondents that are married are seven times more likely to have good knowledge than those single. Gender, age and marital status show a significance difference ($p<0.05$).

Hypothesis Three: There is no significant association between self-care practices and glycemic control of the respondents

Table 4.7: Relationship between self-care practices and glycemic control

	Self-Care		DF	p
	Poor	Good		
Glycemic control				
Poor (0-49.9)	150(74.2)	17(25.8)	2.368	0.000
Good (70-100)	50(83.3)	13(16.7)		

The table shows that there is a significant relationship ($p<0.05$) between self-care practices and glycemic control. Since the calculated p value is lesser than the tabulated p value, the null hypothesis is rejected.

Hypothesis Four: There is no significant difference between the knowledge and self-care practices of patients with diabetes attending a tertiary institution, Benin City.

Table 4.7: Relationship between level of knowledge and self-care practices

	Poor	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 self-care practices. 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 knowledge and self-care practices among type-2 diabetes mellitus patients in selected hospitals, Benin City, Edo state. In the course of carrying out this study, four 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, knowledge of diabetes, self-care practices of respondents, factors influencing self-care practices and glycemic control of respondents were assessed using a structured questionnaire that was designed by the researcher.

5.1.1 Knowledge of Diabetes

The findings from this study, shows that the respondents have fair knowledge of diabetes. This is in contrast with Kumar et al., (2023) who found out that majority of the respondents had low knowledge on diabetes which is in contrast with Mahzari et al., (2022) who reported that the respondents have insufficient knowledge on diabetes. This is also in line with Zemene et al., (2022) which reported that majority of the respondents have fair knowledge of Also, a greater percentage of the respondents had knowledge of diabetes from nurses, closely followed by internet, followed by dieticians, and then family and friends This is in contrast with Mahzari *et al.* (2023) which showed that majority of the respondents got their knowledge from mass media, family and friends.

5.1.2 Self-Care Practices

With reference to the findings of this study, the self-care practices of the respondents were poor. This is supported by Zewdie et al., (2022) which revealed poor self-care practices of the respondents. This is equally in line with Bayable et al., (2022) which reported poor self-care practices. This is supported by Bekele et al., (2024) which also reported poor self-care practices of the respondents.

5.1.3 Factors Influencing Self-Care Practices

The findings of this study showed that access to healthy food option, lack of family/friend support, motivation, participation in diabetes support groups, access to healthcare facilities etc. This is in contrast with Joshi et al., (2022) which reported adherence to medication and blood glucose monitoring are factors influencing self-care practices. This is also in contrast with Okafor et al., (2024) which reported age, gender, marital status, educational level are factors influencing self-care practices.

5.1.4 Glycaemic Control

The findings from this study revealed that majority of the respondents have poor glycemic control. This is in line Bin et al., (2022) which reported that respondents have poor glycemic control. This is also in contrast with Dinavari et al., (2023) which reported that respondents have poor glycemic control.

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 these 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 self-care practices and encourage them to make dietary goals that are achievable. This will help to promote positive health behaviours.

Nursing Education: This is what is hoped to be achieved at the end of the day. With good 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 researchability interest, by conducting more research to broaden their 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

This study on the knowledge and self-care practices among type-2 diabetes mellitus patients in selected hospitals, 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 knowledge of diabetes, self-care practices, factors influencing self-care practices, glycemic control, social demographic and measures to improve the knowledge of diabetes. The literature reviewed various works that have previously been carried out in various places concerning knowledge of diabetes, self-care practices, factors influencing self-care practices and glycemic control. It showed that the 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 knowledge of diabetes, have poor self-care practices, poor glycemic control, access to healthy food option, lack of family/friend support, motivation, participation in diabetes support groups, access to healthcare facilities are factors influencing self-care practices. 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' knowledge which entails their self-care practices 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 knowledge of diabetes but have poor self-care practices, poor glycemic control and access to healthy food option, lack of family/friend support, motivation, participation in diabetes support groups, access to healthcare facilities are factors influencing self-care practices..

5.6 Recommendation

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 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.

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