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“Type 2 diabetes: a 21st century epidemic" (population-based cross-sectional survey)

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Independent University, Bangladesh (IUB)

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“Type 2 Diabetes: A 21st Century Epidemic"

(Population-based cross-sectional survey)

A project report submitted to the Department of Pharmacy, Independent University, Bangladesh, in partial fulfillment of the requirements for the degree of

Bachelor of Pharmacy

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Dedicated to…

We dedicate this work to all individuals living with diabetes, whose fortitude, resilience, and determination in the face of adversity continue to inspire efforts to improve healthcare outcomes, strengthen public health initiatives, and cultivate healthier, more informed communities.

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DECLARATION BY THE STUDENT

I hereby declare that this research project, entitled **"Type 2 Diabetes: A 21st Century Epidemic", based on a population-based cross-sectional survey,** is the result of my original work carried out under the supervision of Ms. Naima Nusrat Jahan, Lecturer, Department of Pharmacy, Independent University, Bangladesh. The data presented in this study were collected using a structured questionnaire and analyzed by me in accordance with accepted academic and ethical research standards. All information, concepts, and findings obtained from published literature have been duly acknowledged and appropriately cited in the reference section.

I further declare that this thesis has not been submitted, either in whole or in part, to any other university or institution for the award of any degree, diploma, or other academic qualification.

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Certification by the Supervisor

I hereby certify that the research project entitled **"Type 2 Diabetes: A 21st Century Epidemic"** has been completed by **Sumaiya Sultana Nodi** under my supervision. The study was undertaken in accordance with the program's academic requirements, and the candidate successfully conducted **a population-based cross-sectional survey** and completed all stages of the research under my guidance.

To the best of my knowledge and belief, the work presented in this thesis is the result of the candidate's own independent research and has been carried out with due diligence, intellectual integrity, and adherence to accepted ethical and scholarly standards. The processes of data collection, statistical analysis, interpretation of findings, and preparation of the final manuscript were conducted under my supervision and have been carefully examined.

I am satisfied that this dissertation represents a genuine and original contribution by the candidate and that it fulfills the academic standards required for submission in partial fulfillment of the degree requirements.

Naima Nusrat Jahan

Lecturer

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Ethical Statement

This research, entitled “Type 2 Diabetes: A 21st Century Epidemic: A Population-Based Cross-Sectional Survey,” was conducted in accordance with established ethical guidelines for research involving human participants. Participation was entirely voluntary, and informed consent was obtained from all participants after they had been adequately informed about the purpose and procedures of the study.

Participants were assured of complete anonymity and confidentiality, and no personally identifiable information was collected. The data were used exclusively for academic and research purposes. Participants were informed of their right to refuse or withdraw from the study at any stage without any consequences. These ethical measures were implemented to protect participants' rights, ensure the confidentiality of the information provided, and uphold the integrity and credibility of the research.

Acknowledgement

I would like to express my sincere gratitude to all those who contributed to the successful completion of this research project entitled “Type 2 Diabetes: A 21st Century Epidemic: A Population-Based Cross-Sectional Survey.”

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Abstract

Background: Type 2 diabetes mellitus (T2DM) is one of the most prevalent non-communicable diseases worldwide and represents a major public health challenge of the 21st century. Its increasing incidence is closely associated with urbanization, sedentary lifestyles, unhealthy dietary habits, obesity, and population aging. Despite advances in prevention and treatment, inadequate awareness and poor lifestyle practices continue to contribute to the growing burden of the disease. This study aimed to assess the level of awareness, risk factors, preventive practices, and public perceptions regarding Type 2 diabetes among the general population.

Methods: A population-based cross-sectional survey was conducted among adult participants using a structured, self-administered questionnaire. The questionnaire collected information on participants' socio-demographic characteristics, knowledge of Type 2 diabetes, associated risk factors, symptoms, preventive practices, and attitudes toward diabetes awareness. Data were collected following informed consent and analyzed using descriptive statistical methods to summarize participants' responses.

Results: The majority of respondents (91.1%) were aged between 18 and 30 years, while 43.5% were female. Awareness of Type 2 diabetes was reported by most participants; however, knowledge regarding risk factors, symptoms, and preventive strategies varied considerably. Many respondents recognized unhealthy dietary habits, physical inactivity, obesity, and a family history of diabetes as important risk factors. Lifestyle modification, including regular physical activity and healthy eating, was widely acknowledged as an effective preventive approach, although the adoption of these practices remained limited. Most participants expressed support for community-based diabetes awareness campaigns and indicated a willingness to participate in educational programs aimed at promoting diabetes prevention and healthy lifestyle behaviors.

Conclusion: The findings indicate that although awareness of Type 2 diabetes is relatively high among young adults, important gaps remain in translating knowledge into preventive practices. Strengthening public health education, promoting healthy lifestyle behaviors, and expanding access to community-based awareness programs are essential to reducing the growing burden of Type 2 diabetes and improving long-term health outcomes.

1. Introduction

Diabetes mellitus (DM) represents a group of heterogeneous metabolic disorders characterized by chronic hyperglycemia due to abnormalities in insulin secretion, insulin action, or both (Harreiter & Roden, 2019). The condition has been recognized since ancient times, with early descriptions noting excessive urination and sweet-tasting urine. Over time, advancements in medical science have led to a better understanding of its pathophysiology, classification, and management.

In the 21st century, diabetes has emerged as a global epidemic, particularly affecting low- and middle-income countries. Rapid urbanization, lifestyle changes, and increased life expectancy have contributed significantly to its rising prevalence (Ruze et al., 2023). According to recent estimates, hundreds of millions of individuals worldwide are living with diabetes, and this number is projected to increase substantially in the coming decades.

Diabetes is associated with significant morbidity and mortality due to its long-term complications, which include cardiovascular disease, kidney failure, neuropathy, retinopathy, and cognitive decline (American Diabetes Association Professional Practice Committee, 2022). These complications not only reduce quality of life but also place a substantial economic burden on healthcare systems.

The importance of early diagnosis and intervention cannot be overstated. Screening for high-risk populations and identifying individuals with prediabetes are crucial steps in preventing disease progression and reducing complications (Harreiter & Roden, 2019). Despite advancements in treatment and management, many individuals remain undiagnosed, particularly in developing regions.

This literature review aims to provide a comprehensive and critical overview of diabetes mellitus, focusing on its classification, diagnostic criteria, and epidemiological trends. By synthesizing current research, this review seeks to highlight key findings, identify knowledge gaps, and provide a foundation for future research and clinical practice.

1.1 Classification and Diagnosis of Diabetes Mellitus

1.1.1 Classification of Diabetes

Diabetes mellitus is broadly classified into several categories based on its etiology and pathophysiology. The major types include type 1 diabetes mellitus (T1DM), type 2 diabetes mellitus (T2DM), gestational diabetes mellitus (GDM), and other specific types such as monogenic diabetes (Deutsch et al., 2022).

Type 1 Diabetes Mellitus

Type 1 diabetes is an autoimmune disorder characterized by the destruction of pancreatic β-cells, leading to absolute insulin deficiency. It typically presents in childhood or adolescence, although adult-onset cases are increasingly recognized

(Subramanian et al., 2024). The disease is strongly associated with genetic susceptibility and environmental triggers.

Type 2 Diabetes Mellitus

Type 2 diabetes accounts for approximately 90–95% of all diabetes cases and is characterized by insulin resistance and relative insulin deficiency (Deutsch et al., 2022). It is strongly associated with obesity, sedentary lifestyle, and genetic predisposition. Unlike type 1 diabetes, it develops gradually and may remain undiagnosed for years.

Gestational Diabetes Mellitus

Gestational diabetes is defined as glucose intolerance that develops during pregnancy. It increases the risk of complications for both the mother and the fetus and is associated with a higher likelihood of developing type 2 diabetes later in life.

Other Specific Types

Other forms of diabetes include monogenic diabetes such as maturity-onset diabetes of the young (MODY) and latent autoimmune diabetes in adults (LADA). These forms have distinct genetic or immunological causes and require specific diagnostic approaches.

1.1.2 Diagnosis of Diabetes

The diagnosis of diabetes mellitus is based on established biochemical criteria. The American Diabetes Association (ADA) provides widely accepted guidelines for diagnosis.

Diagnostic Criteria

Diabetes can be diagnosed using one of the following criteria:

- Fasting plasma glucose (FPG) ≥ 7.0 mmol/L (126 mg/dL)
- Random plasma glucose ≥ 11.1 mmol/L (200 mg/dL) with symptoms
- 2-hour plasma glucose ≥ 11.1 mmol/L during oral glucose tolerance test (OGTT)
- Glycated hemoglobin (HbA1c) ≥ 6.5%

These criteria have been developed to ensure early detection and accurate diagnosis (Harreiter & Roden, 2019).

Prediabetes

Prediabetes is an intermediate state of hyperglycemia where blood glucose levels are higher than normal but not high enough to be classified as diabetes. Identifying individuals with prediabetes is important for preventing progression to type 2 diabetes.

Role of Biomarkers

Biomarkers such as HbA1c and autoantibodies play a crucial role in diagnosis and classification. For example, the presence of islet autoantibodies is indicative of type 1 diabetes, whereas no specific biomarker definitively diagnoses type 2 diabetes (Deutsch et al., 2022).

1.2 Epidemiology of Diabetes Mellitus

Global Prevalence

Diabetes mellitus is one of the fastest-growing chronic diseases worldwide. According to recent estimates, approximately 537 million adults were living with diabetes in 2021, and this number is expected to rise to 783 million by 2045 (Ruze et al., 2023). This rapid increase highlights the growing public health burden of the disease.

Regional Distribution

The prevalence of diabetes varies significantly across regions. High-income countries have historically reported higher prevalence rates; however, the most rapid increases are now observed in low- and middle-income countries. This trend is largely attributed to urbanization, dietary changes, and reduced physical activity.

Undiagnosed Diabetes

A significant proportion of individuals with diabetes remain undiagnosed. It is estimated that nearly half of all diabetes cases worldwide are undiagnosed, particularly in developing regions (Ruze et al., 2023). This delays treatment and increases the risk of complications.

Risk Factors

Major risk factors for diabetes include:

- Obesity
- Sedentary lifestyle
- Unhealthy diet
- Genetic predisposition
- Aging

Obesity is considered one of the strongest risk factors for type 2 diabetes due to its role in promoting insulin resistance.

Trends in Type 1 and Type 2 Diabetes

The incidence of type 1 diabetes is increasing globally, particularly among children and adolescents. Meanwhile, type 2 diabetes continues to rise across all age groups, including younger populations, due to increasing rates of obesity and lifestyle changes (Subramanian et al., 2024).

1.3 Pathophysiology of Diabetes Mellitus

Understanding the pathophysiology of diabetes mellitus is essential for identifying therapeutic targets and improving disease management. The mechanisms differ significantly between type 1 diabetes mellitus (T1DM) and type 2 diabetes mellitus (T2DM), although both ultimately result in chronic hyperglycemia.

Pathophysiology of Type 1 Diabetes Mellitus

Type 1 diabetes is primarily an autoimmune disorder characterized by the destruction of insulin-producing pancreatic β-cells. This process leads to absolute insulin deficiency and dependence on exogenous insulin therapy.

Autoimmune Mechanisms

The development of T1DM involves an autoimmune response in which the body's immune system mistakenly targets β-cells in the pancreas. This process is mediated by T lymphocytes, particularly CD4+ and CD8+ T cells, which infiltrate the islets of Langerhans and cause progressive β-cell destruction (Atkinson et al., 2021).

Autoantibodies against β-cell antigens, such as insulin, glutamic acid decarboxylase (GAD), and islet antigen-2 (IA-2), are commonly detected in individuals with T1DM. These autoantibodies serve as important biomarkers for early diagnosis and disease prediction.

Genetic Susceptibility

Genetic factors play a significant role in the development of T1DM. The strongest associations are found within the human leukocyte antigen (HLA) region, particularly HLA-DR and HLA-DQ alleles (Atkinson et al., 2021). Individuals carrying these genetic markers are at increased risk of developing autoimmune responses against β-cells.

However, genetic predisposition alone is insufficient to cause the disease, indicating the involvement of environmental triggers.

Environmental Triggers

Environmental factors such as viral infections, dietary components, and early-life exposures may contribute to the onset of T1DM. Viral infections, including

enteroviruses, have been proposed to initiate or accelerate autoimmune destruction through molecular mimicry and immune activation.

Metabolic Consequences

The loss of insulin production leads to impaired glucose uptake by peripheral tissues, resulting in hyperglycemia. Additionally, the body begins to break down fats for energy, producing ketone bodies, which can lead to diabetic ketoacidosis (DKA), a life-threatening complication.

Pathophysiology of Type 2 Diabetes Mellitus

Type 2 diabetes is a multifactorial disease characterized by insulin resistance and progressive β-cell dysfunction. Unlike T1DM, insulin is present but ineffective in maintaining normal glucose levels.

Insulin Resistance

Insulin resistance is a condition in which target tissues such as muscle, liver, and adipose tissue fail to respond adequately to insulin. This results in decreased glucose uptake and increased hepatic glucose production (DeFronzo et al., 2019).

At the molecular level, insulin resistance is associated with defects in insulin signaling pathways, including impaired activity of insulin receptor substrates (IRS) and reduced translocation of glucose transporter type 4 (GLUT4).

β-Cell Dysfunction

In response to insulin resistance, pancreatic β-cells initially increase insulin secretion to maintain normal glucose levels. However, over time, β-cells become dysfunctional due to chronic metabolic stress, leading to inadequate insulin production (DeFronzo et al., 2019).

Role of Adipose Tissue

Adipose tissue plays a crucial role in the development of insulin resistance. In obesity, adipocytes release increased levels of free fatty acids and pro-inflammatory cytokines such as tumor necrosis factor-alpha (TNF-α) and interleukin-6 (IL-6), which impair insulin signaling (Ruze et al., 2023).

Inflammation and Oxidative Stress

Chronic low-grade inflammation is a hallmark of T2DM. Inflammatory pathways contribute to insulin resistance and β-cell damage. Oxidative stress, caused by an imbalance between reactive oxygen species and antioxidant defenses, further exacerbates cellular dysfunction.

1.4 Complications of Diabetes Mellitus

Chronic hyperglycemia leads to a wide range of complications that significantly impact morbidity and mortality. These complications are broadly categorized into microvascular and macrovascular complications.

Microvascular Complications

Diabetic Retinopathy

Diabetic retinopathy is a leading cause of blindness worldwide. It results from damage to retinal blood vessels, leading to microaneurysms, hemorrhages, and neovascularization (American Diabetes Association Professional Practice Committee, 2022).

Diabetic Nephropathy

Diabetic nephropathy is characterized by progressive kidney damage, leading to proteinuria and eventual renal failure. It is one of the leading causes of end-stage renal disease globally.

Diabetic Neuropathy

Diabetic neuropathy involves damage to peripheral nerves, resulting in symptoms such as pain, tingling, and loss of sensation. It significantly increases the risk of foot ulcers and amputations.

Macrovascular Complications

Macrovascular complications involve large blood vessels and include cardiovascular diseases such as coronary artery disease, stroke, and peripheral artery disease. Individuals with diabetes have a significantly higher risk of cardiovascular morbidity and mortality (DeFronzo et al., 2019).

Cognitive Impairment and Dementia

Emerging evidence suggests a strong association between diabetes and cognitive decline. Chronic hyperglycemia and insulin resistance may contribute to neurodegeneration and increase the risk of conditions such as Alzheimer’s disease (Ruze et al., 2023).

Diabetes and Cancer

Recent studies have identified a link between diabetes and an increased risk of certain cancers, including liver, pancreatic, and colorectal cancers. Hyperinsulinemia, inflammation, and altered metabolic pathways are believed to contribute to tumor development.

Obesity and Diabetes: A Strong Association

Obesity is one of the most significant risk factors for type 2 diabetes. The relationship between obesity and diabetes is complex and involves metabolic, hormonal, and inflammatory mechanisms.

Role of Adipose Tissue

Adipose tissue is not merely a storage site for fat but also an active endocrine organ. It secretes hormones and cytokines that influence metabolism and insulin sensitivity.

Free Fatty Acids and Insulin Resistance

Elevated levels of free fatty acids in obesity impair insulin signaling pathways, leading to reduced glucose uptake and increased insulin resistance (DeFronzo et al., 2019).

Inflammatory Pathways

Obesity is associated with chronic low-grade inflammation. Adipose tissue releases pro-inflammatory cytokines that interfere with insulin signaling and contribute to metabolic dysfunction.

Metabolic and Microenvironmental Changes

Changes in the metabolic microenvironment, including altered amino acid metabolism and lipid accumulation, further exacerbate insulin resistance and β-cell dysfunction.

1.5 Risk Factors and Prevention of Diabetes

Modifiable Risk Factors

- Obesity
- Physical inactivity
- Unhealthy diet
- Smoking

Non-Modifiable Risk Factors

- Age

- Genetic predisposition
- Family history

Prevention Strategies

Preventive strategies focus on lifestyle modifications, including:

- Healthy diet
- Regular physical activity
- Weight management

Early intervention in individuals with prediabetes can significantly reduce the risk of developing type 2 diabetes.

1.6 Treatment Guidelines for Type 2 Diabetes Mellitus

The management of Type 2 Diabetes Mellitus (T2DM) aims to achieve and maintain optimal glycemic control, prevent acute and chronic complications, improve quality of life, and reduce diabetes-related morbidity and mortality. Current treatment guidelines emphasize a patient-centered approach that integrates lifestyle modification, pharmacological therapy, cardiovascular risk management, and regular monitoring (American Diabetes Association Professional Practice Committee, 2025).

Treatment Goals

The primary goals of T2DM management include:

- Maintaining glycated hemoglobin (HbA1c) below 7% for most adults.
- Achieving fasting plasma glucose levels between 80–130 mg/dL.
- Maintaining postprandial glucose levels below 180 mg/dL.
- Preventing microvascular and macrovascular complications.
- Managing associated comorbidities such as hypertension, obesity, and dyslipidemia (Davies et al., 2022).

Treatment goals should be individualized based on age, duration of diabetes, life expectancy, risk of hypoglycemia, comorbid conditions, and patient preferences.

Lifestyle Modification

Lifestyle intervention is the foundation of T2DM management and should be initiated at diagnosis.

Medical Nutrition Therapy

A healthy dietary pattern is recommended to improve glycemic control and cardiovascular health. Key recommendations include:

- Increased consumption of vegetables, fruits, whole grains, and legumes.
- Limiting refined carbohydrates and sugar-sweetened beverages.
- Reducing saturated and trans-fat intake.
- Encouraging portion control and calorie restriction for overweight individuals (Evert et al., 2024).

Weight reduction of 5–10% can significantly improve insulin sensitivity and glycemic control.

Physical Activity

Regular exercise improves insulin sensitivity and glucose utilization.

Recommended physical activity includes:

- At least 150 minutes of moderate-intensity aerobic exercise per week.
- Resistance training at least two to three times weekly.
- Minimizing prolonged sedentary behavior (American Diabetes Association Professional Practice Committee, 2025).

Weight Management

Weight loss is strongly associated with improved glycemic control and reduced cardiovascular risk. In some patients, substantial weight reduction can lead to partial or complete remission of T2DM (Lean et al., 2019).

Pharmacological Management

Pharmacological treatment should be initiated when lifestyle interventions alone are insufficient to achieve glycemic targets.

Metformin: First-Line Therapy

Metformin remains the preferred initial pharmacological treatment for most patients with T2DM due to its effectiveness, safety profile, low cost, and minimal risk of hypoglycemia (Davies et al., 2022).

Mechanisms of action include:

- Reduction of hepatic glucose production.
- Improvement of insulin sensitivity.

- Enhancement of peripheral glucose uptake.

Common adverse effects include gastrointestinal disturbances and vitamin B12 deficiency with long-term use.

Sodium-Glucose Cotransporter-2 (SGLT2) Inhibitors

Examples include:

- Empagliflozin
- Dapagliflozin
- Canagliflozin

These agents lower blood glucose by increasing urinary glucose excretion.

Benefits include:

- Reduction in cardiovascular events.
- Protection against chronic kidney disease progression.
- Weight reduction.
- Lower blood pressure (American Diabetes Association Professional Practice Committee, 2025).

SGLT2 inhibitors are particularly recommended for patients with heart failure, atherosclerotic cardiovascular disease, or chronic kidney disease.

Glucagon-Like Peptide-1 Receptor Agonists (GLP-1 RAs)

Examples include:

- Semaglutide
- Liraglutide
- Dulaglutide

GLP-1 receptor agonists:

- Stimulate glucose-dependent insulin secretion.
- Suppress glucagon release.
- Delay gastric emptying.
- Promote satiety and weight loss (Davies et al., 2022).

Several GLP-1 receptor agonists have demonstrated cardiovascular benefits and are recommended for patients with established cardiovascular disease.

Dipeptidyl Peptidase-4 (DPP-4) Inhibitors

Examples include:

- Sitagliptin
- Linagliptin
- Saxagliptin

These drugs increase endogenous incretin activity, improving insulin secretion and reducing glucagon production.

Advantages include:

- Low risk of hypoglycemia.
- Weight neutrality.

However, their glucose-lowering efficacy is generally less than that of GLP-1 receptor agonists.

Sulfonylureas

Examples include:

- Glimepiride
- Gliclazide
- Glibenclamide

Sulfonylureas stimulate pancreatic insulin secretion and are effective in lowering blood glucose levels. However, they are associated with:

- Weight gain.
- Increased risk of hypoglycemia.

Consequently, their use has declined in favor of newer agents.

Thiazolidinediones (TZDs)

Pioglitazone is the most commonly used TZD.

Benefits include:

- Improved insulin sensitivity.
- Durable glycemic control.

Potential adverse effects include:

- Weight gain.
- Fluid retention.
- Increased risk of heart failure in susceptible individuals.

Insulin Therapy

Insulin therapy should be considered when:

- HbA1c remains markedly elevated despite oral therapy.
- Severe hyperglycemia is present.
- Symptoms of catabolism occur (weight loss, ketosis).
- During pregnancy or severe illness (American Diabetes Association Professional Practice Committee, 2025).

Basal insulin is usually initiated first and may later be intensified with prandial insulin if necessary.

Management of Cardiovascular Risk Factors

Since cardiovascular disease is the leading cause of death among individuals with T2DM, comprehensive risk reduction is essential.

Blood Pressure Control

- Target generally <130/80 mmHg for many patients.
- ACE inhibitors or angiotensin receptor blockers are commonly recommended.

Lipid Management

- Statin therapy is recommended for most adults with diabetes.
- LDL cholesterol targets depend on cardiovascular risk status.

Antiplatelet Therapy

- Aspirin may be considered for secondary prevention in patients with established cardiovascular disease (American Diabetes Association Professional Practice Committee, 2025).

Monitoring and Follow-Up

Regular monitoring is essential for effective diabetes management.

Recommended assessments include:

- HbA1c every 3–6 months.
- Blood pressure at each visit.
- Annual eye examinations.
- Annual renal function assessment.
- Foot examinations for neuropathy and ulcer prevention.
- Lipid profile monitoring (Davies et al., 2022).

Emerging Therapies and Future Directions

Recent advances in diabetes management focus on therapies that address both glycemic control and cardiovascular protection. Novel agents such as dual glucose-dependent insulinotropic polypeptide (GIP) and GLP-1 receptor agonists, including tirzepatide, have shown substantial benefits in glucose lowering and weight reduction (Jastreboff et al., 2022).

Future treatment strategies may increasingly emphasize precision medicine, individualized therapy, and disease remission through intensive lifestyle interventions and metabolic surgery.

Diabetes mellitus is a chronic and increasingly prevalent metabolic disorder that poses a significant global health challenge. This literature review highlights the complex nature of the disease, encompassing diverse etiologies, pathophysiological mechanisms, and clinical manifestations.

Type 1 diabetes is characterized by autoimmune destruction of pancreatic β-cells, while type 2 diabetes involves insulin resistance and progressive β-cell dysfunction. Both forms result in chronic hyperglycemia, which leads to a wide range of complications affecting multiple organ systems.The global burden of diabetes continues to rise, driven by factors such as urbanization, lifestyle changes, and increasing rates of obesity. This trend is particularly concerning in low- and middle-income countries, where healthcare resources may be limited.Early diagnosis and effective management are critical for reducing the risk of complications. Advances in diagnostic criteria and biomarkers have improved disease detection; however, many cases remain undiagnosed. Preventive strategies focusing on lifestyle modification, including healthy diet and physical activity, play a crucial role in reducing the incidence of type 2 diabetes.

In conclusion, diabetes mellitus requires a comprehensive and multidisciplinary approach that includes prevention, early detection, and effective management.

Continued research is essential to address existing knowledge gaps and to develop innovative strategies for combating this global health crisis.

2. Methods and Materials

SI no	Material	Description	Use
01.	**Questionnaire**	A structured survey with 24 questions on Diabetes awareness & risk assessment, including demographics, knowledge, and attitudes.	Used to collect primary data from participants regarding their understanding and perceptions of Diabetes awareness & risk assessment.
02.	**MS Excel**	Microsoft Excel software for data management and analysis.	Organized, stored, and analyzed questionnaire responses, including calculating frequencies and percentages**.**

Data Analysis

Data were entered into Microsoft Excel for cleaning and analysis. Descriptive statistics, including frequencies and percentages, were used to summarize demographic characteristics and levels of awareness.This study employed a cross-sectional survey design to evaluate awareness levels and risk factors for diabetes mellitus among individuals from diverse age groups and demographic backgrounds. The study was conducted among participants residing in selected urban, suburban, and rural communities to provide broad population representation.

Data were collected using a structured and self-administered questionnaire specifically designed for diabetes awareness and risk assessment. The questionnaire consisted of multiple sections covering socio-demographic characteristics (age, gender, educational status, occupation, and place of residence), knowledge of diabetes mellitus, awareness of its causes, symptoms, complications, preventive measures, lifestyle practices, family history of diabetes, and individual risk factors associated with the disease. Additionally,

participants' attitudes toward diabetes screening, regular health check-ups, and disease prevention were assessed . Prior to data collection, the questionnaire was pretested through a pilot study involving a small group of respondents to evaluate its clarity, relevance, comprehensibility, and reliability. Necessary modifications were made based on the feedback obtained during the pilot phase to ensure the validity of the survey instrument. Participants were recruited using a convenience sampling technique, whereby individuals who met the inclusion criteria and were willing to participate were approached and invited to complete the survey. Eligible participants included adolescents and adults aged below 18 years to above 45 years. Participation in the study was entirely voluntary. Before enrollment, all participants were provided with detailed information regarding the objectives and procedures of the study. Informed consent was obtained from each participant prior to data collection. For participants under 18 years of age, consent was obtained from a parent or legal guardian when required. Confidentiality and anonymity of the respondents were strictly maintained throughout the study, and all collected information was used solely for research purposes. The collected data were systematically organized, coded, and analyzed using appropriate statistical methods. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize demographic characteristics, levels of diabetes awareness, and the distribution of risk factors among participants. The findings were presented using tables, charts, and graphs to facilitate interpretation and understanding of the results. This methodology enabled a comprehensive assessment of public awareness regarding diabetes mellitus and the prevalence of associated risk factors, thereby providing valuable insights for future health education and preventive intervention programs.

Questionnaire Design

SI no.	Question	Motive
01.	What age group do you belong to?	To assess the distribution of participants across different age groups and determine whether diabetes awareness and risk factors vary with age.
02.	What is your gender?	To collect demographic information and identify any gender-related differences in diabetes awareness, risk factors, and preventive practices.
03.	Educational Qualification	To evaluate whether educational level influences knowledge, awareness, and preventive behaviors related to diabetes**.**
04.	Occupation	To identify participants' occupational backgrounds and examine their relationship with diabetes awareness and lifestyle-related risk factors**.**
05.	Area of Residence	To compare diabetes awareness and risk factors among urban, rural, and suburban populations and identify regional differences.
06.	Marital Status	To assess demographic characteristics and explore any association between marital status and diabetes-related knowledge or behaviors.
07.	Have you heard about diabetes?	To determine the overall level of public awareness regarding diabetes among the study population.
08.	What type of diabetes are you aware of?	To evaluate participants' knowledge of different types of diabetes, including Type 1, Type 2, and Gestational Diabetes.
09.	Do you think diabetes is a serious health condition?	To assess participants' perception of the severity and public health impact of diabetes.
10.	Which of the following are symptoms of diabetes?	To measure participants' knowledge of common diabetes symptoms and identify knowledge gaps.
11.	What are the risk factors for diabetes?	To assess awareness of major diabetes risk factors and evaluate participants' understanding of disease prevention.
12.	Can diabetes be prevented?	To determine participants' beliefs and knowledge regarding the prevention of diabetes through healthy lifestyle practices.
13.	Do you have a family history of diabetes?	To identify hereditary risk factors and evaluate the prevalence of diabetes within participants' families.
14.	How often do you exercise?	To learn about people's activity levels, which matter for preventing and controlling diabetes.
15.	How would you describe your diet?	To evaluate dietary habits and determine their potential contribution to diabetes risk and prevention.

16.	Do you consume sugary drinks frequently?	To assess consumption patterns of sugary beverages, which are recognized risk factors for Type 2 Diabetes Mellitus.
17.	What is your Body Mass Index (BMI)?	To identify participants' weight status and evaluate obesity as a potential risk factor for diabetes.
18.	Have you ever checked your blood sugar level?	To assess awareness and participation in diabetes screening practices among the population.
19.	How often do you check your blood sugar level?	To evaluate the frequency of blood glucose monitoring and participants' engagement in preventive health practices.
20.	Have you ever been diagnosed with diabetes?	To determine the prevalence of diabetes among the surveyed population.
21.	If diagnosed, what type?	To identify the distribution of different types of diabetes among diagnosed participants**.**
22.	Do you believe lifestyle changes can help manage diabetes?	To assess participants' attitudes toward lifestyle modification as a strategy for diabetes management and prevention.
23.	What is your primary source of information about diabetes?	To identify the most common channels through which participants obtain diabetes-related information and guide future educational initiatives.
24.	Would you like to receive more information about diabetes prevention?	To determine the need for additional diabetes education and assess participants' interest in preventive health information.

3. RESULTS & DISCUSSION

This chapter presents a comprehensive analysis of the data obtained from a structured questionnaire administered to 175 participants. The findings encompass various aspects, including demographic characteristics, knowledge and awareness of diabetes mellitus, behavioral and lifestyle-related risk factors, diagnostic and treatment practices, preventive measures, and perceptions regarding diabetes mellitus and awareness. The results are systematically summarized in tables and figures to illustrate the distribution of responses and identify key patterns and trends. Furthermore, the findings provide valuable insights into the epidemiology of among diabetes young adults, highlighting factors that may influence susceptibility, management practices, and awareness levels within the study population.

3.1. RESULTS

Survey Variable	Response Category	Frequency	Percentage (%)
1. Age	Below 18	2	1.1%
	18-25	114	65.1%
	26-35	48	27.4%
	36-45	4	2.3%
	46-60	6	3.4%
	Above 60	1	0.6%
2. Gender	Male	67	38.3%
	Female	108	61.7%
3. Educational Qualification	Primary school	0	0%
	Secondary school	9	5.1%
	Undergraduate	133	76%
	Postgraduate	33	18.9%
4. Occupational Status	Student	130	74.3%
	Homemaker	7	4%
	Service holder	27	15.4%
	Entrepreneur or businesses person	11	6.3%
5.Area of Residence	Urban	153	87.4%
	Rural	12	6.9%
	Suburban	10	5.7%
6.Marital Status	Single	125	71.4%
	Married	50	28.6%
7.Awareness of diabetes	Yes	159	90.9%
	No	16	9.1%
8.Type of diabetes	Type 1 Diabetes	108	61.7%
	Type 2 Diabetes	101	57.7%

	Gestational Diabetes	46	26.3%
	Don’t know	49	28%
9. Severity of diabetes condition	Yes	172	98.3%
	No	3	1.7%
10. Symptoms of diabetes	Frequent urination	135	77.1%
	Excessive thirst	100	57.1%
	Unexplained weight loss	85	48.6%
	fatigue	72	41.1%
	Blurred vision	70	40%
	Don’t know	17	9.7%
11. Factors of diabetes	Obesity	91	52%
	Family history	141	80.6%
	Physical inactivity	106	60.6%
	Smoking	40	22.9%
	High suger diet	110	62.9%
12. Prevention of diabetes	Yes	129	73.7
	No	46	26.3%
13. Family history	Yes	133	76%
	No	42	24%
14.exercise	Daily	22	12.6 %
	3-5 times a week	24	13.7%
	1-2 times a week	24	13.7%
	Rarely	78	44.6%
	Never	27	15.4%
15.Description of diet	Balanced	102	58.3%
	Mostly healthy (fruits, vegetables)	22	12.6%
	Not sure	22	12.6%
16.sugary drinks frequency	Daily	37	21.1%
	A few times a week	49	28%
	Occasionally	56	32%
	Rarely	23	13.1%
17.Body Mass Index (BMI)	Below 18.5	18	12.2%
	18.5-24.9	85	57.4%
	25-29.9	36	24.4%
	30.0-higher	9	6.1%

18.blood sugar level	Yes	102	58.3%
	No	73	41.7%
19.Reviewed blood suger	Daily	3	1.7%
	Every 3-6 months	25	14.3%
	Once a year	17	9.7%
	Only when sick	44	25.1%
	Rarely	86	49.1%
20.Detection of diabetes	Yes	22	12.6%
	No	153	87.4%
21.Diagnosed type	Type 1	35	51.5%
	Type 2	13	19.1%
	Gestational	20	29.4%
22.Perceptionof lifestyle management cure diabetes	Yes	172	98.3%
	No	3	1.7%
23. primary source of information about diabetes	Doctor /healthcare professional	108	61.7%
	Internet	87	49.7%
	Social media	64	36.6%
	Tv /radio	30	17.1%
	Family /friends	112	64%
	School /college	53	30.3%
24. interest in receving more information	Yes	147	84%
	No	28	16%

3.2 DISCUSSION

Following the demographic overview of the respondents, the survey findings are presented and analyzed systematically according to the 24 questionnaire items related to diabetes awareness, risk factors, lifestyle practices, and preventive behaviors. Each section focuses on a specific aspect of diabetes knowledge and risk assessment, allowing for a comprehensive evaluation of participants' perceptions and health-related practices.

To enhance clarity and facilitate interpretation, the results are accompanied by graphical representations derived from the survey data. The analysis highlights key response patterns concerning awareness of diabetes, recognition of symptoms and risk factors, family history, dietary habits, physical activity, blood sugar monitoring practices, and attitudes toward diabetes prevention and management.

Furthermore, the discussion examines the public health significance of the findings, with particular emphasis on modifiable lifestyle factors, early detection practices, healthcare-seeking behavior, and preventive strategies. This structured approach ensures that all survey objectives are thoroughly addressed while providing meaningful insights into the current level of diabetes awareness and risk among the study population.

3.2.1. Age

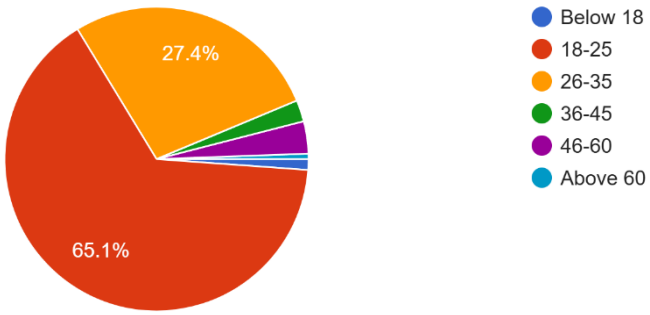


Fig. 3.2.1. Age Distribution

Age distribution of the respondents demonstrates that the study population was largely dominated by young adults, with participants representing a wide range of age categories. Among the total respondents, the majority (65.1%) belonged to the 18–25 years age group, making it the most represented category in the survey. This finding indicates that young adults constituted the primary target population and were more actively engaged in participating in the study. The high proportion of respondents within this age range may be attributed to the widespread use of digital platforms, greater accessibility to online surveys, and increased participation of students and young professionals in research activities.

The second-largest age category was 26–35 years, accounting for 27.4% of the respondents. Individuals within this age group are generally considered to be in their most productive years and are often more concerned about maintaining a healthy lifestyle and preventing chronic diseases. Their substantial representation in the survey provides valuable insights into the awareness and perception of diabetes among working-age adults.

In contrast, the proportion of respondents aged below 18 years, 36–45 years, 46–60 years, and above 60 years was relatively small. Although these groups constituted only a minor segment of the study population, their inclusion was important for ensuring age diversity and obtaining perspectives from different stages of life. The lower participation rates among older adults may be due to limited access to online survey tools, lower familiarity with digital technologies, or reduced engagement in survey-based research compared to younger individuals.

The predominance of younger respondents suggests that the overall findings of the study are largely reflective of the knowledge, attitudes, and perceptions of younger generations regarding diabetes and its associated risk factors. Younger individuals are generally more exposed to health information through educational institutions, social media platforms, healthcare campaigns, and internet-based resources, which may

influence their level of awareness. At the same time, the relatively limited representation of older age groups should be considered when interpreting the results, as diabetes prevalence and risk tend to increase with age.

From a public health perspective, the age distribution highlights the importance of assessing diabetes awareness among young adults, as this population represents the future workforce and can play a significant role in adopting preventive behaviors early in life. Improving awareness and encouraging healthy lifestyle choices among younger individuals may contribute to reducing the future burden of diabetes and its complications. Therefore, the age profile of the respondents provides valuable context for understanding the patterns of diabetes awareness and risk assessment observed in this study.

3.2.2. GENDER

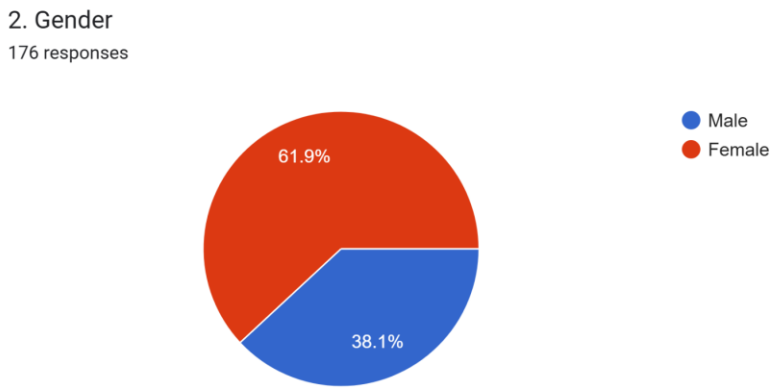


Fig. 3.2.2. Gender Distribution

The gender distribution of the respondents provides valuable information about the demographic characteristics of the study population and helps in understanding how diabetes awareness and risk perceptions may vary between males and females. Gender is an important determinant of health knowledge, healthcare-seeking behavior, lifestyle choices, and disease prevention practices. Therefore, examining the gender composition of the participants is essential for interpreting the findings of the diabetes awareness and risk assessment survey.

The results revealed that female respondents constituted the majority of the study population, accounting for 61.7% of the total participants, while male respondents represented 38.3%. This indicates that females were more actively involved in the survey and demonstrated a higher level of participation compared to males. The greater representation of female respondents may reflect a stronger interest in health-related topics, preventive healthcare practices, and participation in public health research.Several factors may explain the higher participation rate among women. Females are often more attentive to health-related information and are generally more willing to engage in discussions regarding disease prevention, health promotion, and personal well-being. They are also more likely to participate in surveys and educational programs related to healthcare. In many societies, women frequently play a central role in managing family health, making healthcare decisions, and caring for family members with chronic illnesses. As a result, they may possess a greater interest in acquiring knowledge about diseases such as diabetes and understanding strategies for prevention and management.

The substantial proportion of female respondents suggests that the overall findings of the study may be strongly influenced by female perspectives regarding diabetes awareness, risk factors, symptoms, complications, and preventive measures. Women often demonstrate higher levels of health consciousness and are more likely to seek medical advice, attend health screenings, and adopt preventive health behaviors.

Consequently, the responses obtained from female participants may reflect a relatively greater awareness of diabetes-related issues.

Male respondents, although fewer in number, still represented a significant portion of the study population. Their inclusion is important because men may exhibit different patterns of health behavior, risk perception, and healthcare utilization. Research has shown that men are often less likely to participate in preventive healthcare activities, seek medical attention promptly, or engage in health education programs. Therefore, understanding the level of diabetes awareness among male participants provides valuable insights into potential gaps in knowledge and areas where targeted educational interventions may be required.

Gender differences can also influence exposure to diabetes risk factors. Lifestyle behaviors such as dietary habits, physical activity levels, occupational stress, smoking, alcohol consumption, and healthcare-seeking practices may vary between males and females. These differences can affect both the risk of developing diabetes and the level of awareness regarding the disease. By including participants from both genders, the study was able to capture a broader range of experiences and perspectives related to diabetes awareness and risk assessment.

From a public health perspective, the observed gender distribution highlights the importance of developing gender-sensitive health education programs. Awareness campaigns should be designed to effectively reach both males and females while considering their unique health behaviors, information-seeking patterns, and healthcare needs. Special attention may be required to encourage greater participation of men in health promotion activities and diabetes screening programs, as lower engagement may contribute to delayed diagnosis and poorer health outcomes.

Furthermore, the predominance of female respondents may indicate that women are more receptive to public health messaging and preventive healthcare initiatives. This presents an opportunity to utilize women as key agents in promoting diabetes awareness within families and communities. Since women often influence household dietary practices, lifestyle choices, and healthcare decisions, increasing their knowledge about diabetes may have a positive impact on the health of other family members as well.

Overall, the gender distribution of the study demonstrates a higher participation rate among females compared to males. While female respondents constituted nearly two-thirds of the study population, the inclusion of both genders ensured that diverse viewpoints were represented. The findings emphasize the importance of considering gender differences when evaluating diabetes awareness and designing public health interventions. A balanced understanding of male and female perspectives can contribute to the development of more effective strategies for diabetes prevention, early detection, and health promotion across the population.

3.2.3. Educational Qualification

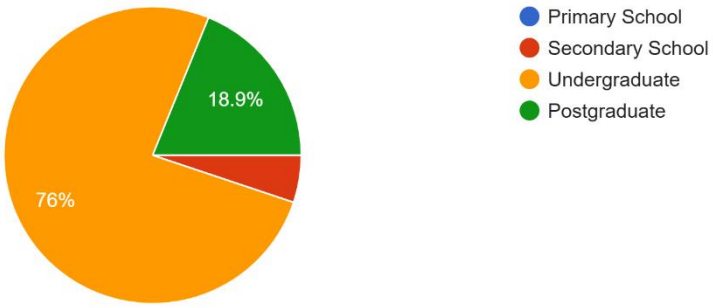


Fig. 3.2.3 Educational Attainment

The educational qualification of respondents is an important demographic characteristic that provides insight into the overall educational background of the study population and its potential influence on diabetes awareness and risk perception. Education plays a critical role in shaping an individual's ability to access, understand, interpret, and utilize health-related information. Therefore, assessing the educational status of participants is essential for understanding the level of knowledge and awareness regarding diabetes mellitus and its associated risk factors.

The findings of the survey indicate that the majority of respondents (76.0%) were undergraduate students or graduates, making this the largest educational category represented in the study. This substantial proportion suggests that most participants had attained a relatively high level of formal education and were likely exposed to a wide range of academic, social, and health-related information. The dominance of this group may be attributed to the accessibility of educational institutions, increased participation of students in research activities, and greater familiarity with online survey platforms.

The second-largest educational category consisted of postgraduate participants (18.9%). Individuals with postgraduate education generally possess advanced academic knowledge, critical thinking skills, and greater exposure to scientific and health-related information. Their participation adds valuable perspectives to the study, as they may have a deeper understanding of disease prevention, healthy lifestyle practices, and the importance of regular health monitoring. The inclusion of postgraduate respondents enhances the overall educational diversity of the sample and contributes to a more comprehensive assessment of diabetes awareness.

In contrast, only a small proportion of respondents reported having primary-level or secondary-level education. Although these groups represented a limited percentage of the study population, their participation remains important because educational attainment can significantly influence health literacy and awareness. Individuals with lower levels of education may have fewer opportunities to access reliable health information and may face greater challenges in understanding complex medical concepts related to diabetes, its causes, symptoms, complications, and preventive

measures.The predominance of respondents with higher education suggests that the study population was generally well educated. This characteristic is particularly relevant because education is widely recognized as one of the strongest predictors of health literacy. Health literacy refers to an individual's ability to obtain, process, and understand basic health information needed to make informed decisions regarding their health. People with higher levels of education are often better equipped to interpret medical information, understand disease risk factors, follow treatment recommendations, and adopt preventive health behaviors.

Higher educational attainment is also associated with increased awareness of chronic diseases such as diabetes mellitus. Educated individuals are more likely to encounter health information through academic coursework, scientific publications, digital media, healthcare professionals, and public health campaigns. As a result, they may possess greater knowledge regarding the causes of diabetes, including obesity, physical inactivity, unhealthy dietary habits, genetic predisposition, and other lifestyle-related risk factors. Furthermore, they are often more aware of the importance of regular exercise, balanced nutrition, routine medical check-ups, and early disease detection.

The educational profile observed in this study may therefore have contributed to relatively high levels of diabetes awareness among respondents. Participants with undergraduate and postgraduate education are generally more likely to recognize the symptoms of diabetes, understand its long-term complications, and appreciate the value of preventive measures. This increased awareness can positively influence health-related decision-making and encourage the adoption of healthier lifestyles that reduce the risk of developing diabetes.

From a public health perspective, the findings highlight the important relationship between education and disease prevention. Educational institutions serve as valuable platforms for disseminating health information and promoting awareness about chronic diseases. Individuals with higher education are often more receptive to evidence-based health messages and may be more willing to participate in preventive healthcare programs, screening initiatives, and health promotion activities. However, the relatively small representation of respondents with lower educational attainment should also be considered when interpreting the study findings. Since the survey population was largely composed of highly educated individuals, the overall level of diabetes awareness observed in the study may be higher than that of the general population. Individuals with limited education may have different levels of knowledge, attitudes, and health behaviors that are not fully reflected in the results. Therefore, future studies should aim to include a more balanced representation of educational backgrounds to obtain a broader understanding of diabetes awareness across different segments of society. Furthermore, the results emphasize the need for tailored health education programs that address the specific needs of individuals with varying educational levels. While highly educated populations may benefit from advanced information regarding disease prevention and management, individuals with lower educational attainment may require simpler, more accessible, and culturally appropriate health communication

strategies. Such targeted approaches can help reduce disparities in health knowledge and improve diabetes awareness across all educational groups.

In conclusion, the educational qualification data indicate that the study population was predominantly composed of undergraduate and postgraduate participants, reflecting a generally well-educated sample. This high level of educational attainment likely contributed to greater health literacy and a better understanding of diabetes, its risk factors, complications, and preventive measures. The findings underscore the significant role of education in promoting health awareness and highlight the importance of developing inclusive educational interventions that reach individuals across all levels of educational achievement.

3.2.4. Occupation

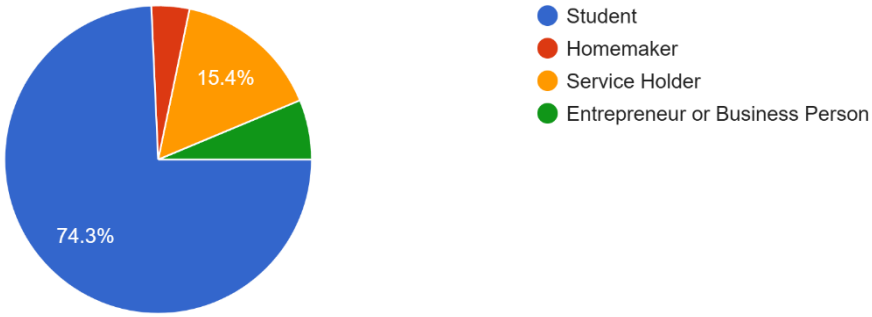


Fig. 3.2.4. Occupational Status

The occupational distribution of the respondents provides valuable insight into the socioeconomic and professional background of the study population. Occupation is an important demographic factor because it can significantly influence an individual's lifestyle, health behaviors, access to healthcare services, exposure to health information, and overall awareness of chronic diseases such as diabetes mellitus. By examining the occupational status of participants, the study gains a better understanding of the population groups represented and how occupational characteristics may relate to diabetes awareness and risk assessment. The findings revealed that students constituted the largest proportion of respondents, accounting for 74.3% of the total sample. This indicates that the survey population was predominantly composed of individuals who were actively engaged in educational activities. The overwhelming representation of students suggests that the study primarily captured the perspectives, knowledge, and attitudes of younger individuals who are pursuing academic qualifications. This finding is consistent with the age distribution of the respondents, where the majority belonged to the 18–25 years age group. The high participation of students may be attributed to several factors. Students generally have greater access to digital communication platforms, social media, educational networks, and online survey tools, making them more likely to participate in research studies. Additionally, students are often exposed to health-related information through academic courses, institutional awareness programs, seminars, workshops, and online educational resources. As a result, they may possess a relatively higher level of awareness regarding health issues, including diabetes and its associated risk factors.

The dominance of students in the survey is particularly important because young adulthood represents a crucial stage for establishing lifelong health habits. During this period, individuals begin making independent decisions regarding diet, physical activity, sleep patterns, stress management, and other lifestyle behaviors that directly influence their future risk of developing chronic diseases. Therefore, assessing diabetes

awareness among students provides valuable information about the effectiveness of current health education efforts and the potential for promoting preventive behaviors at an early stage of life.

The second-largest occupational category consisted of service holders, who represented 15.4% of the respondents. This group includes individuals employed in various public and private sector occupations. Service holders often experience work-related responsibilities, time constraints, and occupational stress that may affect their lifestyle choices and health status. Their participation in the study contributes important perspectives regarding diabetes awareness among working adults. Since employment-related factors such as sedentary work environments, prolonged sitting, irregular eating habits, and job-related stress are recognized risk factors for diabetes, understanding the awareness levels of service holders is particularly relevant for public health planningA smaller proportion of respondents were identified as entrepreneurs or businesspersons. Individuals in this category typically manage business operations and may encounter unique lifestyle challenges, including irregular schedules, occupational stress, limited physical activity, and inconsistent dietary patterns. Although their representation in the study was relatively limited, their inclusion provides additional insight into diabetes awareness among self-employed individuals and business professionals.The occupational profile observed in this study reflects a population that is largely educated and academically engaged. The predominance of students, combined with the high proportion of respondents possessing undergraduate and postgraduate qualifications, suggests that the survey primarily represents individuals with relatively high educational attainment and health literacy. This demographic characteristic may have positively influenced the overall level of diabetes awareness observed among respondents.

Occupation is closely linked to several factors that affect diabetes risk, including income level, educational opportunities, access to healthcare, work-related stress, physical activity patterns, and dietary habits. Different occupational groups may therefore exhibit varying levels of awareness and distinct risk profiles. For example, students may be more knowledgeable about diabetes due to educational exposure, whereas working professionals may face greater lifestyle-related risks due to occupational demands. Understanding these differences is essential for designing targeted awareness campaigns and preventive interventions.

Overall, the occupational distribution indicates that the study population was predominantly composed of students, followed by service holders, with smaller contributions from entrepreneurs/businesspersons and homemakers. This pattern reflects the strong representation of young, educated individuals within the survey and provides valuable context for interpreting the findings related to diabetes awareness and risk assessment. The results highlight the need for tailored health promotion initiatives that address the unique characteristics and health needs of different occupational groups in order to improve diabetes prevention and awareness across the broader population.

3.2.5. Area of Residence

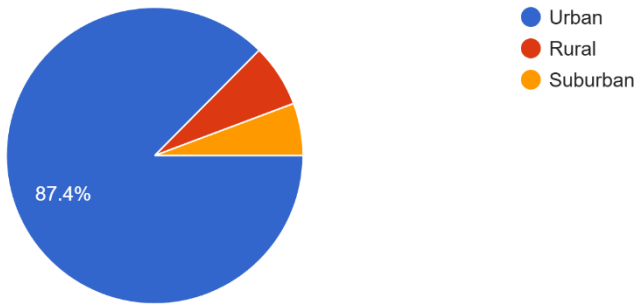


Fig. 3.2.5. Area of Residence

The distribution of respondents according to their area of residence provides important insights into the geographical characteristics of the study population and helps in understanding how living environments may influence diabetes awareness and risk perception. Place of residence is a significant determinant of health because it affects access to healthcare services, educational opportunities, health information, lifestyle patterns, and preventive healthcare practices. Therefore, examining the residential background of participants is essential for interpreting the findings of the diabetes awareness and risk assessment survey.

The high proportion of urban respondents may be attributed to greater internet accessibility, higher levels of digital literacy, and increased participation in online surveys among city residents. Urban populations generally have better access to smartphones, computers, and internet services, making them more likely to encounter and respond to online research questionnaires. Furthermore, urban residents often have greater exposure to educational institutions, healthcare facilities, and public health campaigns, which may contribute to their willingness to participate inhealth-related studies.Urban living is often associated with increased access to healthcare infrastructure, including hospitals, clinics, diagnostic centers, pharmacies, and specialized medical services. As a result, individuals residing in urban areas may have more opportunities to receive health education, undergo routine medical check-ups, and obtain information regarding chronic diseases such as diabetes. This enhanced access to healthcare resources can positively influence their level of awareness regarding diabetes symptoms, risk factors, complications, preventive measures, and treatment options.

In addition to healthcare accessibility, urban residents are generally exposed to a greater volume of health-related information through various sources, including television, newspapers, social media platforms, educational programs, community campaigns, and digital health resources. Such exposure may contribute to a higher level of health literacy and a better understanding of diabetes prevention and management. Consequently, the relatively high awareness levels observed in this study may, in part, be influenced by the substantial representation of urban participants.In contrast,

respondents from rural and suburban areas constituted only a small proportion of the total sample. Although their representation was limited, these groups provide valuable perspectives because health awareness, healthcare access, and lifestyle characteristics may differ considerably from those of urban populations. Rural residents often face challenges such as limited healthcare facilities, reduced availability of specialized medical services, lower exposure to public health campaigns, and barriers to accessing health information. These factors can influence both diabetes awareness and healthcare-seeking behavior.

The comparatively low participation of rural and suburban respondents may be due to factors such as limited internet access, lower engagement with online survey platforms, and geographical barriers. As a result, the findings of the study may not fully capture the awareness levels and risk profiles of individuals residing outside urban areas. This limitation should be considered when interpreting the results and generalizing them to the broader population.

From a public health perspective, the residential distribution highlights the need for location-specific diabetes awareness and prevention strategies. While urban populations may benefit from continued education focusing on lifestyle modification and risk reduction, greater efforts may be required to improve awareness and access to healthcare services in rural and underserved communities. Expanding health education campaigns, screening programs, and community-based interventions in non-urban areas could help reduce disparities in diabetes knowledge and prevention. Overall, the area-of-residence analysis demonstrates that the study population was predominantly urban, with a large majority of respondents residing in city environments. This urban concentration likely contributed to higher levels of exposure to healthcare resources, educational opportunities, and health information. At the same time, it highlights the importance of ensuring broader participation from rural and suburban populations in future studies to obtain a more comprehensive understanding of diabetes awareness and risk factors across different residential settings.

3.2.6. Marital Status

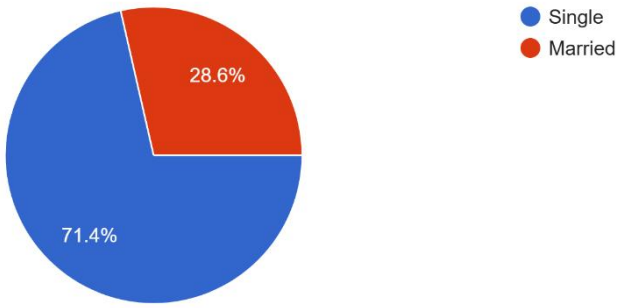


Fig. 3.2.6. Marital Status

The marital status distribution of the respondents provides important demographic information that helps in understanding the social background of the study population. The results indicate that the majority of respondents (71.4%) were single, while 28.6% were married. This finding suggests that the survey population was predominantly composed of unmarried individuals. The high proportion of single respondents is consistent with the age distribution observed in the study, where most participants belonged to the 18–25 years age group. Individuals within this age range are typically pursuing higher education, developing careers, and have not yet entered married life. Consequently, the responses obtained from the survey largely reflect the perspectives and awareness levels of younger adults.

Marital status can influence health-related behaviors and awareness in several ways. Married individuals often experience greater family responsibilities and may be more concerned about maintaining their health to support their families. They may also have increased exposure to healthcare services through their spouses and children. On the other hand, single individuals may have different lifestyle patterns, dietary habits, and health-seeking behaviors. Understanding the marital status of respondents therefore provides valuable context for interpreting diabetes awareness and risk perception within the study population.

Overall, the findings indicate that the survey primarily reflects the views of unmarried young adults, although the inclusion of married participants contributes additional perspectives regarding diabetes awareness and prevention.

3.2.7. Awareness of Diabetes

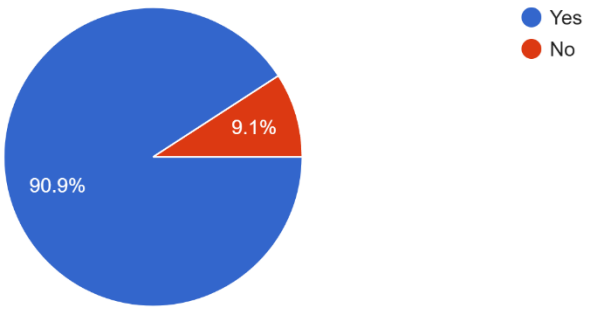


Fig. 3.2.7. Awareness of Diabetes

The results show that 90.9% of respondents reported that they had heard about diabetes, whereas only 9.1% indicated that they had not heard of the condition. This demonstrates a remarkably high level of general awareness regarding diabetes among the study participants.

The high awareness level may be attributed to the educational background of the respondents, the widespread availability of health information through digital media, educational institutions, healthcare providers, and public health campaigns. Since diabetes is one of the most common chronic diseases worldwide, information about its causes, symptoms, complications, and prevention is frequently disseminated through various channels. This finding is encouraging from a public health perspective because awareness serves as the foundation for disease prevention and early detection. Individuals who are familiar with diabetes are generally more likely to recognize risk factors, adopt healthier lifestyles, and seek medical advice when symptoms arise. However, simply having heard of diabetes does not necessarily imply comprehensive knowledge about the disease. Therefore, continued educational efforts remain important to ensure that awareness translates into accurate understanding and appropriate preventive behaviors.

Overall, the results suggest that diabetes has achieved a high level of recognition among the surveyed population, reflecting the effectiveness of existing awareness initiatives.

3.2.8. Types of Diabetes Awareness

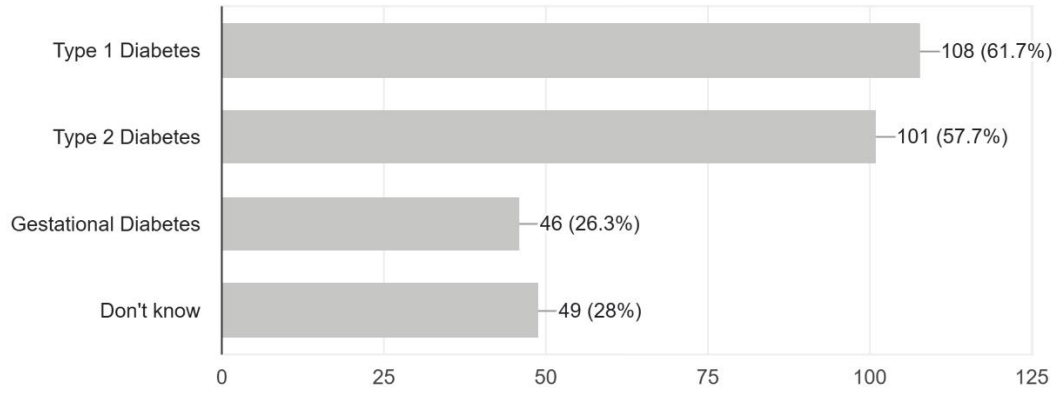


Fig. 3.2.8. Knowledge of Types of Diabetes

The survey assessed respondents' knowledge regarding different types of diabetes. The findings indicate that Type 1 Diabetes was the most recognized form, with 61.7% of respondents identifying it. This was closely followed by Type 2 Diabetes, which was recognized by 57.7% of participants. In contrast, only 26.3% of respondents were aware of Gestational Diabetes, while 28.0% reported that they did not know any specific type of diabetes.

The relatively high awareness of Type 1 and Type 2 diabetes suggests that these forms of the disease are more commonly discussed in educational materials, healthcare settings, and public awareness campaigns. Type 2 diabetes, in particular, is the most prevalent form worldwide and is frequently highlighted in health promotion programs because of its strong association with lifestyle factors such as obesity, poor diet, and physical inactivity.

The comparatively lower awareness of gestational diabetes is noteworthy. Gestational diabetes occurs during pregnancy and can have important health implications for both the mother and child. The lower recognition of this condition suggests a potential knowledge gap among respondents and highlights the need for increased public education regarding pregnancy-related diabetes and maternal health.

Additionally, the fact that more than one-quarter of respondents reported not knowing any specific type of diabetes indicates that, despite high general awareness of diabetes, detailed knowledge regarding its classifications remains limited for some individuals. This finding emphasizes the importance of educational programs that go beyond basic awareness and provide comprehensive information about the different forms of diabetes, their causes, risk factors, and management strategies.

Overall, the results suggest that while awareness of the major types of diabetes is relatively good, there remains room for improvement, particularly regarding gestational diabetes and detailed disease-specific knowledge.

3.2.9. Perception of Diabetes Severity

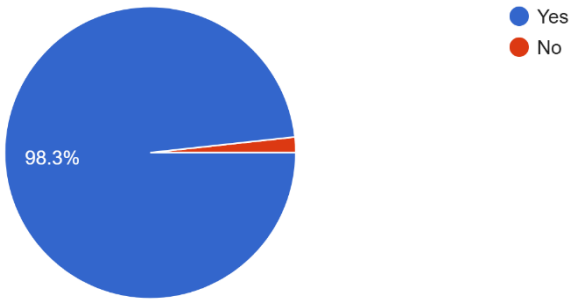


Fig. 3.2.9. Perception of Diabetes Severity

The survey findings reveal that an overwhelming majority of respondents (98.3%) considered diabetes to be a serious health condition, while only a very small proportion (1.7%) did not share this view. This indicates an exceptionally high level of recognition regarding the seriousness of diabetes among the study participants.

The strong perception of diabetes as a serious disease may stem from increasing public awareness of its long-term complications, including cardiovascular disease, kidney failure, nerve damage, vision loss, and other health problems. Many individuals may have encountered information about diabetes through healthcare professionals, educational campaigns, media sources, or personal experiences involving family members and acquaintances affected by the disease.

Recognizing diabetes as a serious health condition is an important factor in promoting preventive health behaviors. Individuals who understand the potential consequences of the disease are generally more likely to adopt healthier lifestyles, participate in screening programs, monitor their health status, and seek medical care when necessary. Such awareness can contribute significantly to reducing the burden of diabetes and preventing complications.

The very small proportion of respondents who did not perceive diabetes as serious suggests that misconceptions regarding the disease are relatively uncommon within this study population. Nevertheless, ongoing educational efforts remain essential to ensure that awareness is accompanied by accurate knowledge and appropriate preventive action.

Overall, the findings demonstrate a highly positive perception of diabetes severity among respondents, indicating widespread recognition of the disease as a major public health concern.

3.2.10 Which of the following are symptoms of diabetes?

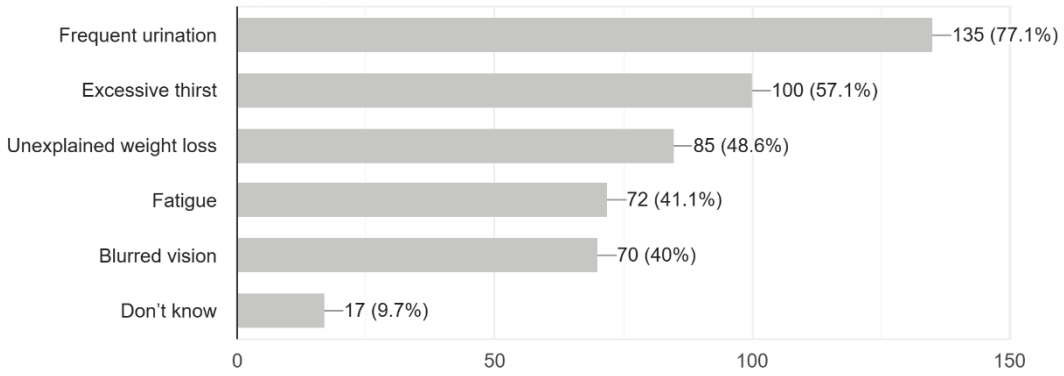


Fig. 3.2.10. Knowledge of Symptoms

The results of this survey indicate that respondents possessed a moderate to high level of awareness regarding the common symptoms associated with diabetes mellitus. Among the various symptoms listed, frequent urination was the most widely recognized symptom, identified by 135 respondents (77.1%). This finding suggests that a large majority of participants are familiar with one of the hallmark signs of diabetes. Frequent urination occurs when elevated blood glucose levels cause the kidneys to work harder to remove excess sugar from the bloodstream, resulting in increased urine production. The high recognition of this symptom may be attributed to public health campaigns, healthcare consultations, and widespread discussion of diabetes-related complications.

The second most commonly recognized symptom was excessive thirst, selected by 100 respondents (57.1%). Excessive thirst is closely linked to frequent urination, as the body loses significant amounts of fluid and attempts to compensate by triggering thirst. While more than half of the participants correctly identified this symptom, the percentage is noticeably lower than that for frequent urination. This difference may indicate that some respondents are aware of the more obvious manifestations of diabetes but may not fully understand the physiological relationship between its symptoms. Approximately 85 respondents (48.6%) recognized unexplained weight loss as a symptom of diabetes. This finding demonstrates that less than half of the participants were aware that sudden weight loss can occur when the body is unable to properly utilize glucose for energy and begins breaking down fat and muscle tissue instead. The relatively lower recognition of this symptom may reflect a lack of understanding of the metabolic effects of diabetes and suggests the need for further educational efforts.

Similarly, fatigue was identified by 72 respondents (41.1%), indicating that fewer than half of the participants associated persistent tiredness with diabetes. Fatigue is a common symptom resulting from the body's inability to efficiently use glucose as an energy source. Because fatigue can also occur in numerous other health conditions, respondents may not readily associate it specifically with diabetes. This finding

highlights a significant knowledge gap regarding less obvious but clinically important symptoms. Blurred vision was recognized by 70 respondents (40.0%), making it one of the least recognized symptoms among the options provided. Elevated blood glucose levels can cause changes in the eye lens, leading to temporary or persistent vision problems. The low level of recognition is concerning because blurred vision may be an early indicator of uncontrolled diabetes and, if ignored, can progress to more serious eye complications. This result suggests that public awareness regarding diabetes-related visual problems remains limited. Only 17 respondents (9.7%) selected the option "Don't know," indicating that the vast majority of participants were able to identify at least one symptom of diabetes. This relatively small proportion reflects a generally satisfactory level of awareness within the study population. Nevertheless, the fact that nearly one in ten respondents could not identify any symptoms suggests that a segment of the population remains vulnerable to delayed recognition and diagnosis of the disease.

Overall, the findings demonstrate that respondents are most familiar with the classic and widely publicized symptoms of diabetes, particularly frequent urination and excessive thirst. However, awareness declines considerably for symptoms such as unexplained weight loss, fatigue, and blurred vision. This pattern indicates that while basic knowledge of diabetes exists among most participants, understanding of the full range of clinical manifestations remains incomplete. Such knowledge gaps may hinder early detection, as individuals experiencing less recognized symptoms may fail to seek medical attention promptly.

From a public health perspective, these findings emphasize the importance of comprehensive diabetes education programs that not only focus on the most common symptoms but also highlight less recognized warning signs. Increasing awareness of all major symptoms can promote earlier diagnosis, timely intervention, better disease management, and ultimately reduce the risk of long-term complications such as cardiovascular disease, kidney damage, nerve disorders, and vision impairment. The results suggest that future awareness campaigns should place greater emphasis on educating individuals about the broader clinical presentation of diabetes to improve health outcomes and encourage proactive healthcare-seeking behavior.

3.2.11. Risk factors

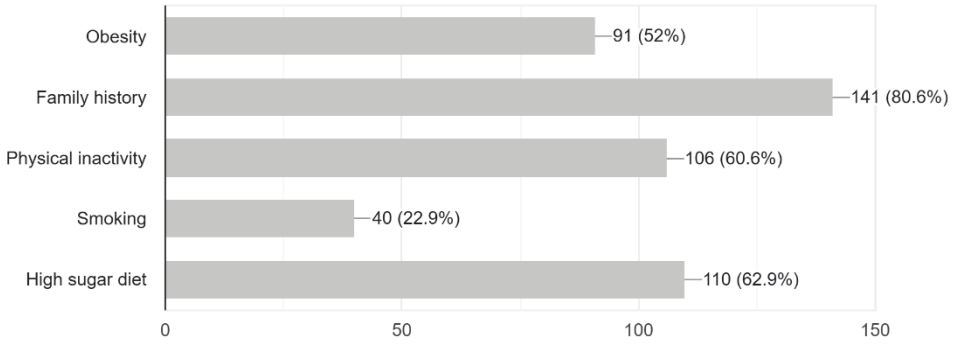


Fig. 3.2.11. Knowledge of Risk Factors

The survey results reveal a relatively high level of awareness regarding diabetes risk factors. Family history was the most frequently identified risk factor, recognized by 80.6% of respondents. This suggests that participants generally understand the role of genetic predisposition in the development of diabetes.

High sugar diet (62.9%) and physical inactivity (60.6%) were also widely recognized, indicating awareness of lifestyle-related contributors to diabetes. More than half of the respondents identified obesity (52.0%) as a risk factor, demonstrating moderate knowledge regarding the relationship between excess body weight and insulin resistance.

Smoking was identified by only 22.9% of participants, making it the least recognized risk factor. This finding suggests that many individuals may be unaware of the indirect role smoking plays in increasing diabetes risk and worsening disease outcomes. Overall, the results indicate good awareness of major risk factors but highlight the need for educational initiatives emphasizing lesser-known contributors such as smoking.

3.2.12 Can diabetes be prevented?

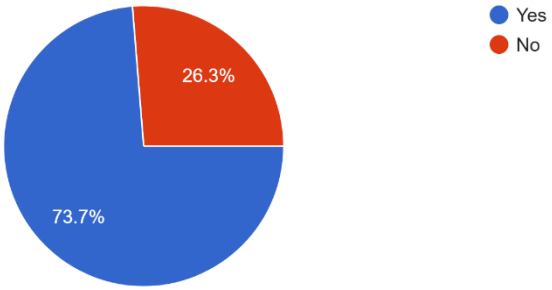


Fig. 3.2.12. Awareness of Diabetes Prevention

A substantial majority of respondents (73.7%) believed that diabetes can be prevented, reflecting a positive understanding of preventive health practices. This suggests that most participants recognize the importance of healthy lifestyle choices, including balanced nutrition, regular exercise, and weight management, in reducing the risk of developing Type 2 Diabetes Mellitus.

However, 26.3% of respondents believed that diabetes cannot be prevented. This misconception may arise from confusion regarding the hereditary nature of the disease or lack of knowledge about preventive strategies. The findings indicate a generally favorable level of awareness but also emphasize the need for community-based education programs to reinforce the concept that many cases of Type 2 diabetes are preventable through lifestyle modification.

3.2.13 Do you have a family history of diabetes?

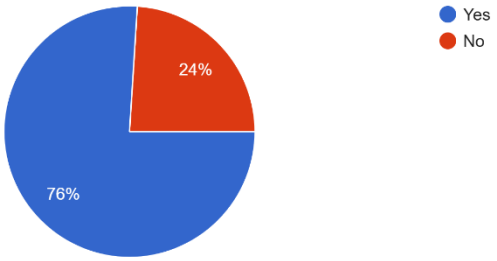


Fig. 3.2.13. Family History of Diabetes

The majority of respondents (76.0%) reported having a family history of diabetes, while only 24.0% reported no such history. This high prevalence suggests that a significant proportion of participants belong to families with an increased genetic susceptibility to diabetes.

Individuals with a positive family history are generally at greater risk of developing diabetes, particularly Type 2 Diabetes Mellitus. Therefore, the findings underscore the importance of regular health screening, early detection, and preventive interventions among high-risk populations. The high percentage also explains why family history was identified as the most recognized risk factor in the previous question.

3.2.14 How often do you exercise?

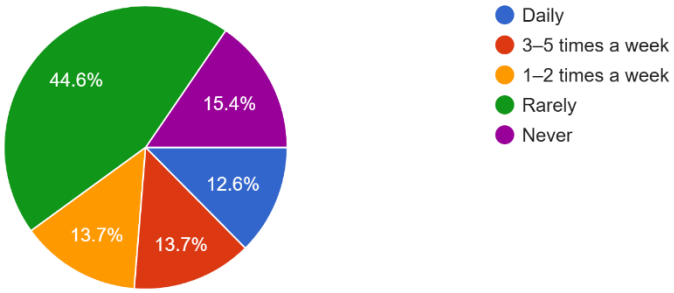


Fig. 3.2.14. Exercise Frequency

The results demonstrate relatively low levels of physical activity among respondents. Nearly half of the participants (44.6%) reported exercising rarely, making it the most common response. Additionally, 15.4% stated that they never exercise.

In contrast, only 12.6% reported exercising daily, while 13.7% exercised 3–5 times per week and another 13.7% exercised 1–2 times weekly. These findings indicate that a large proportion of respondents fail to meet recommended physical activity guidelines.

Physical inactivity is a well-established risk factor for Type 2 diabetes, obesity, and cardiovascular disease. Therefore, the high proportion of participants who rarely or never exercise may contribute to an increased risk of diabetes within the surveyed population. Health promotion programs should encourage regular physical activity as a key preventive measure.

3.2.15 How would you describe your diet?



Fig. 3.2.15. Dietary Pattern

More than half of the respondents (58.3%) described their diet as balanced, indicating a generally positive perception of their eating habits. This finding suggests that many participants believe they consume an appropriate combination of nutrients necessary for maintaining good health.

However, 16.6% reported consuming a diet high in sugary or fried foods, which may increase the risk of obesity, insulin resistance, and Type 2 diabetes. Additionally, only 12.6% described their diet as mostly healthy, while another 12.6% were uncertain about the quality of their diet.

The results indicate that although many respondents perceive their dietary habits positively, a notable proportion may still engage in unhealthy eating practices. Nutritional education programs should focus on improving understanding of healthy food choices and reducing the intake of sugar-rich and high-fat foods.

3.2.16 Do you consume sugary drinks frequently?

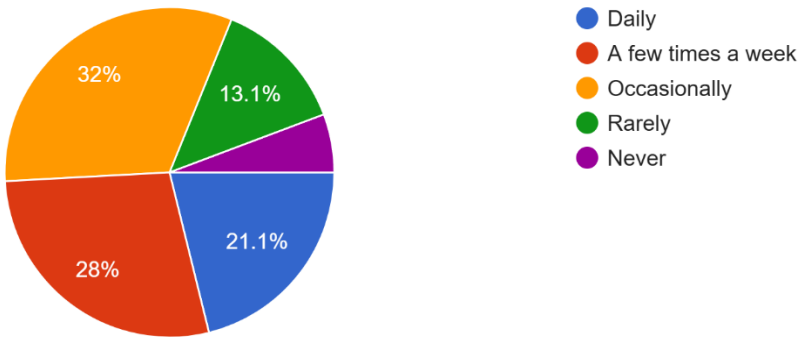


Fig. 3.2.16. Sugary Drink Consumption

The findings reveal a relatively high consumption of sugary beverages among respondents. The largest group (32.0%) reported consuming sugary drinks occasionally, while 28.0% consumed them a few times per week. Notably, 21.1% reported daily consumption.

Only 13.1% consumed sugary drinks rarely, and a small minority (5.8%) reported never consuming them. These results suggest that sugary beverage intake is common among the surveyed population.

Frequent consumption of sugar-sweetened beverages is associated with weight gain, obesity, insulin resistance, and an increased risk of Type 2 diabetes. Therefore, the high prevalence of regular sugary drink consumption highlights an important behavioral risk factor that should be addressed through health education and dietary interventions.Frequent consumption of sugar-sweetened beverages is associated with weight gain, obesity, insulin resistance, and an increased risk of Type 2 diabetes. Therefore, the high prevalence of regular sugary drink consumption highlights an important behavioral risk factor that should be addressed through health education and dietary interventions.

3.2.17 What is your Body Mass Index (BMI)?

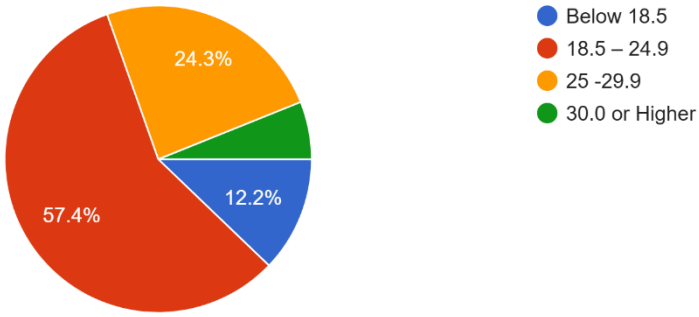


Fig. 3.2.17. Body Mass Index (BMI)

Among the 148 respondents who reported their BMI, the majority (57.4%) fell within the normal weight range (18.5–24.9). This finding suggests that most participants maintain a body weight considered healthy according to standard BMI classifications.

However, 24.3% of respondents were classified as overweight (BMI 25–29.9), while 6.1% were categorized as obese (BMI ≥30). Together, these groups account for approximately 30.4% of respondents, indicating that nearly one-third of participants have elevated body weight, which is a major risk factor for Type 2 diabetes.

Additionally, 12.2% of respondents were underweight (BMI <18.5). Although underweight status is not typically associated with Type 2 diabetes, it may indicate nutritional deficiencies or other health concerns. Overall, the BMI distribution suggests that while most respondents maintain a healthy weight, a significant proportion remain at increased risk for diabetes due to overweight and obesity.

3.2.18 Have you ever checked your blood sugar level?

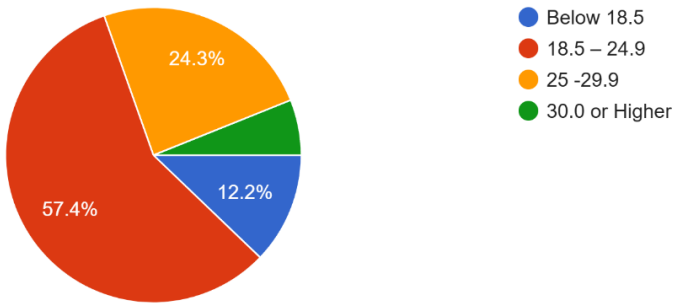


Fig. 3.2.18. Blood Sugar Testing

The findings indicate that more than half of the respondents (58.3%) have checked their

blood sugar levels at least once, suggesting a moderate level of health awareness and engagement in preventive healthcare practices. Blood glucose testing is an important step in identifying diabetes or prediabetes at an early stage, and the results demonstrate that a considerable proportion of participants recognize the importance of monitoring their blood sugar status.

However, a substantial percentage of respondents (41.7%) reported that they had never undergone blood sugar testing. This finding is concerning because diabetes often develops gradually and may remain asymptomatic in its early stages. Individuals who do not regularly screen for diabetes may remain unaware of elevated blood glucose levels until complications occur.

The relatively high proportion of participants who have never checked their blood sugar highlights potential barriers such as lack of awareness, fear of diagnosis, limited access to healthcare facilities, financial constraints, or the perception that testing is unnecessary in the absence of symptoms. These results emphasize the need for increased community-based screening programs and educational campaigns encouraging routine blood glucose monitoring, particularly among individuals with known risk factors such as obesity, family history of diabetes, physical inactivity, and unhealthy dietary habits.

3.2.19 How often do you check your blood sugar level?

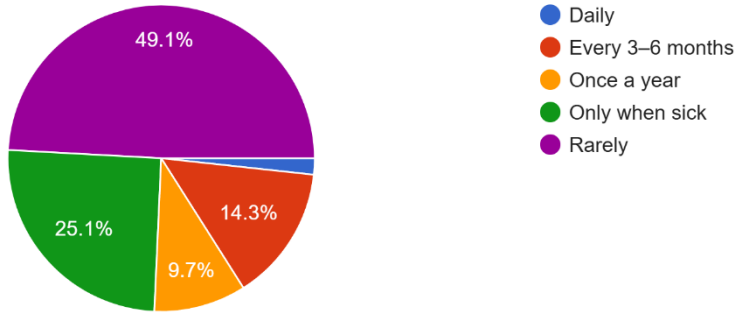


Fig.3.2.19. Blood Sugar Monitoring Frequency

The results reveal that blood sugar monitoring is generally infrequent among the respondents. Nearly half of the participants (49.1%) reported that they rarely check their blood sugar levels, making this the most common response. This suggests that routine monitoring is not a regular health practice for a significant portion of the population.

Approximately one-quarter (25.1%) indicated that they only check their blood sugar when they become ill. This behavior reflects a reactive approach to health management, where individuals seek testing only when symptoms or health concerns arise rather than engaging in preventive screening.A smaller proportion of respondents reported checking their blood sugar every 3–6 months (14.3%) or once a year (9.7%). These groups demonstrate a more proactive attitude toward health monitoring, although the frequency may still be insufficient for individuals at high risk of diabetes.Only a very small percentage reported daily monitoring. Daily blood glucose testing is generally recommended for individuals with diagnosed diabetes, particularly those requiring insulin therapy. The low proportion of daily testing is consistent with the relatively low percentage of participants diagnosed with diabetes.

Overall, the findings suggest that regular blood sugar monitoring is not widely practiced. This pattern may increase the likelihood of delayed diagnosis and treatment of diabetes. Public health initiatives should therefore focus on promoting routine screening and educating individuals about the benefits of early detection.

3.2.20 Have you ever been diagnosed with diabetes?

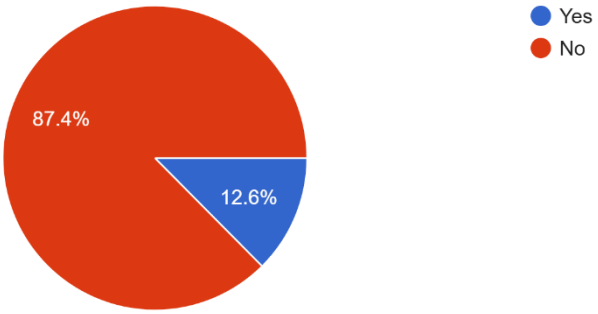


Fig. 3.2.20. Diabetes Diagnosis Status

The majority of respondents (87.4%) reported that they had never been diagnosed with diabetes, while only 12.6% indicated that they had received a diabetes diagnosis.

The relatively low prevalence of diagnosed diabetes within the study population may suggest that most respondents are currently free from the disease. However, this result should be interpreted cautiously because undiagnosed diabetes is a common public health issue. Since a large proportion of participants do not regularly monitor their blood glucose levels, some individuals may have diabetes or prediabetes without being aware of their condition.

The 12.6% prevalence of diagnosed diabetes is still significant and indicates that diabetes remains a major health concern within the surveyed population. Individuals diagnosed with diabetes require continuous monitoring, lifestyle modification, and adherence to treatment to prevent serious complications such as cardiovascular disease, kidney failure, neuropathy, and vision impairment.

These findings highlight the importance of regular screening, especially among high-risk groups, to ensure early diagnosis and timely intervention. The data also support the need for ongoing diabetes education and management programs within the community.

3.2.21 If diagnosed, what type?

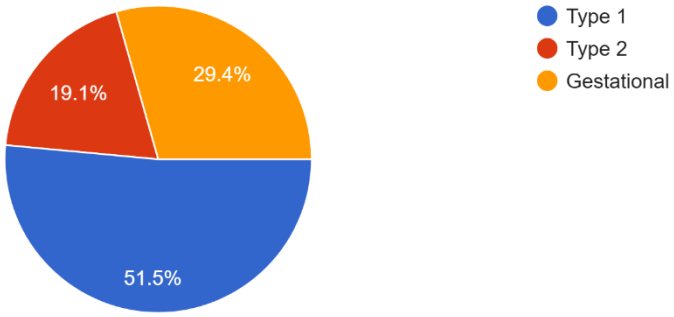


Fig. 3.2.21. Type of Diabetes Diagnosed

Among respondents who reported having diabetes, Type 1 diabetes was the most frequently reported form (51.5%), followed by gestational diabetes (29.4%) and Type 2 diabetes (19.1%).

The predominance of Type 1 diabetes suggests that a substantial proportion of diagnosed participants developed diabetes due to insufficient insulin production by the pancreas. Individuals with Type 1 diabetes require lifelong insulin therapy and regular blood glucose monitoring to maintain glycemic control.Nearly one-third of respondents reported gestational diabetes, indicating that diabetes occurring during pregnancy represents a significant concern among female participants. Gestational diabetes can increase the risk of complications during pregnancy and may also raise the likelihood of developing Type 2 diabetes later in life for both mother and child.

Type 2 diabetes accounted for 19.1% of diagnosed cases. Although lower than expected compared to global trends, this finding may reflect the demographic characteristics of the survey population. Type 2 diabetes is strongly associated with obesity, sedentary lifestyles, unhealthy diets, and advancing age.

Overall, the results demonstrate that different forms of diabetes affect the surveyed population and underscore the importance of disease-specific prevention, management, and educational strategies tailored to each type of diabetes.

3.2.22 Do you believe lifestyle changes can help manage diabetes? FIGURE : 22

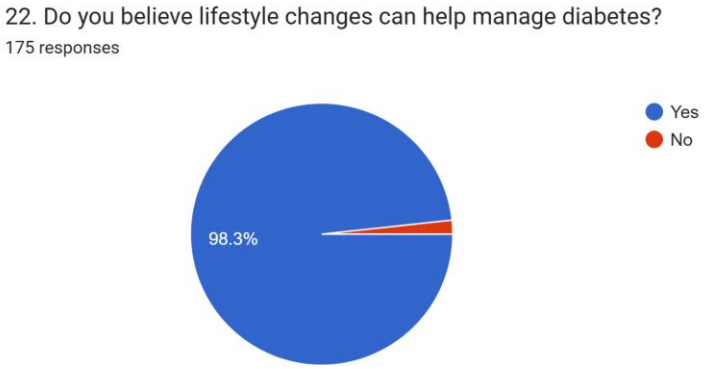


Fig. 3.2.22. Perception of Lifestyle Management

An overwhelming majority of respondents (98.3%) believe that lifestyle changes can help manage diabetes, indicating exceptionally high awareness regarding the role of healthy behaviors in diabetes control.

This finding demonstrates that most participants understand the importance of lifestyle interventions such as maintaining a balanced diet, engaging in regular physical activity, controlling body weight, reducing stress, avoiding tobacco use, and adhering to prescribed treatment plans. Such awareness is encouraging because lifestyle modification is widely recognized as one of the most effective approaches to preventing and managing diabetes.

The very small proportion of respondents (1.7%) who disagreed may reflect limited knowledge or misconceptions regarding diabetes management. These individuals may benefit from targeted educational programs to improve their understanding of the disease.

Overall, the results suggest that public health messages regarding the importance of healthy lifestyles have been successfully communicated to the majority of respondents. The challenge now lies in translating this knowledge into sustained behavioral change and long-term healthy practices.

3.2.23 Your primary source of information about diabetes

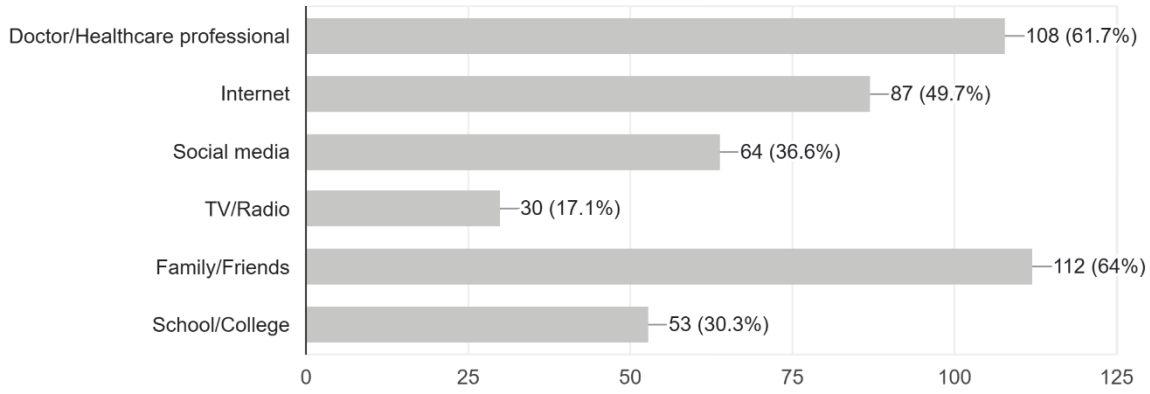


Fig. 3.2.23. Primary Source of Diabetes Information

The findings reveal that family and friends are the most common source of diabetes-related information (64.0%), followed closely by healthcare professionals (61.7%). This indicates that interpersonal communication plays a critical role in shaping public knowledge and awareness regarding diabetes.

The strong influence of healthcare professionals is encouraging because information obtained from medical experts is generally accurate, evidence-based, and reliable. This suggests that many respondents have access to professional guidance regarding diabetes prevention and management . Nearly half of respondents (49.7%) reported obtaining information from the internet, highlighting the growing role of digital resources in health education. While online platforms provide convenient access to information, they may also expose individuals to misinformation if reliable sources are not used. Social media was identified by 36.6% of respondents, reflecting its increasing influence on public health awareness. However, information shared through social media may vary in quality and accuracy, emphasizing the need for critical evaluation of online content. School and college education contributed to diabetes awareness among 30.3% of respondents, suggesting opportunities to further strengthen health education programs within academic institutions. TV and radio were the least utilized sources (17.1%), indicating a decline in the influence of traditional media compared to interpersonal and digital channels.

Overall, the results suggest that future diabetes awareness campaigns should utilize a combination of healthcare professionals, family networks, internet platforms, and social media to maximize outreach and effectiveness.

3.2.24 Would you like to receive more information about diabetes prevention?

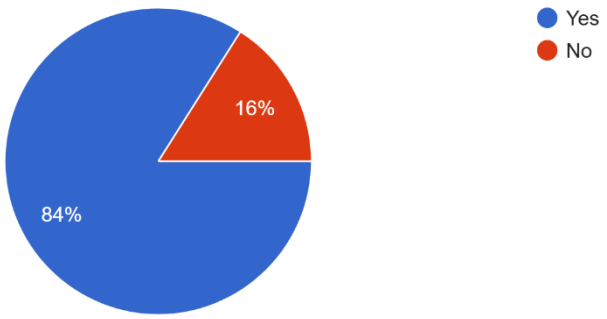


Fig. 3.2.24. Interest in Receiving More Information

The results demonstrate a strong interest among respondents in learning more about diabetes prevention, with 84% expressing a desire for additional information. This high level of interest reflects a positive attitude toward health education and indicates that many individuals recognize the importance of preventing diabetes and reducing associated health risks.

The willingness to receive more information suggests that respondents are motivated to improve their understanding of diabetes, adopt healthier lifestyles, and make informed decisions regarding disease prevention. This finding presents an excellent opportunity for healthcare organizations, educational institutions, and public health authorities to implement targeted awareness programs and educational interventions .The remaining 16% who were not interested in receiving additional information may believe they already possess sufficient knowledge, may not perceive themselves to be at risk, or may have limited interest in health-related topics.

Overall, the high demand for further information highlights the need for continuous educational efforts, community awareness campaigns, digital health resources, and preventive health programs. Enhancing public knowledge about diabetes risk factors, symptoms, screening methods, and preventive strategies could contribute significantly to reducing the future burden of diabetes within the community.

4. Conclusion

Diabetes mellitus is a major and rapidly growing public health concern that significantly affects the health and quality of life of individuals worldwide, particularly among young and middle-aged adults. The present study was conducted to assess the level of awareness, knowledge of risk factors and symptoms, lifestyle practices, screening behaviors, preventive measures, and attitudes toward diabetes education among the study population. By focusing on adults from diverse demographic backgrounds, this survey sought to evaluate current understanding of diabetes mellitus and identify gaps in knowledge and preventive practices that may contribute to the increasing burden of the disease. The findings indicate that although a considerable proportion of respondents were aware of diabetes mellitus and its potential health consequences, important deficiencies remained in terms of preventive behaviors and lifestyle modifications. While many participants recognized common risk factors such as obesity, unhealthy dietary habits, physical inactivity, and family history, fewer individuals consistently adopted healthy behaviors, including regular exercise, balanced nutrition, routine blood glucose monitoring, and weight management. This disparity between awareness and practice highlights the challenges associated with translating knowledge into effective disease prevention. Several behavioral and lifestyle-related factors were identified as potential contributors to the risk of developing diabetes mellitus. Sedentary lifestyles, frequent consumption of high-calorie and processed foods, inadequate physical activity, and limited participation in regular health screening programs were commonly observed among respondents. Furthermore, younger adults and urban residents appeared to be at greater risk due to modern lifestyle patterns characterized by reduced physical activity, increased stress, and unhealthy dietary choices.

These findings emphasize the need for targeted public health interventions aimed at improving diabetes awareness and promoting healthier lifestyles. Educational campaigns through newspapers, television, digital media, and social networking platforms can play a crucial role in disseminating accurate information regarding diabetes prevention, risk factors, early symptoms, and the importance of regular health checkups. Additionally, organizing seminars, workshops, and awareness programs in educational institutions, workplaces, and community settings may encourage individuals to adopt healthier behaviors and seek timely medical advice.

In conclusion, diabetes mellitus continues to pose a significant public health challenge that requires comprehensive preventive strategies. Strengthening health education, promoting healthy dietary and physical activity habits, encouraging regular screening, and improving access to healthcare services are essential for reducing the burden of diabetes. Through coordinated efforts involving healthcare professionals, educational institutions, policymakers, and communities, the incidence and complications of diabetes mellitus can be effectively minimized, leading to improved individual well-being and better public health outcomes.

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