Diabetes in the Digital Age: A Survey based Analysis and Future Innovations in Management of associated Complications

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Abstract:

Diabetes mellitus is a chronic disease characterized by high blood sugar levels due to insulin deficiency or resistance. With the increasing prevalence of diabetes globally, it is critical to assess the level of awareness about this condition among adults to inform public health strategies and educational interventions. This study aims to explore the knowledge and awareness of diabetes among adults, focusing on symptoms, risk factors, complications, and management practices. . The survey, conducted using a Google Form, gathered responses from a diverse sample of participants. Key findings reveal that a significant majority (73.7%) of respondents were female, with 50.6% aged between 20-35 years. Most respondents (76.4%) were students, and 89.5% had some knowledge about diabetes. However, there was a notable gap in understanding effective diabetes management, with only 70.9% aware of proper management practices. The study also highlights the prevalence of lifestyle factors, such as physical activity levels and sugar consumption, that influence diabetes outcomes.

Additionally, 57.9% of respondents reported a family history of diabetes, and 42.1% used insulin as a management strategy. Future recommendations include implementing sugar taxes, expanding access to healthy food options, and increasing funding for diabetes research and prevention programs. These findings underscore the need for targeted interventions, improved education, and policy changes to better manage diabetes and reduce its impact on affected individuals. Increased awareness can potentially lead to earlier diagnoses, improved preventive measures, and better support for patients and their families. This comprehensive approach sheds light on the challenges of diabetes and the importance of awareness in mitigating its impact.

Key words:

LADA: Latent Autoimmune Diabetes in Adults, **MODY:** Maturity onset Diabetes of the young, **NH:**Neonatal hemochromatosis, **HbA1C:** Test of diabetes hemoglobin A1C, **CGM:** Continuous Glucose Monitor, **OGGT:**Oxoguanine glycosylase,

1. Introduction

1.1. Diabetes:

Glucose (sugar) mainly comes from carbohydrates in your food and drinks. It's your body's go-to source of energy. Your blood carries glucose to all your body's cells to use for energy.

When glucose is in your bloodstream, it needs help — a "key" — to reach its destination. This key is insulin (a hormone). If your pancreas isn't making enough insulin or your body isn't using it properly, glucose builds up in your bloodstream, causing high blood sugar (hyperglycemia) (Rahman et al., 2023).

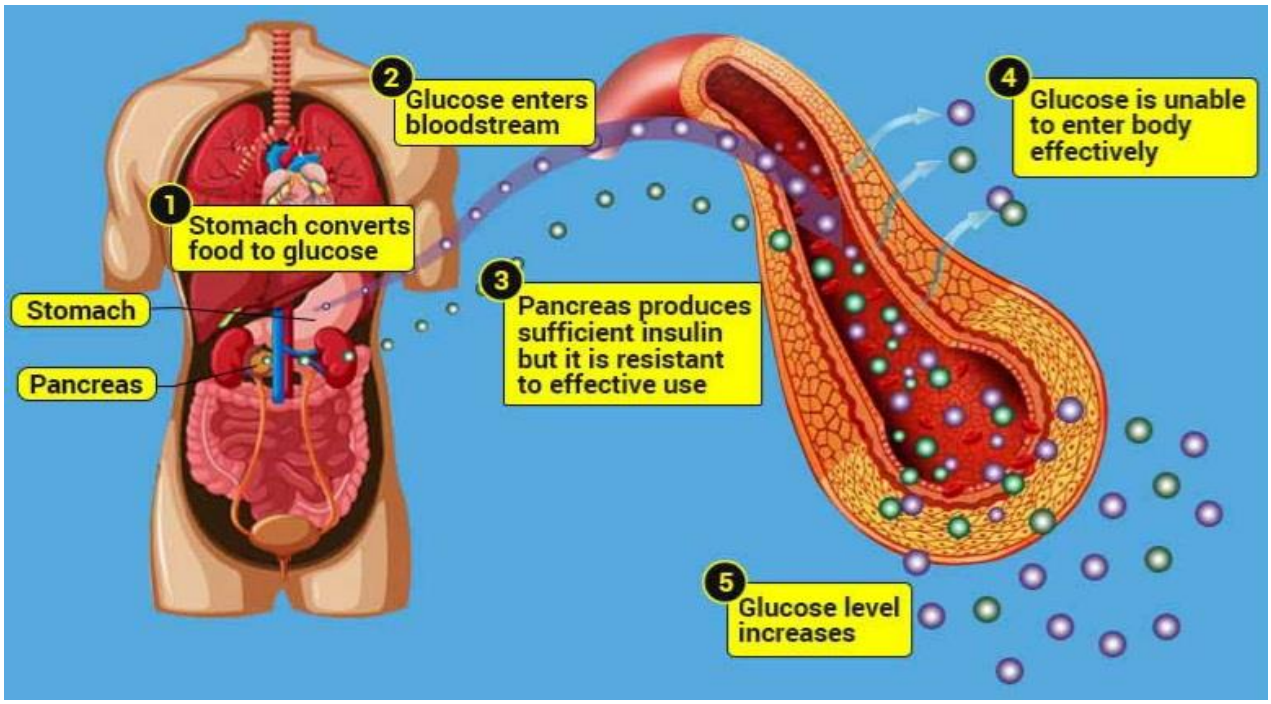

Figure 1.1: Pathway of diabetes

1.2. TYPES OF DIABETES:

There are several types of diabetes. The most common forms include:

1.2.1. Prediabetes:

This type is the stage before Type 2 diabetes. Your blood glucose levels are higher than normal but not high enough to be officially diagnosed with Type 2 diabtets (Echouffo-Tcheugui & Selvin, 2021).

1.2.2. Type 2 diabetes:

With this type, your body doesn't make enough insulin and/or your body's cells don't respond normally to the insulin (insulin resistance). This is the most common type of diabees. It mainly affects adults, but children can have it as well (Shah & Vella, 2014).

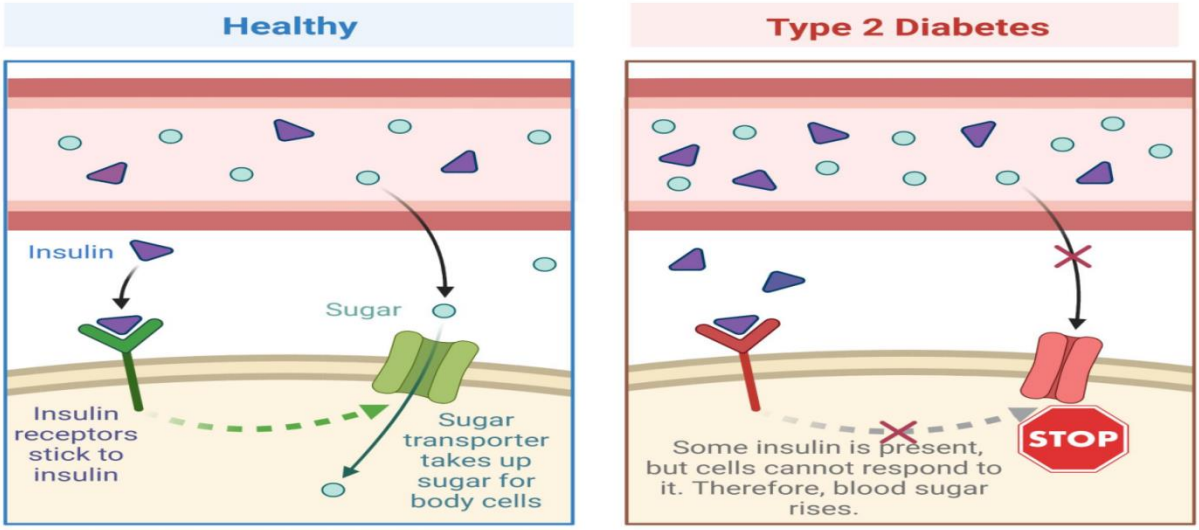

Figure 1.2: comparison of healthy cells and diabetic cells

1.2.3. Type 1 diabetes:

This type is an autoimmune disease in which your immune system attacks and destroys insulin-producing cells in your pancreas for unknown reasons. Up to 10% of people who have diabetes have Type 1. It's usually diagnosed in children and young adults, but it can develop at any age (Katsarou et al., 2017).

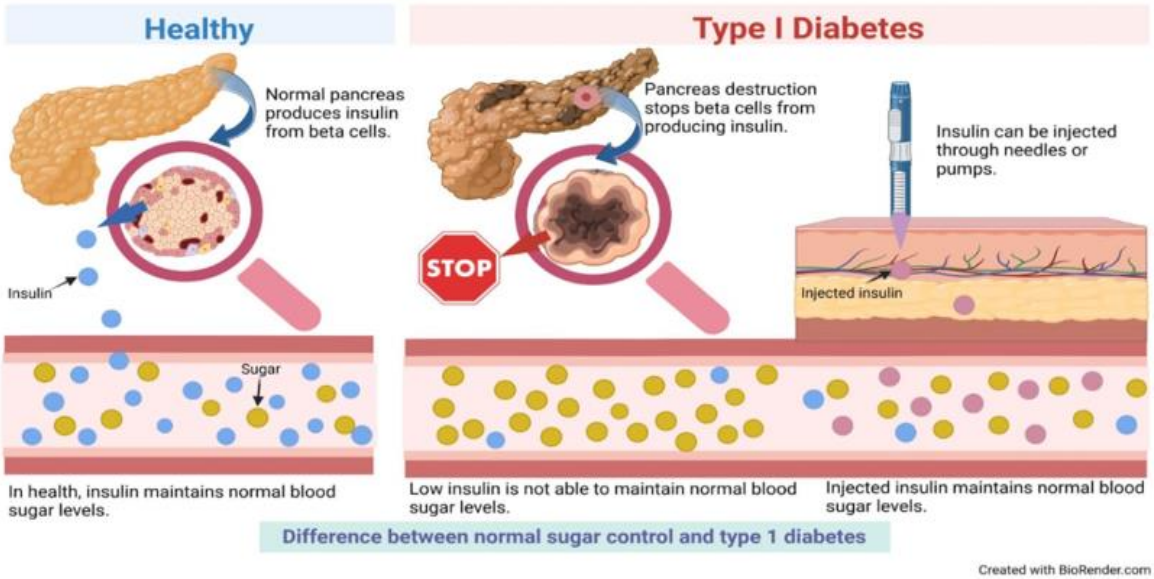

Fig 1.3: Type-1 diabetes

1.2.4. Gestational diabetes:

This type develops in some people during pregnancy. Gestational diabetes usually goes away after pregnancy. However, if you have gestational diabetes, you're at a higher risk of developing Type 2 diabetes later in life (McIntyre et al., 2019).

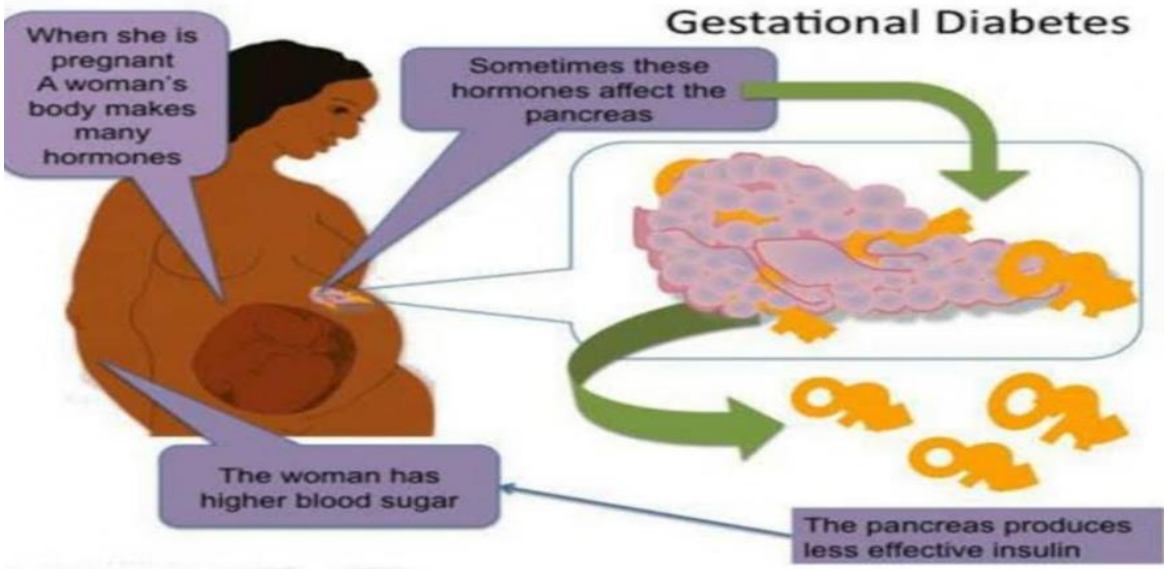

Figure 1.4: Gestational diabetes

1.2.5. Other types of diabetes:

1.2.5.1. Type 3c diabetes:

This form of diabetes happens when your pancreas experiences damage (other than autoimmune damage), which affects its ability to produce insulin. Pancreatitis, pancreatic cancer, cystic fibrosis and hemochromatosis can all lead to pancreas damage that causes diabetes. Having your pancreas removed (pancreatectomy) also results in Type 3c (Gudipaty & Rickels, 2015).

1.2.5.2. Latent autoimmune diabetes in adults (LADA):

Like Type 1 diabetes, LADA also results from an autoimmune reaction, but it develops much more slowly than Type 1. People diagnosed with LADA are usually over the age of 30 (Jones et al., 2021).

1.2.5.3. Maturity-onset diabetes of the young (MODY):

MODY, also called monogenic diabetes, happens due to an inherited genetic mutation that affects how your body makes and uses insulin. There are currently over 10 different types of MODY. It affects up to 5% of people with diabetes and commonly runs in families (Kavvoura & Owen, 2019).

1.2.5.4. Neonatal diabetes:

This is a rare form of diabetes that occurs within the first six months of life. It's also a form of monogenic diabetes. About 50% of babies with neonatal diabetes have the lifelong form called permanent neonatal diabetes mellitus. For the other half, the condition disappears within a few months from onset, but it can come back later in life. This is called transient neonatal diabetes (Beltrand et al., 2020).

1.2.5.5. Brittle diabetes:

Brittle diabetes is a form of Type 1 diabetes that's marked by frequent and severe episodes of high and low blood sugar levels. This instability often leads to hospitalization. In rare cases, a pancreas transplant may be necessary to permanently treat brittle diabetes mellitus (Amiel, 1991).

1.3. Pathophysiology:

Diabetes mellitus is a syndrome with disordered metabolism and inappropriate hyperglycemia due to either a deficiency of insulin secretion or to a combination of insulin resistance and inadequate insulin secretion to compensate Normal Pathology of the Human Bod (Banday et al., 2020).

In people that are healthy, the pancreas, an organ located behind the liver and stomach, secretes digestive enzymes and the hormones insulin and glucagon into the bloodstream to control the amount of glucose in the body. The release of insulin into the blood lowers the level of blood glucose (simple sugars from food) by allowing glucose to enter the body cells, where it is metabolized. If blood glucose levels get too low, the pancreas secretes glucagon to stimulate the release of glucose from the liver. Right after a meal, glucose and amino acids are absorbed directly into the bloodstream, and blood glucose levels rise sharply. The rise in blood glucose levels signals important cells in the pancreas, called beta cells, to secrete insulin, which pours into the bloodstream. Within 20 minutes after a

meal insulin rises to its peak level. Here, insulin and other hormones direct whether glucose will be burned for energy or stored for future use. When insulin levels are high, the liver stops producing glucose and stores it in other forms until the body needs it again (Badoiu et al., 2021).

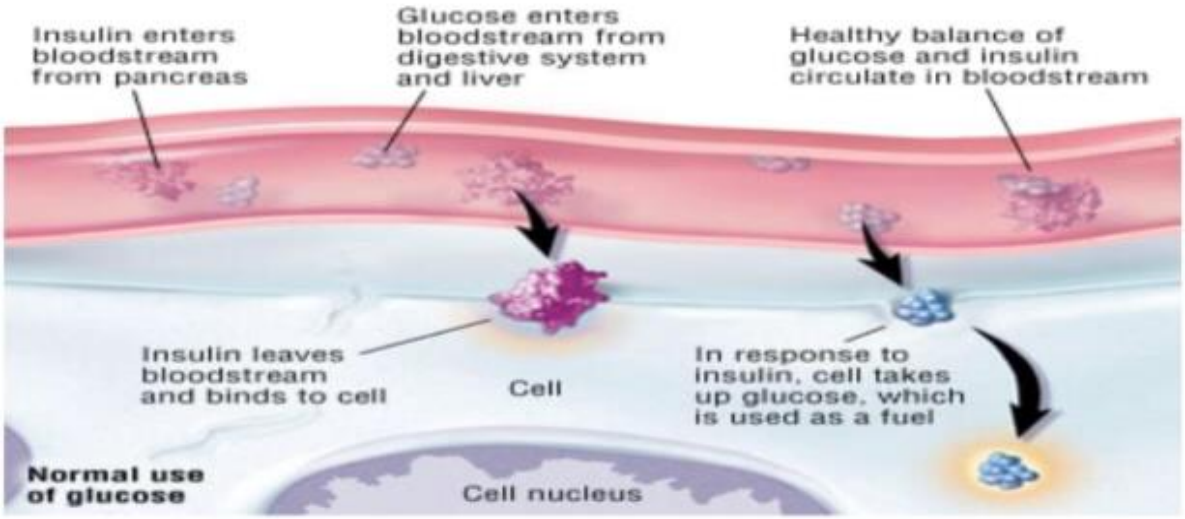

Figure 1.5: Pathophysiology of diabetes

1.3.1. Type 1 Diabetes:

Type 1 diabetes is usually diagnosed in children and young adults. It develops when the body's immune system destroys pancreatic beta cells, the only cells in the body that make the hormone insulin, which regulates blood glucose. Only 5% of people with diabetes have this form of the disease. To survive, people with type 1 diabetes must have insulin delivered by injection or a pump (Szablewski, 2014).

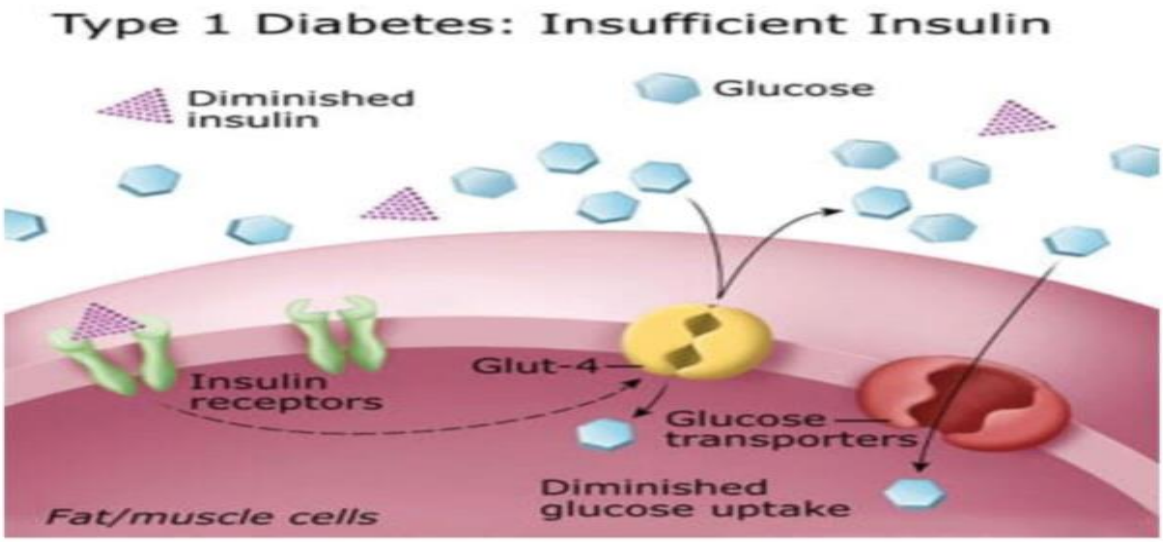

Figure 1.6: Pathophysiology of diabetes

1.3.2. Type 2 Diabetes:

Type 2 diabetes is the most common form of diabetes. The causes of type 2 diabetes are multi-factorial and include both genetic and environmental elements that affect beta-cell function and tissue (muscle, liver, adipose tissue, and pancreas) insulin sensitivity (Scheen, 2003). In type 2 diabetes, either the body does not produce enough insulin, or the cells ignore the insulin. It usually begins as insulin resistance, a disorder in which the cells do not use insulin properly. As the need for insulin rises, the pancreas gradually loses its ability to produce it. When glucose builds up in the blood instead of going into cells, it can cause far-reaching health implications like heart disease, nerve damage and kidney damage. Diabetes is the leading cause of kidney failure, non-traumatic lower- limb amputations, and new cases of blindness among adults in the United States (Gilhotra et al., 2016). You can prevent or delay the onset of type 2 diabetes through a healthy lifestyle such as changing your diet, increasing your level of physical activity, maintaining a healthy weight... with these positive steps, you can stay healthier longer and reduce your risk of diabetes.

1.4. Symptoms of Diabetes:

Following are the common symptoms of diabetes including increased thirst and urination, increased hunger, fatigue, blurred vision, numbness or tingling in the feet or hands, sores that do not heal and unexplained weight loss.

Symptoms of type 1 diabetes can start quickly, in a matter of weeks. Symptoms of type 2 diabetes often develop slowly—over the course of several years—and can be so mild that you might not even notice them. Many people with type 2 diabetes have no symptoms. Some people do not find out they have the disease until they have diabetes-related health problems, such as blurred vision or **heart trouble** (Clark et al., 2007).

1.5. Causes:

1.5.1. Type 1 Diabetes:

It occurs when your immune system, the body's system for fighting infection, attacks and destroys the **insulin**-producing beta cells of the **pancreas**It occurs when your immune system, the body's system for fighting infection, attacks and destroys the **insulin**-producing beta cells of the **pancreas**. Scientists think type 1 diabetes is caused by **genes** and environmental factors, such as viruses, that might trigger the disease. Studies such as **TrialNet External** link are working to pinpoint causes of type 1 diabetes and possible ways to prevent or slow the disease (Skyler et al., 2008).

1.5.2. Type 2 diabetes:

The most common form of diabetes—is caused by several factors, including lifestyle factors and genes.

1.5.3. Effects of Overweight, obesity, and physical inactivity:

You are more likely to develop type 2 diabetes if you are not physically active and are **overweight** or have **obesity**. Extra weight sometimes causes **insulin resistance** and is common in people with type 2 diabetes. The location of body fat also makes a difference. Extra belly fat is linked to insulin resistance, type 2 diabetes, and **heart and blood vessel disease**. To see if your weight puts you at risk for type 2 diabetes, check out these Body Mass Index (BMI) charts (Venables & Jeukendrup, 2009).

1.5.4. Insulin resistance:

Type 2 diabetes usually begins with **insulin resistance**, a condition in which muscle, liver, and fat cells do not use insulin well. As a result, your body needs more insulin to help glucose enter cells. First, the pancreas makes more insulin to keep up with the added demand. Over time, the pancreas can't make enough insulin, and blood glucose levels rise (Taylor et al., 1994).

1.5.5. Gestational diabetes:

Scientists believe gestational diabetes, a type of diabetes that develops during pregnancy, is caused by the hormonal changes of pregnancy along with genetic and lifestyle factors.

1.5.6. Insulin resistance:

Hormones produced by the placenta NIH external link contribute to insulin resistance, which occurs in all women during late pregnancy. Most pregnant women can produce enough insulin to overcome insulin resistance, but some cannot. Gestational diabetes occurs when the pancreas can't make enough insulin. As with type 2 diabetes, extra weight is linked to gestational diabetes. Women who are overweight or have obesity may already have insulin resistance when they become pregnant. Gaining too much weight during pregnancy may also be a factor (Rahman et al., 2023).

1.5.7. Genes and family history:

Having a family history of diabetes makes it more likely that a woman will develop gestational diabetes, which suggests that genes play a role. Genes may also explain why the disorder occurs more often in African Americans, American Indians, Asians, and Hispanics/Latinas.

1.5.8. Other cause:

Genetic mutations NIH external link, other diseases, damage to the pancreas, and certain medicines may also cause diabetes.

1.5.9. Genetic mutations:

Monogenic diabetes is caused by mutations, or changes, in a single gene. These changes are usually passed through families, but sometimes the gene mutation happens on its own. Most of these gene mutations cause diabetes by making the pancreas less able to make

insulin. The most common types of monogenic diabetes are **neonatal diabetes** and **maturity-onset diabetes of the young (MODY)**. Neonatal diabetes occurs in the first 6 months of life. Doctors usually diagnose MODY during adolescence or early adulthood, but sometimes the disease is not diagnosed until later in life. Cystic fibrosis NIH external link produces thick mucus that causes scarring in the pancreas. This scarring can prevent the pancreas from getting enough insulin. Hemochromatosis causes the body to store too much iron. If the disease is not treated, iron can build up in and damage the pancreas and other organs (Støy et al., 2007).

1.5.10. Hormonal diseases:

Some hormonal diseases cause the body to produce too much of certain hormones, which sometimes cause insulin resistance and diabetes.

Cushing's syndrome occurs when the body produces too much cortisol—often called the "stress hormone." **Acromegaly** occurs when the body produces too much growth hormone. **Hyperthyroidism** occurs when the thyroid gland produces too much thyroid hormone. Pancreatitis, pancreatic cancer, and trauma can all harm the beta cells or make them less able to produce insulin, resulting in diabetes. If the damaged pancreas is removed, diabetes will occur due to the loss of the beta cells (Biondi et al., 2019).

1.5.11. Harmful Medicines:

Sometimes certain medicines can **Harm beta cells** or disrupt the way insulin works. These including niacin (a type of vitamin B3, certain types of diuretics also called water pills) anti-seizure drugs, psychiatric drugs (drugs to treat human immunodeficiency virus , pentamidine, a drug used to treat a type of pneumonia External link, glucocorticoids—medicines used to treat inflammatory illnesses such as rheumatoid arthritis NIH external link, asthma NIH external link, lupus NIH external link, and ulcerative colitis, anti-rejection medicines (used to help stop the body from rejecting a transplanted organ).

1.6. Diagnosis of Diabetes:

Healthcare providers diagnose diabetes by checking your glucose level in blood test. Three tests cam measure your blood glucose level:

1.6.1. Fasting blood glucose test:

For this test, you don't eat or drink anything except water for at least eight hours before test. As food can greatly affect blood sugar, this test allows your provider to see your baseline blood sugar (Zhang et al., 2019).

1.6.1.2. Random blood glucose test:

''Random'' means that you can get this test at any time, regardless of if you've fasted (Bowen et al., 2015).

1.6.1.2.1. HbA1c:

This test, also called HbA1C or glycated haemoglobin test, provides your average blood glucose level over the past two or three months.

To screen for and diagnose gestational diabetes, providers order an oral glucose tolerance test. The following test results typically indicate if you don't have diabetes, have prediabetes or have diabetes. These values may vary slightly. In addition, healthcare providers rely on more or than one test to diagnose diabetes (Sherwani et al., 2016).

Table 1.1: Tests For Diabetes

Tests	Fasting blood glucose test	Random blood glucose test	A1c
In range (mg/ dl)	Less than 100	N/A	Less than 5.7 %
Prediabetes(mg/dl)	100 - 125	N/A	5.7 % - 6.4%
Diabetes(mg/dl)	Above 126	200 or higher (with classic symptoms of hyperglycemia or hyperglycemic crisis)	6.5 % or higher

1.7. Management and treatment of diabetes:

Diabetes is a complex condition, so its management involves several strategies. In addition, diabetes affects everyone differently, so management plans are highly individualized. The four main aspects of managing diabetes include:

1.7.1. Blood sugar monitoring:

Monitoring your blood sugar (glucose) is key to determining how well your current treatment plan is working. It gives you information on how to manage your diabetes on a daily — and sometimes even hourly — basis. You can monitor your levels with frequent checks with a glucose meter and finger stick and/or with a Continuous glucose monitor (CGM). You and your healthcare provider will determine the best blood sugar range for you (Rahman et al., 2023).

1.7.2. Oral diabetes medications:

Oral diabetes medications (taken by mouth) help manage blood sugar levels in people who have diabetes but still produce some insulin — mainly people with Type 2 diabetes and prediabetes. People with gestational diabetes may also need oral medication. There are several different types. **Metformin** is the most common (Rahman et al., 2023).

1.7.3. Insulin:

People with Type 1 diabetes need to inject synthetic insulin to live and manage diabetes. Some people with Type 2 diabetes also require insulin. There are several different types of synthetic insulin. They each start to work at different speeds and last in your body for different lengths of time. The four main ways you can take insulin include injectable insulin with a syringe (shot), insulin pens, insulin pumps and rapid acting inhaler insulin (Rahman et al., 2023).

1.7.4. Diet:

Meal planning and choosing a healthy diet for you are key aspects of diabetes management, as food greatly impacts blood sugar. If you take insulin, counting carbs in the food and drinks you consume is a large part of management. The amount of carbs you eat determines how much insulin you need at meals. Healthy eating habits can also help you manage your weight and reduce your heart disease risk (Rahman et al., 2023).

1.7.5. Exercise:

Physical activity increases insulin sensitivity (and helps reduce insulin resistance) so, exercise is an important part of management for all people with diabetes. Due to increased risk of heart disease, it is also important to maintain weight, blood pressure, cholesterol (Rahman et al., 2023).

DRUG CLASS	MECHANISM OF ACTION	EFFECT ON PLASMA INSULIN	RISK OF HYPO-GLYCEMIA	COMMENTS
Sulfonylureas *Glimepiride* *Glipizide* *Glyburide*	Stimulates insulin secretion	↑	Yes	Well-established history of effectiveness. Weight gain can occur. Hypoglycemia most common with this class of oral agents.
Glinides *Nateglinide* *Repaglinide*	Stimulates insulin secretion	↑	Yes (rarely)	Taken with meals. Short action with less hypoglycemia. Postprandial effect.
Biguanides *Metformin*	Decreases hepatic production of glucose	↓	No	Preferred agent for type 2 diabetes. Well-established history of effectiveness. Weight loss may occur. Monitor renal function.
Thiazolidinediones (glitazones) *Pioglitazone* *Rosiglitazone*	Binds to peroxisome proliferator–activated receptor-γ in muscle, fat and liver to decrease insulin resistance	↓↓	No	Effective in highly insulin-resistant patients. Once-daily dosing for *pioglitazone*. Check liver function before initiation. Avoid in liver disease or heart failure.
α-Glucosidase inhibitors *Acarbose* *Miglitol*	Decreases glucose absorption	↔	No	Taken with meals. Adverse gastro-intestinal effects.
DPP-4 inhibitors *Alogliptin* *Linagliptin* *Sitagliptin* *Saxagliptin*	Increases glucose-dependent insulin release; decreases secretion of glucagon	↑	No	Once-daily dosing. May be taken with or without food. Well tolerated. Risk of pancreatitis.
Incretin mimetics *Exenatide* *Liraglutide*	Increases glucose-dependent insulin release; decreases secretion of glucagon; slows gastric emptying; increases satiety	↑	No	Injection formulation. *Exenatide* should be injected twice daily within 60 minutes prior to morning and evening meals. Extended-release *exenatide* is given once weekly. *Liraglutide* is dosed once-daily without regard to meals. Weight loss may occur. Risk of pancreatitis.
SGLT2 inhibitors *Canagliflozin* *Dapaglifozin*	Increases urinary glucose excretion	↔	No	Once-daily dosing in the morning. Risk of hypotension, hyperkalemia. Avoid in severe renal impairment.

Figure 1.7: Summary Of Oral Agents Used to Treat Diabetes

1.8. Prevention:

You can't prevent autoimmune and genetic forms of diabetes. But there are some steps you can take to lower your risk for developing prediabetes, Type 2 diabetes and gestational diabetes, including eat a healthy diet, such as the **Mediterranean** diet, get physically active, aim for 30 minutes a day at least five days a week, work to achieve a weight that's healthy for you, manage stress, limit alcohol intake, get adequate sleep (typically 7-9 hours) and seek treatment for sleep disorders, quit smoking, take medications as directed by your healthcare professionals to manage existing risk factors for heart disease (Rahman et al., 2023).

Figure 1.8: Prevention Of Diabetes

2. Literature review

Min-Zhi Li, Li Su, and others conducted a search on prevalence, awareness, treatment, and control of diabetes mellitus in mainland China. Fifty-six eligible studies were included. Increasing trends in the prevalence, treatment, and control of diabetes in mainland China from 1979 to 2012 were observed. The pooled prevalence, awareness, treatment, and control of diabetes mellitus were 6.41%, 45.81%, 42.54%, and 20.87%, respectively. A higher prevalence of diabetes mellitus was found in urban (7.48%, 95%CI = 5.45~9.50) than rural (6.53%, 95%CI = 4.30~8.76) areas. Furthermore, an increasing chronological tendency was

shown in different subgroups of age regarding the prevalence of diabetes. A higher awareness of DM was found in urban (44.25%, 95%CI = 32.60~55.90) than rural (34.27%, 95%CI = 21.00~47.54) populations, and no significant differences were found in the treatment, and control of diabetes among the subgroups stratified by gender and location. From 1979 to 2012, the prevalence, treatment, and control of diabetes mellitus increased; nevertheless, there was no obvious improvement in the awareness of diabetes (Li et al., 2013).

Roglic and Gojka and others describe their study on "WHO Global report on diabetes". The study suggests that Diabetes, acknowledged since ancient times as a grave ailment, appears to have been relatively uncommon among medical practitioners or traditional healers. However, in recent decades, its prevalence has surged, significantly impacting human health and development. The Political Declaration on the Prevention and Control of Noncommunicable Diseases (NCDs) at the UN High-level Political Meeting in 2011 pinpointed diabetes, alongside cardiovascular disease, cancer, and chronic respiratory disease, as focal points for intervention. Subsequently, in 2013, WHO member states endorsed a global monitoring framework for noncommunicable diseases, outlining nine targets to achieve by 2025. These targets, encompassing reductions in exposure to unhealthy diet and physical inactivity, stabilization of diabetes prevalence, enhanced treatment accessibility, and decreased premature mortality, strongly emphasize diabetes and its primary risk factors (Roglic, 2016).

Abdulfatai B. Olokoba, Olusegun A. Obateru and others conducted a study on "Type 2 Diabetes Mellitus: A Review of Current Trends". The research shows that Type 2 diabetes mellitus (DM) is a chronic metabolic disorder in which prevalence has been increasing steadily all over the world. It is estimated that 366 million people had DM in 2011; by 2030 this would have risen to 552 million. It is estimated that 439 million people would have type 2 DM by the year 2030.Type 2 DM is primarily due to lifestyle factors. Several lifestyle factors are known to be important to the development of type 2 DM. Obesity has been found to contribute to approximately 55% of cases of type 2 DM. Recent research into the pathophysiology of type 2 DM has led to the introduction of new medications like glucagon-like peptide 1 analogues: dipeptidyl peptidase-IV inhibitors, inhibitors of the sodium-glucose cotransporter 2 (Olokoba et al., 2012).

4. Material and Methodology

4.1. Introduction:

In this chapter we discuss about the research methods including (Type of research, Population, Sample Size, Sampling Scheme, Research Design, Data Collection Tool, Description of Data Collection Tool, Data Analysis, Software, Limitations of Study), and apply the descriptive statistics, multivariate analysis of variances and correlation tests.

4.2. Population:

In this study we want to study regarding awareness of diabetes among adults Gujrat cities. My population was Gujrat City but due to shortage of time I took perception about diagnosis and treatment strategies of diabetes from University of Chenab. My target population is University of Chenab and my sampled population, from where I take samples it is University of Chenab.

4.3. Sample size:

We took 251 samples.

4.4. Sampling scheme:

In my study, Simple Random sampling technique was applied. Because I have University of Chenab as population then I take 251 samples as Simple random sampling. By this I got data from different departments. For example, Pharmacy, Pharmaceutical, BS English, BDNS, DPT, Radiology.

4.5. Data collection tool:

Data collection tools are helpful for our research because they present pictures of our work and help us to get information, clarify the process and identify the methods. By systematic data collection tools one can get good and accurate results for their research or study. To get more accurate and appropriate results the following data collection tools can be used. We collected the data from different departments of our university and from Gujrat and Gujranwala city through a questionnaire.

Questionnaire:

We conduct a method of questionnaire for collecting the data because it is structured approach. Because of the shortage of time, we were unable to interview 100 people and then collect data. Questions are based in five order Likert scales that have categories of strongly disagreeing, disagree, neutral, agree and strongly agree.

Informed Consent

We are pharmacy students (Syeda Masoomah, Fakhima Sami, Huma Naz, Shifa Amin, Zainab Arif, Hamna Adil) doing pharm-D from University of Chenab (Gujrat). We are conducting a Mini Thesis on the Topic "**Awareness about diabetes among adults.".** The objective of this research is to analyze the Perception about the knowledge of diabetes and awareness among people. It is requested that you are my potential respondent, and we need your valuable information on this topic. We assure you that this collected information will be used only for research purposes and kept confidential. Thanks in advance for your participation.

Section A
Demographic Data

This data pertains to statistical information about the population, including attributes such as age, gender, education level, marital status, occupation and geographic location.

Sr. Question	**Option-A**	**Option-B**	**Option-C**	**Option-D**	**Option-E**
1. Gender	Male	Female	Prefer not to say		
2. Age	Below 20	20-35	35-59	Above 50	
3. Area of residence	Rural	Urban	Town		
4. Weight	Below 40	40-50	50-60	60-70	Above 70
5. Marital status	Married	Unmarried	Widow	Divorced	
6. Job	Government	Private	Own business	Housewife	Student
7. Education level	Matric	Intermediate	Graduation	Master's	
8. Family system	Joint Family	Separate			

Section B
Knowledge Assessment

9.DO YOU KNOW WHAT DIABETES IS?	YES	NO
10. CAN YOU NAME AT LEAST TWO TYPES OF DIABETES?		
11. DO YOU KNOW HOW DIABETES CAN BE MANAGED OR TREATED?	Yes	No
12. APPROPRIATE MEDICATION AND LIFESTYLE MODIFICATIONS SUCH AS REGULAR EXERCISE AND A HEALTHY DIET	True	False

CAN HELP LOWER BLOOD SUGAR LEVEL.		
13. DIABETES IS OFTEN CALLED ''SILENT KILLER'' BECAUSE IT IS ASYMPTOMATIC.	Yes	No

Section C
Diet Habits

14. How is your level of physical activity?	Good	Moderate	Low			
15. Amount of sugar you consume in a day?	High	Medium	Low			
16. Do you know the importance of diabetic treatment?	Yes	No				
17. Do you feel any of these symptoms?	Fatigue	Fainting	Frequent urination	Blurred vision	Slow healing	None of these
18. Have you ever experienced increased thirst with frequent urination?	Yes	No	Maybe			

Section D
Lifestyle Modification

19. Have you ever seen a dietitian?	Yes	Never	Sometimes	
20. Do you exercise regularly?	Yes	No	Sometimes	
21. Do you smoke?	Yes	No		
22. Do you take BP medications?	Yes	No	Sometimes	
23. When do you monitor your glucose level?	Never	Rarely	Sometimes	Always
24. Do you know anyone who has been diagnosed with diabetes?	Yes	No	Maybe	
25. If a person has diabetes, what should	Go to hospital	Do home remedies	None of the above	

he do?

26. Are you a diabetic patient?	Yes	No

Section E
Diabetic Scenario

27. How often do you have low or high blood sugar?	Daily	Rarely	Several times a week	
28. What type of diabetes do you have?	Diabetes Mellitus-1	Diabetes Mellitus-2	Diabetes Insipidus	
29. Do you have a family history of diabetes?	Yes	No		
30. Which medication do you use?	Insulin	Glucophage	Glimepiride	Di micron
31. Do you make your own modifications in dose of drug prescribed?	Yes	No		
32. Do you skip taking medicines?	Yes	No	Maybe	
33. Are you experiencing any complications or side effects from diabetic treatment?				

Section F
Drug Drug interactions

34. Do you face any of this concomitant disease due to diabetes?	Neuropathy	Cardiovascular disease	Loss of vision	Nephropathy	None of above
35. Do you take any of these medicines with combinations?	Metformin+ DPP-4 inhibitors	Metformin+ Sulfonylurea	Metformin+ Thiazolidinediones	None of above	

36. Are you having any side effects from your medication?	Yes	No			
37. If yes, then please describe below.					
38. How do you perceive the impact of your concomitant disease on your diabetes management?	Significantly worsens diabetes control	Moderately affects diabetes control	Minimally affects diabetes control	Does not affect diabetes control	Not sure

6. Results and Discussion

6.1. Respondents Gender:

The below results show that there are 73.7% females who perform this survey.24.7% are males who perform this survey while1.6% were those who prefer not to say their gender. From the selected respondents 50.6% were in between the range of 20-35, 37.1% were below age 20, 7.2% were in between the age range of 35-59 not but not the least 5.1% were above 50 years old. These given results showed that 54.2% belong to urban areas, 29.9% were those respondents who belong to rural areas while 15.9& were those respondents who lived in town. When will talked about the weight factor, which one is major concerned in Diabetes, 35.1% were between the range of 50-60kg, 24.7% were between the range of 40-50kg, 16.3% were between the range of 60-70kg and 15.1% were above 70kg while 3.2% were below 40kg. This indicated that weight can be a factor in diabetes but cannot be a major concern. Out of respondents 79.3% were unmarried, 18.1% were married, 1.7% were widowed and 0.8% were divorced. 76.4% of respondents were students. When accounted on profession basis 9.3% did a private job, 8.9% respondents were housewives, 3% had their own business and 2.5% were government jobs holder. 59.5% of respondents were doing graduation, 23.2% of respondents were intermediate, 9.3% of respondents were in matric and 8% of respondents were doing master. This result depicted that our major population was educated and was clearly aware of about concerned survey. When talked about to check effect of family living style it was 69.2% of respondents lived in separate families and 30.8% were living in joint families.

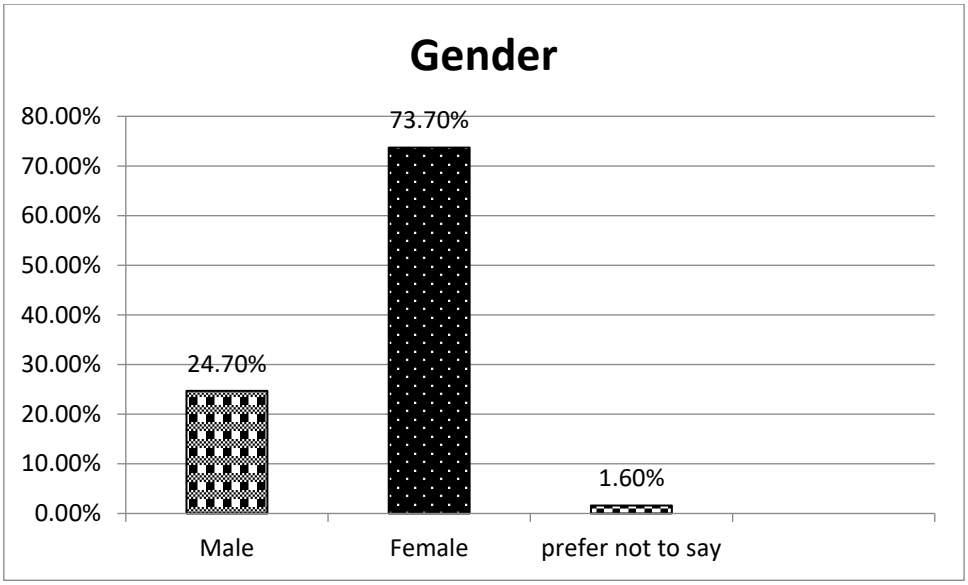

Figure 08: % age respondent on basis of gender

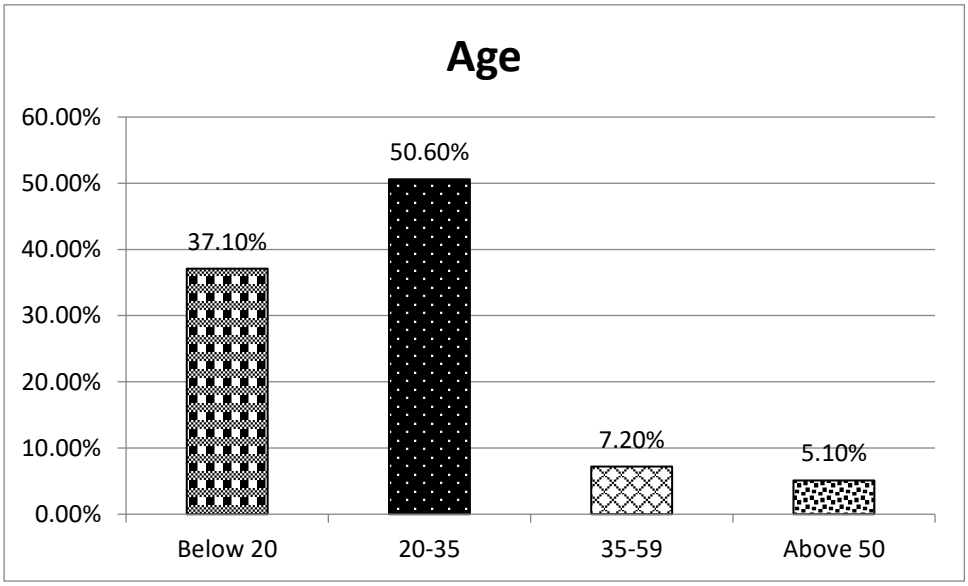

Figure 08: % age respondent on basis of gender

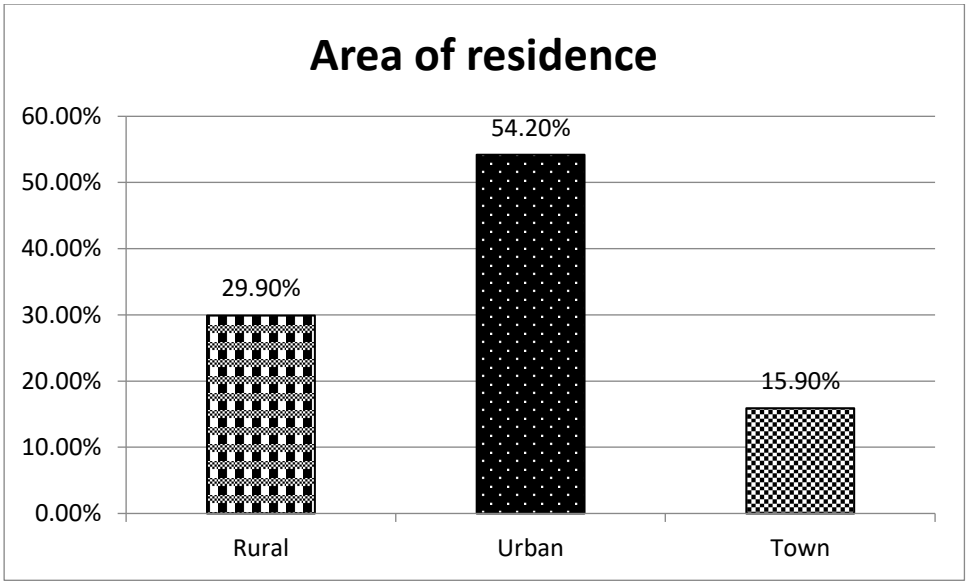

Figure 10: % age respondent on basis of Area of residence

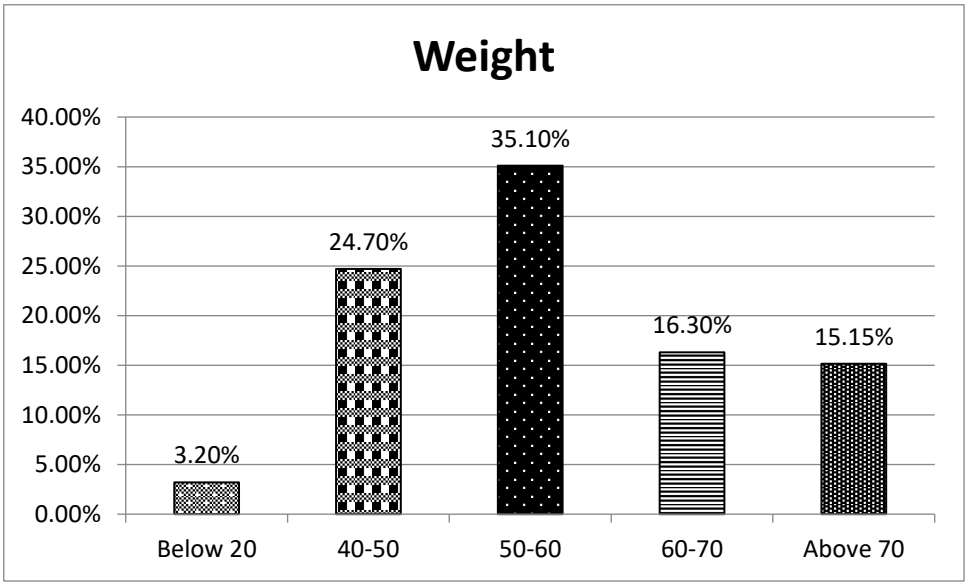

Figure 11: % age respondent on basis of weight

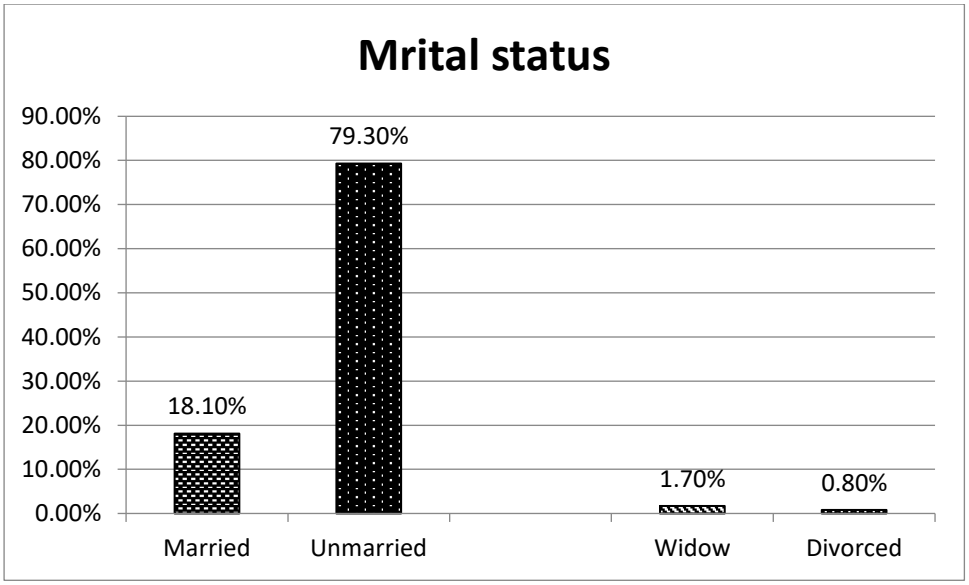

Figure 12: % age respondent on basis of Martial status

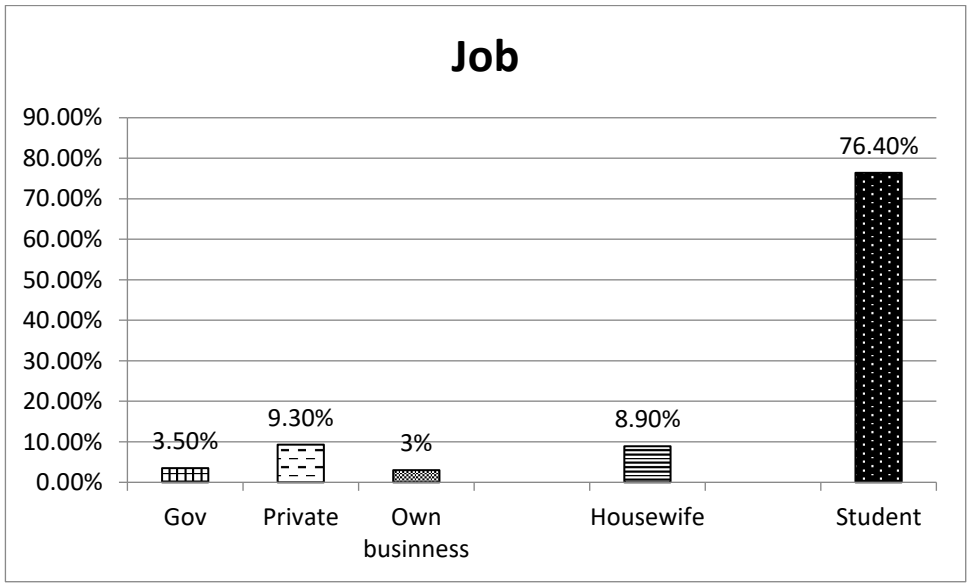

Figure 12: % age respondent on basis of Martial status

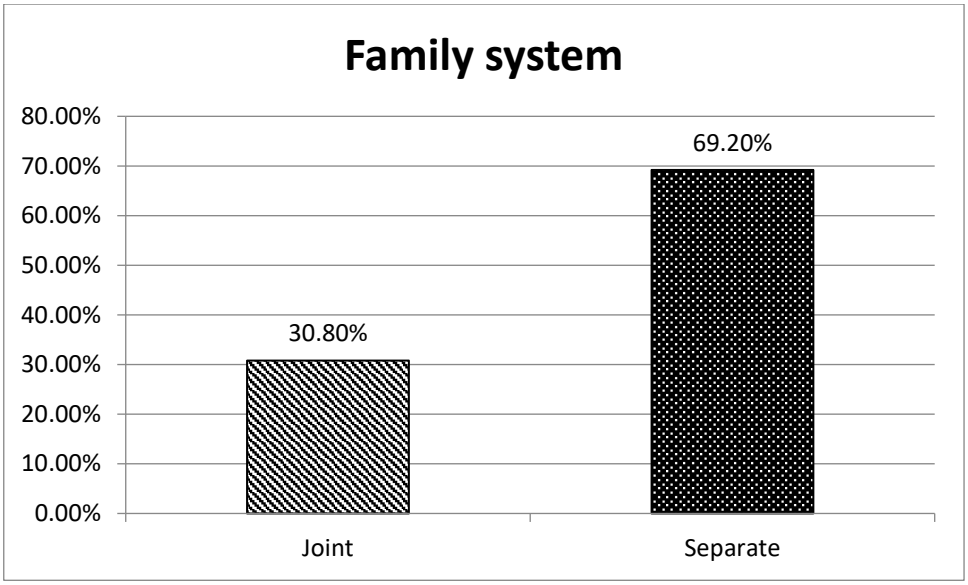

Figure 14: % age respondent on basis of Family system

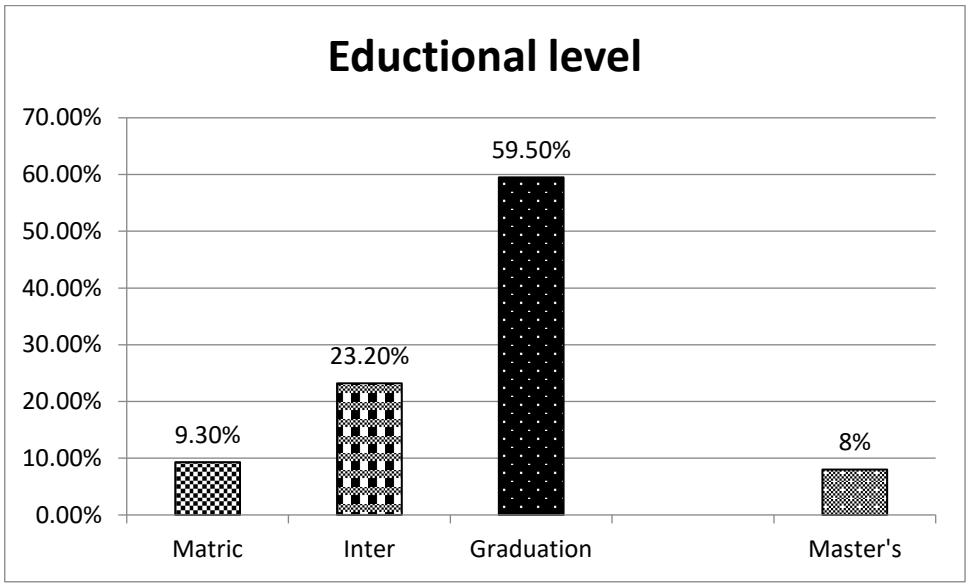

Figure 15: % age respondent on basis of educational level

6.2. Knowledge assessment

89.5% have knowledge about diabetes and 10.5% have no knowledge about diabetes. 70.9% of respondents know that diabetes management and 29.1% don't know about diabetes management. 97% of respondents think that lifestyle modification can help lower blood sugar level. 88.2% of respondents thinks that diabetes is a silent killer while 11.8% disagree with it. 30.7% respondents have a good level of physical activity while 56.6% are those who have

moderate level of physical activity and 12.7% are those who have low level of physical activity. 7.2% of respondents consume high sugar in a day while 62.9% are those who have medium sugar consumption and 29.9% are those who consume low amount of sugar. 28.7% of respondents feel fatigue. 2.15 feels fainting. 6.3% are those who have frequent urination. 8.4% have blurred vision while 3.4% have slow healing and 51.15 do not feel any of these symptoms. 21.5% of respondents have frequent urination with increased thirst. 27% are not sure about it. 51% do not have this issue. 22.35% of respondents are those who visit dieticians while 60.6% are those who never visit and 17.1% are those who visit sometimes. 94.4% respondents are those who don't smoke and 5.6% are those who don't smoke. 47.8% respondents are those who don't do exercise regularly, 14.3 % are those who do exercise regularly and 37.8%. 85.3% respondents don't take BP medications, and 8% respondents take Bp medications. 6.8% respondents sometimes take BP medicines. 20.3% respondents monitor their glucose level rarely. 18.7% respondents sometime and 58.2% respondents have never monitored.2.8% respondents always monitor their glucose level.

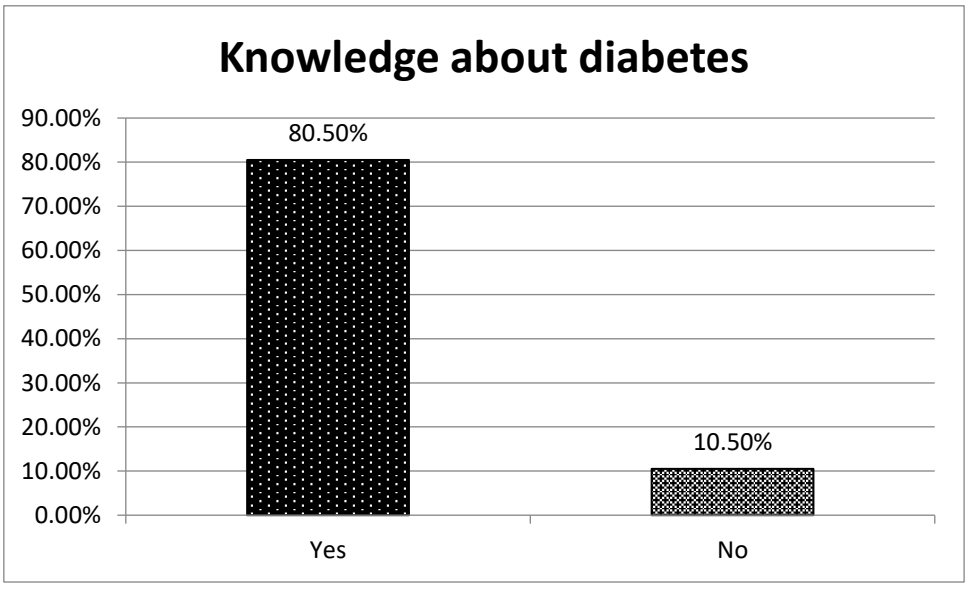

Figure 16: % age respondent on basis of Knowledge about diabetes

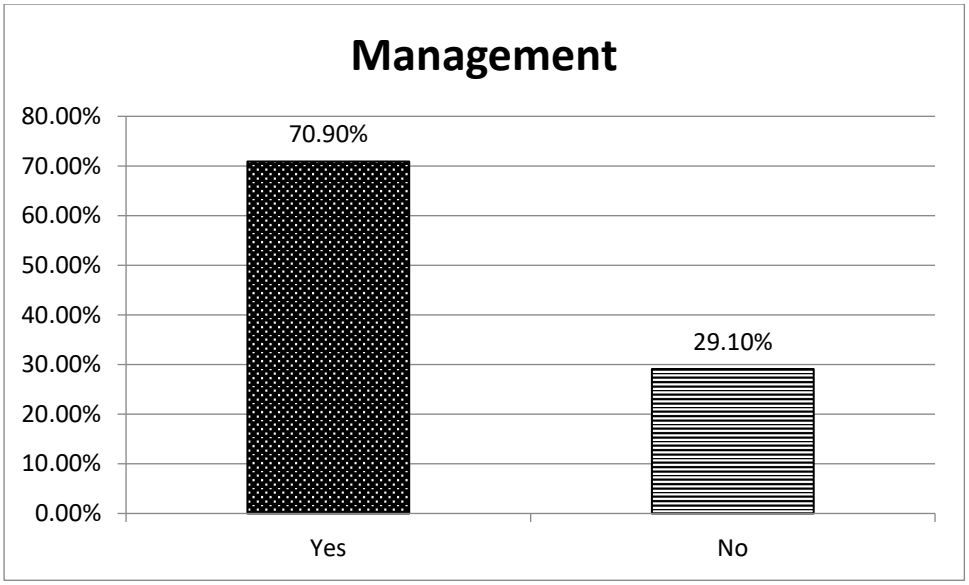

Figure 17: % age respondent on which contains knowledge about Management of Diabetes

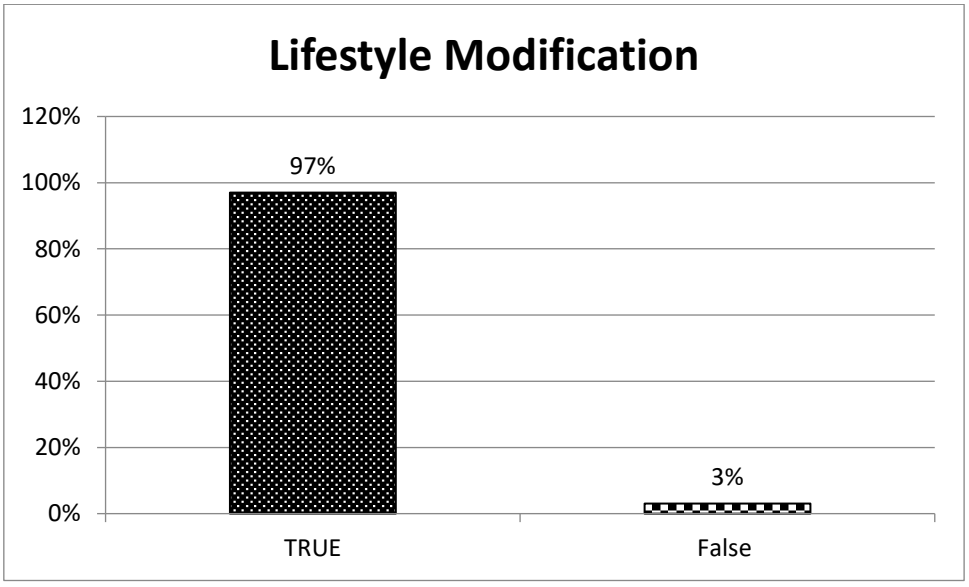

Figure 18: % age of patients who took Lifestyle Modifications

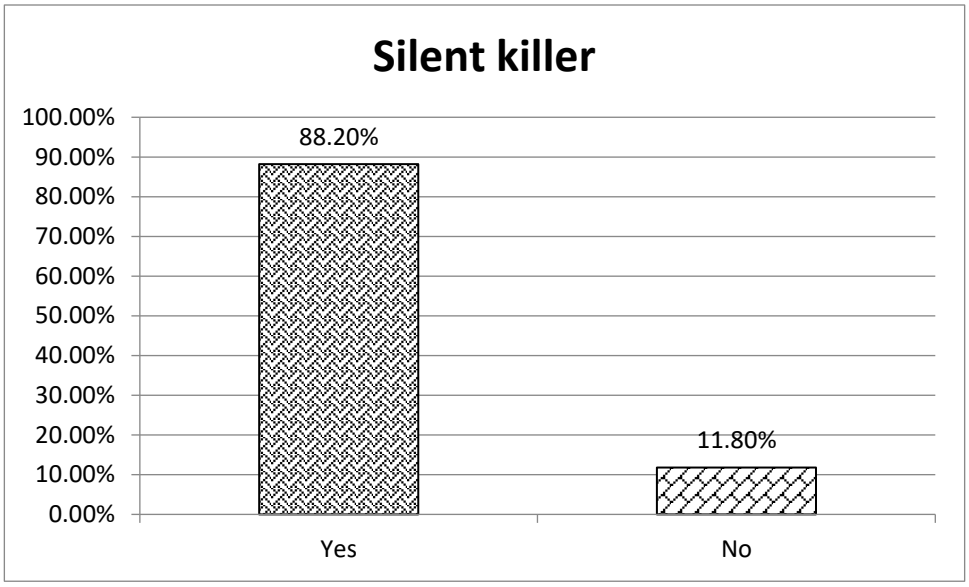

Figure 19: % age respondent which consider it as Silent killer Disease

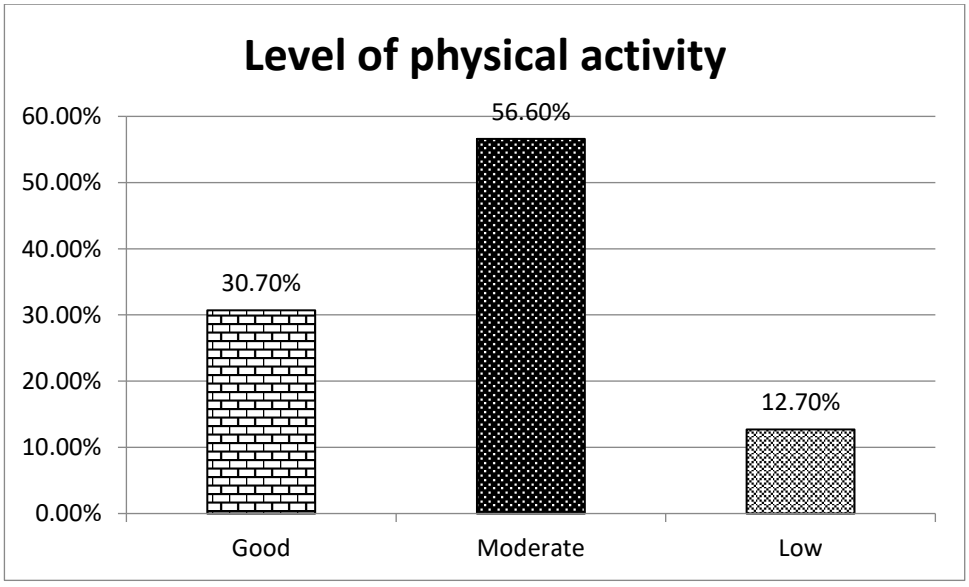

Figure 20: % age of patients who took different Level of Physical Activity to manage Diabetes

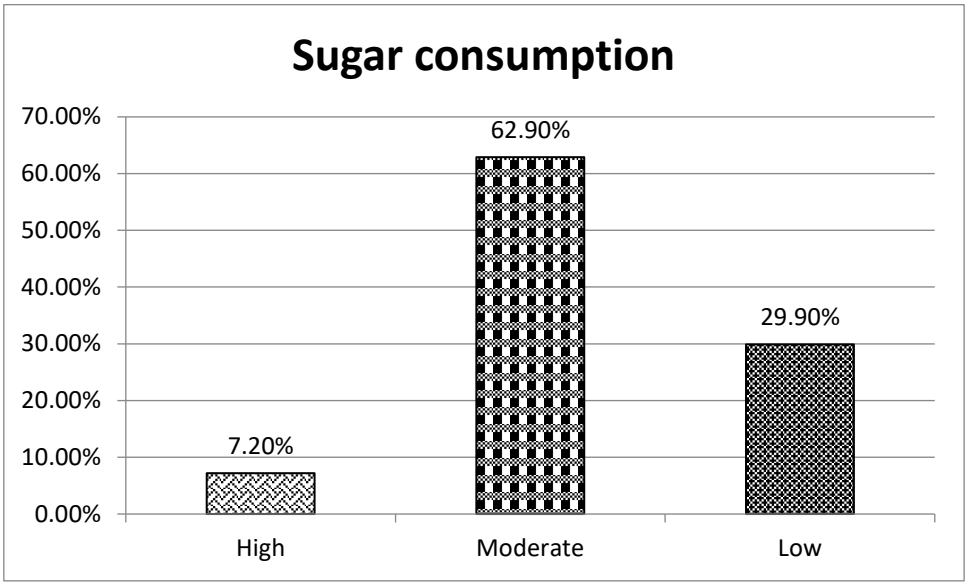

Figure 21: %age Sugar Consumption in Diabetic patients

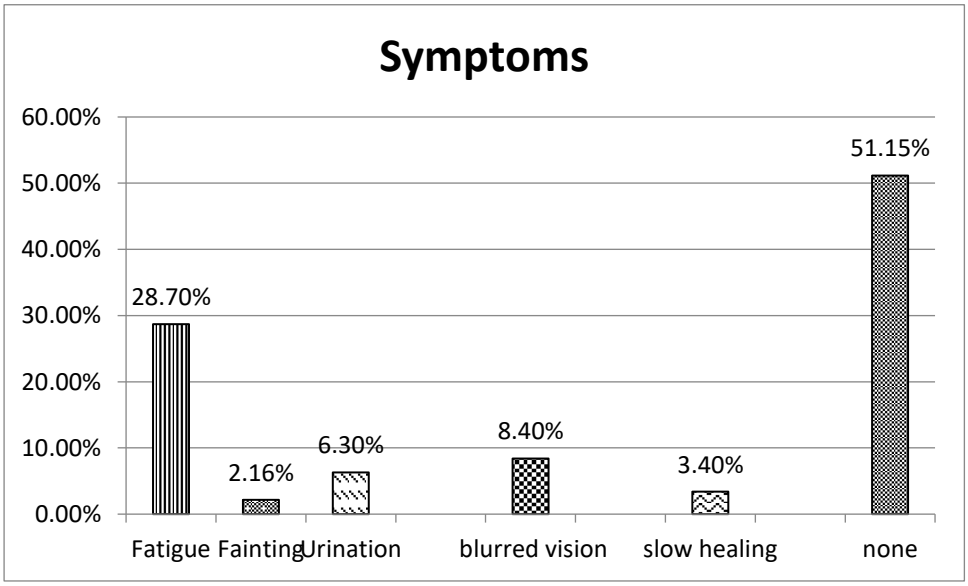

Figure 22: % age Prevalence of Different Symptoms in diabetic Patients

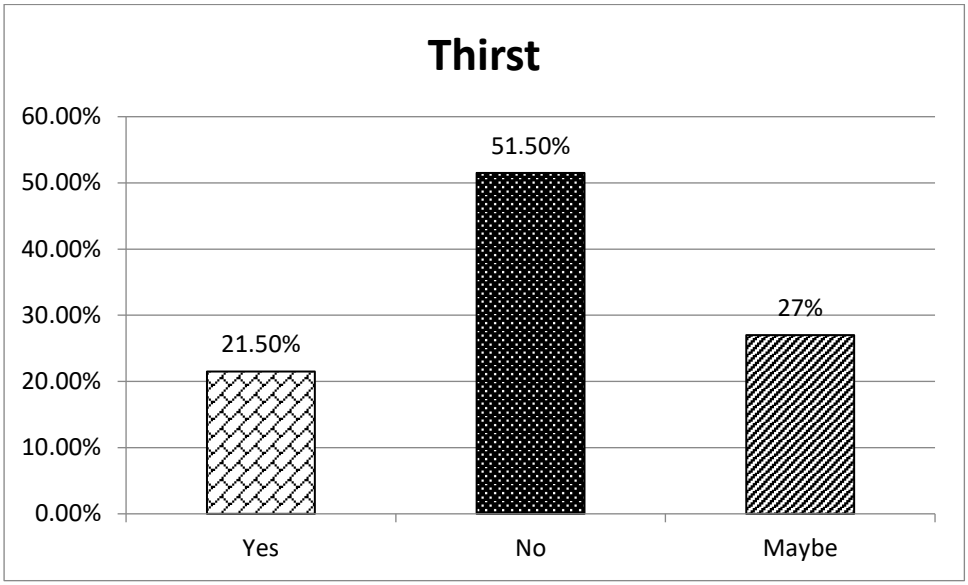

Figure 23: % age of patients which consider Thirst as a major symptom

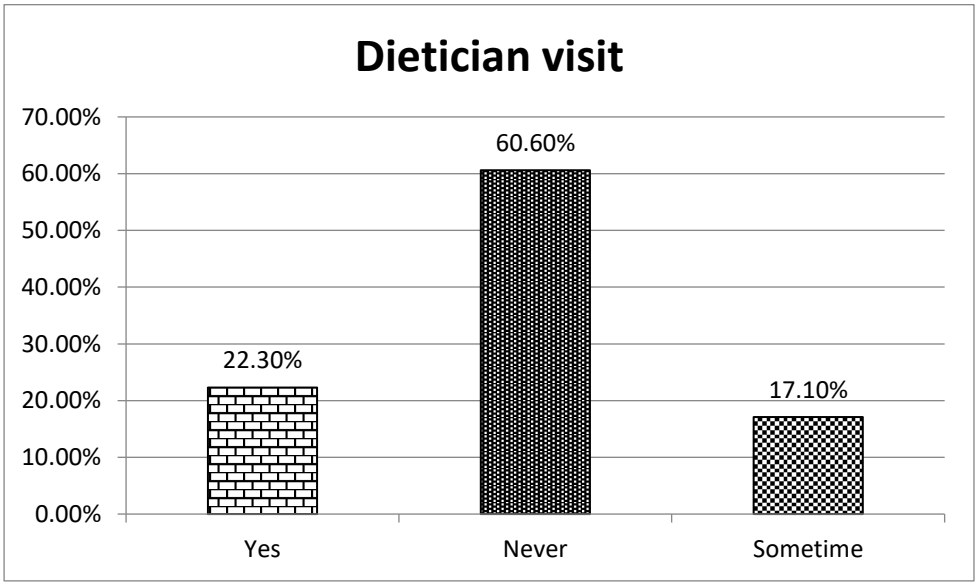

Figure 24: %age of patient who visited Dietician for Diet chart for management of Diabetes

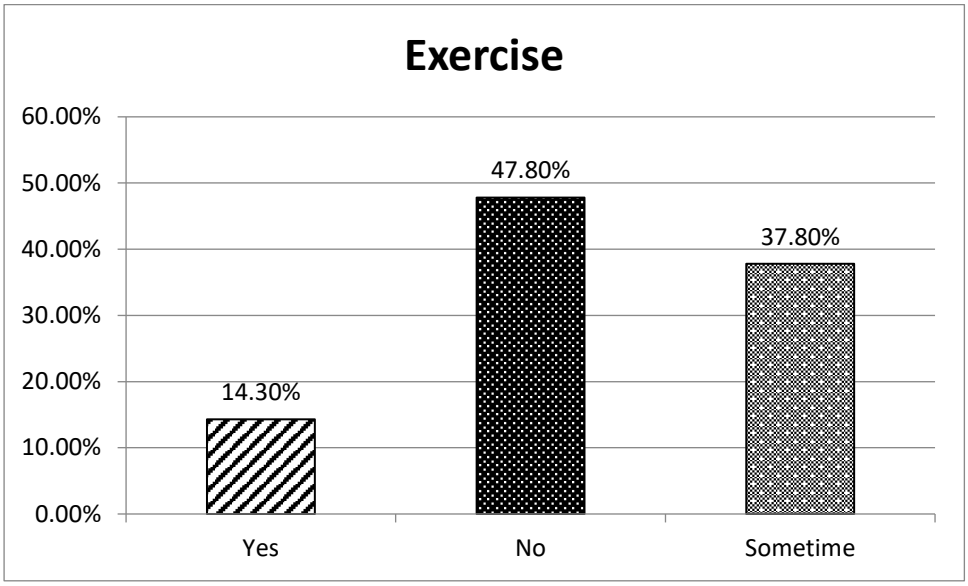

Figure 25: %age of patient who performed Exercises

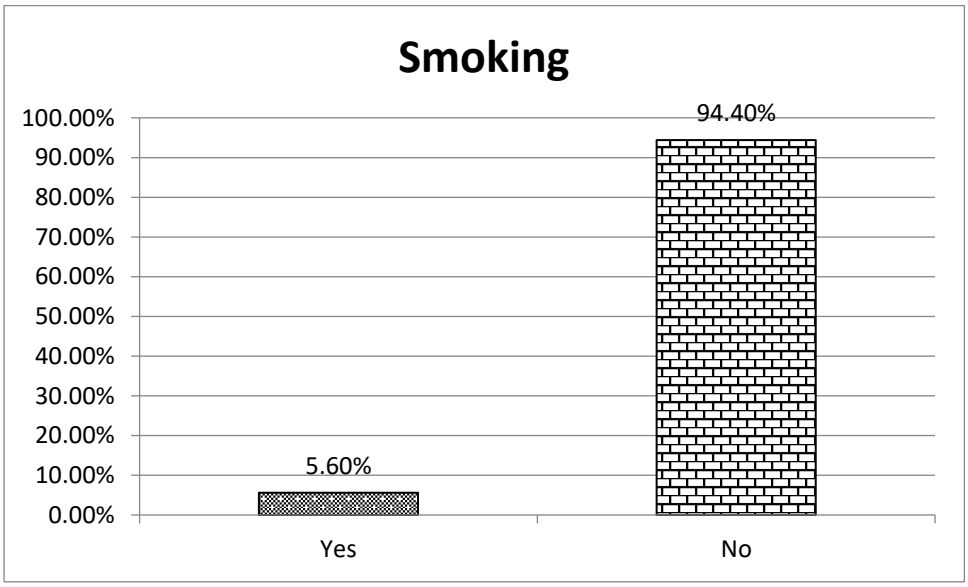

Figure 26: % age of patients who are on Smoking too

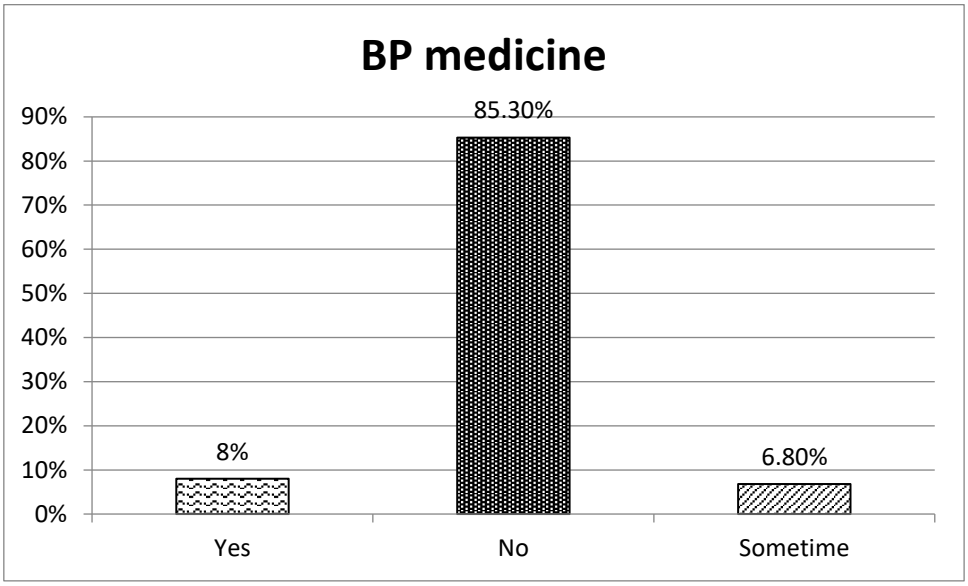

Figure 27: %age of patients who are hypertensive too & also taking BP Medication

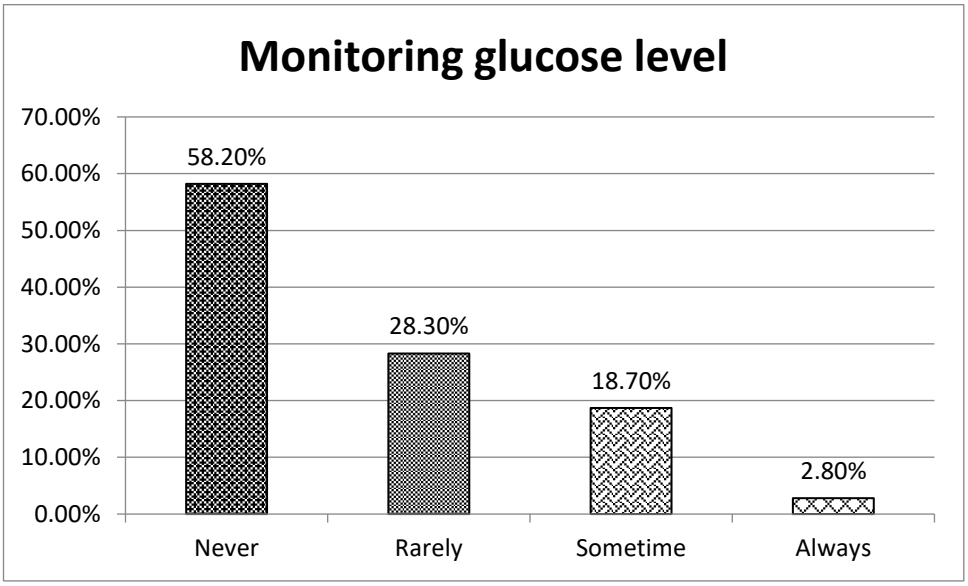

Figure 28: % age patient who are prompt in Monitoring Glucose Level regularly

6.3. Diabetic scenario

50% of respondents have type-1 diabetes and 50% have type-2 diabetes. 57.9% respondents have a family history of diabetes and 42.1% don't have family history of diabetes. 42.1% of respondents use Insulin, 36.8% use Metformin,15.8% use Glucophage and 5.3% use dinil. 26.3% are those who make their own modifications in prescribed dose and 73.7% are those who do not make their own modification. There are 21.1% respondents who skip their medicines while 57.9% don't skip and 21.1% are those who are not sure about it.

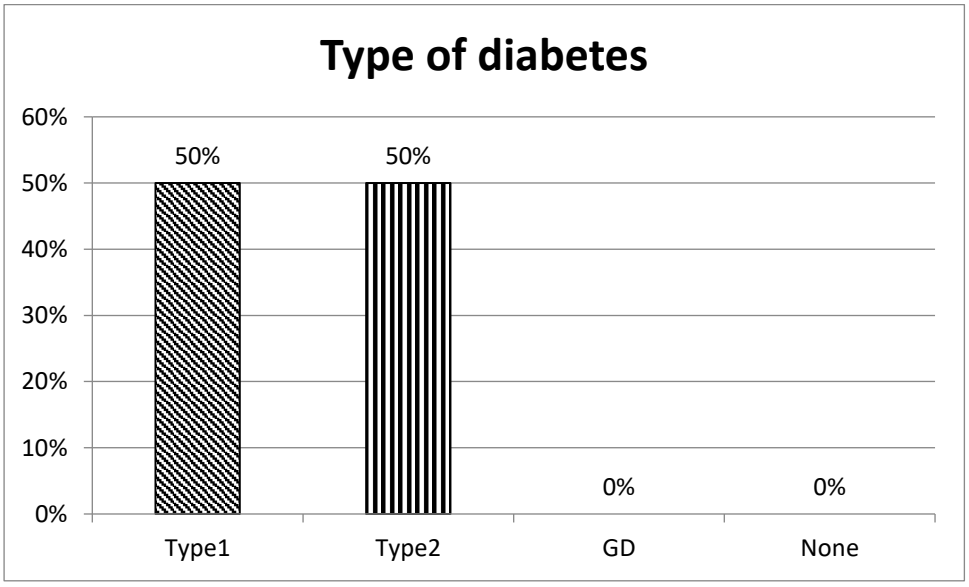

Figure 29: % age of patients on basis of different type of diabetes

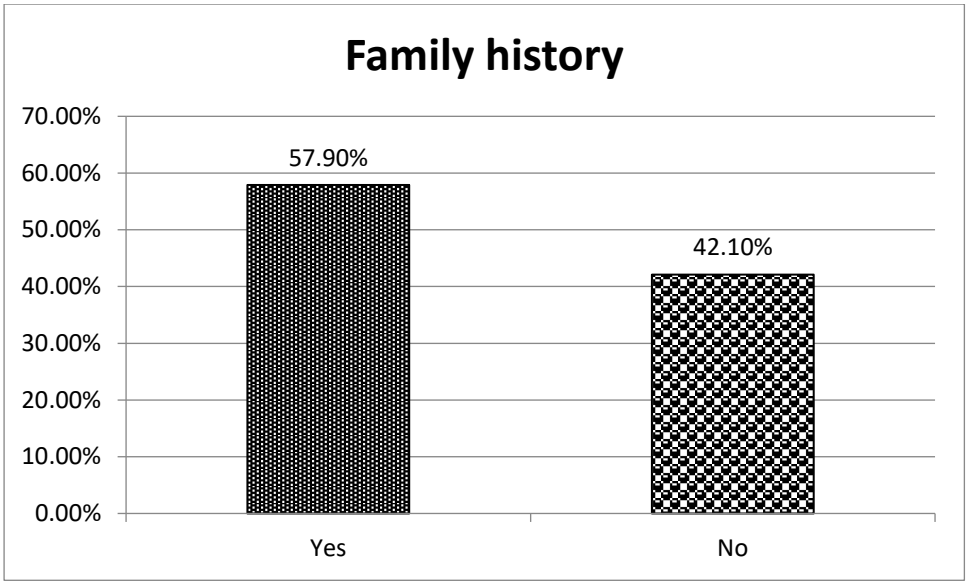

Figure 30: % age of patients on basis of Family history

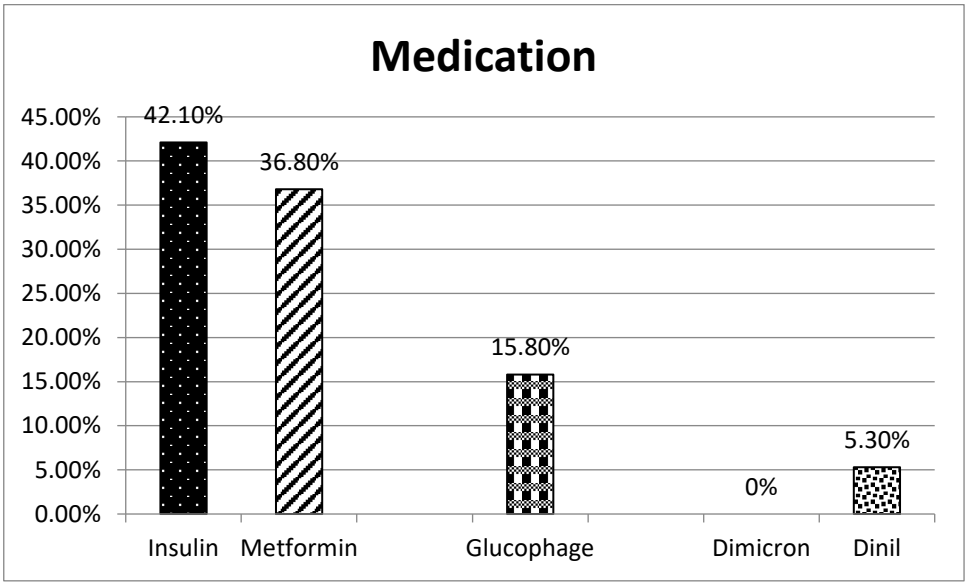

Figure 31: % age of patients on basis of different type of Medication therapy

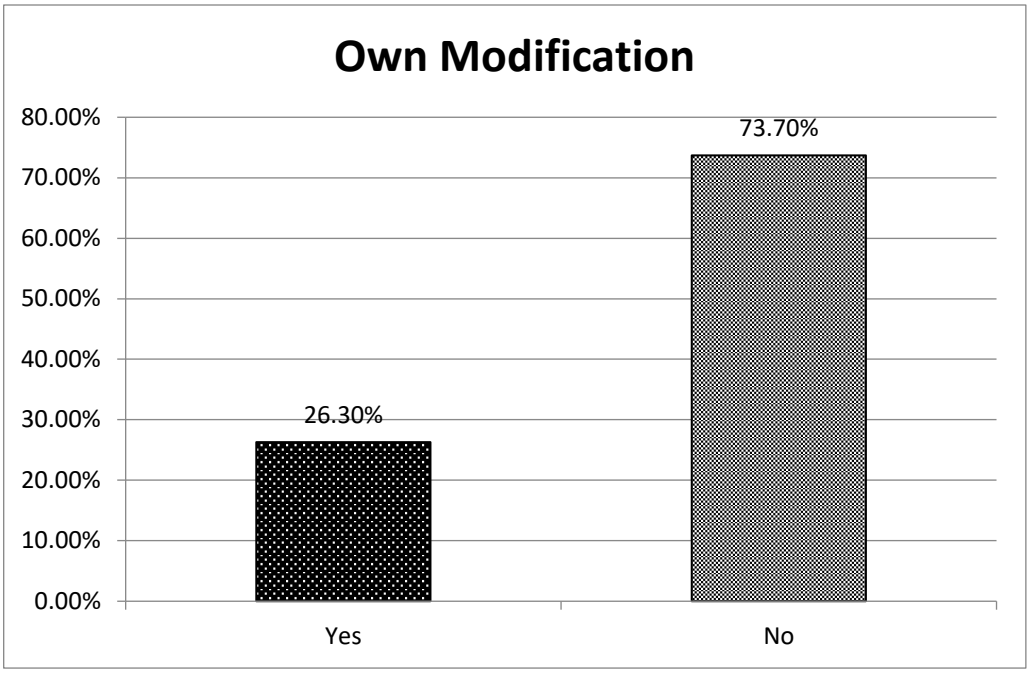

Figure 32: % age of patients who modified their treatment by own

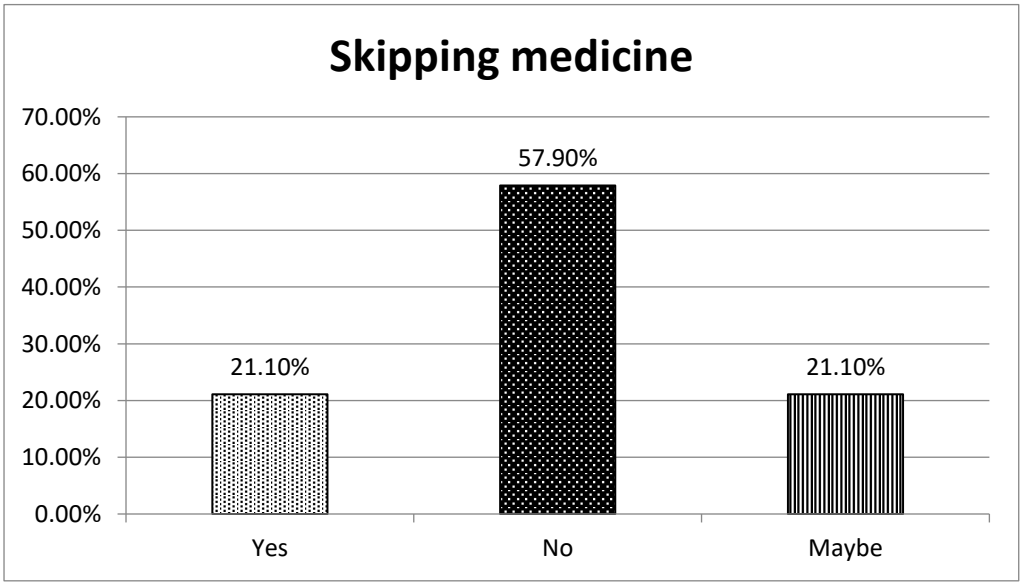

Figure 33: % age of patients who Skip their scheduled Medicine often

6.4 Drug-Drug interactions

10.5% of respondents have Neuropathy due to diabetes. 21.1% are those who have cardiovascular disease. 21.1% are those who have loss of vision due to diabetes.10.5% are those who face nephropathy and 36.8% are those who don't have any concomitant disease. 31.6% are those who take metformin+Dpp-4 inhibitors. 15.8% are those who take metformin + sulfonylurea. 5.3% are those who take metformin + thiazolidinedione and 47.4% of those who don't take any of these medicines. 84.2% respondents have no side effects from diabetes medicines and15.8% respondents have side effects. 47.4% are not sure that their concomitant disease had an impact on diabetes management. 31.6% are those respondents who said that concomitant disease does not affect diabetes control. 15.8% are such respondents who said that concomitant disease moderately affects diabetes control and 5.3% agree that it significantly worsens diabetes control.

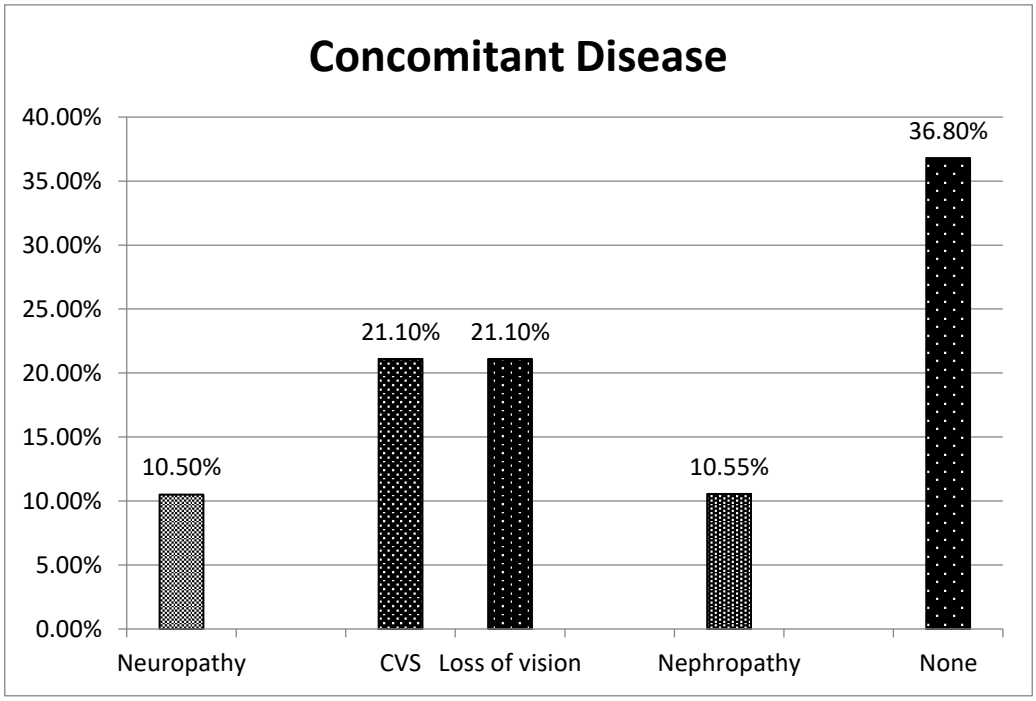

Figure 34: % age of patients who suffers Concomitant Disease

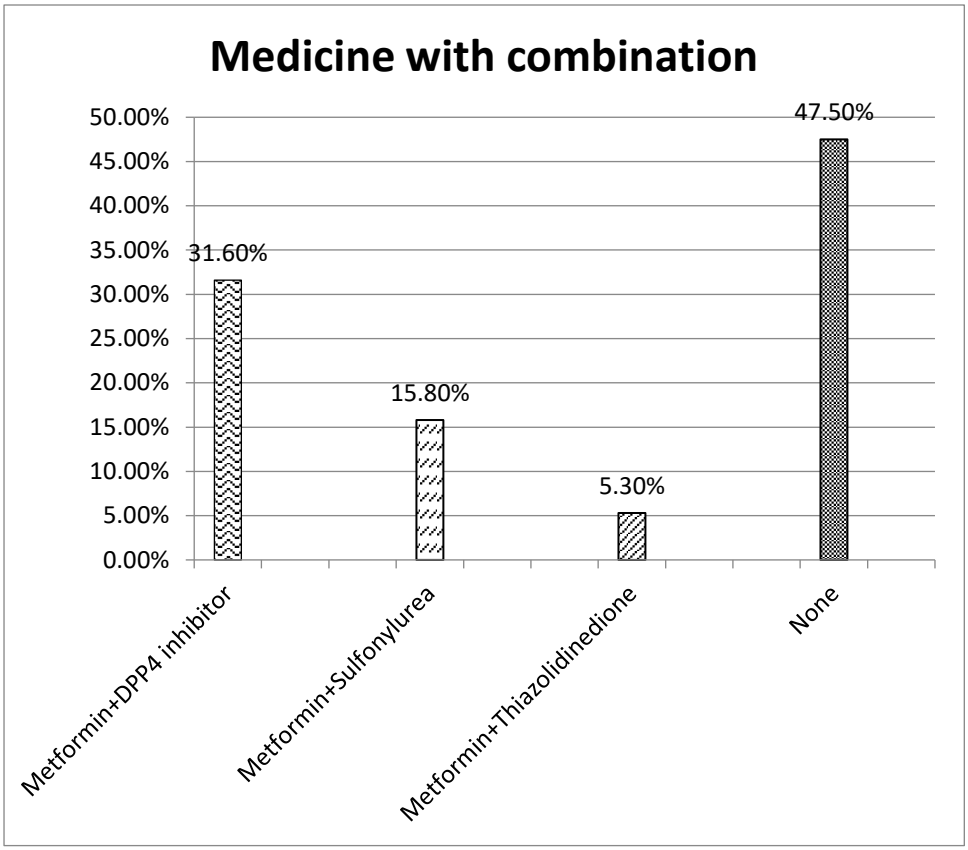

Figure 35: %age of patients who took Medicine combination

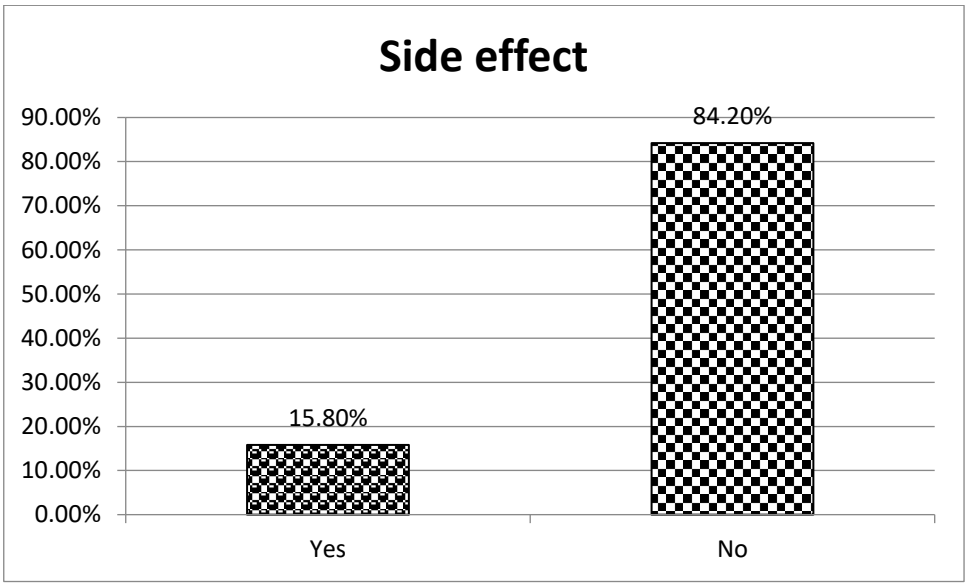

Figure 36: % age of patients who suffer different types of Side effects

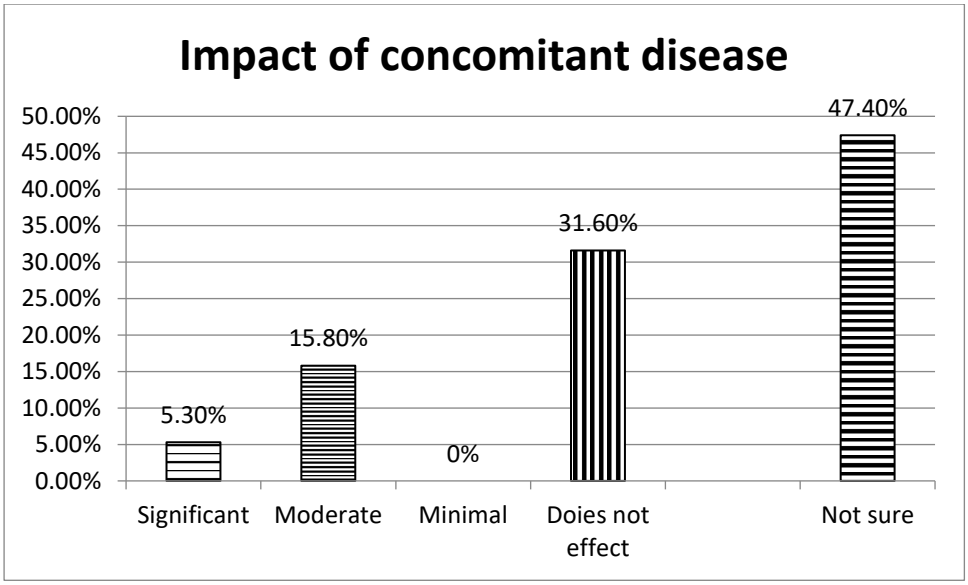

Figure 37: Impact of concomitant disease

7. Conclusion

In this chapter, we discuss research results discussion by using the method of google form. So, it is unreliable, but we use this data for analysis because our sample size is small, we use google form to construct the characteristics of collect data. These provide basic needed information about data. The results shows that there are 73.7% females who perform this survey and 24.7% males who perform this survey. 1.6% are those who prefer not to say their gender. The age of respondent 50.6% are in between the age of 20-35 are below 20. And 7.2% are in between the range of 35-59 and 5.1% are over 50-year-old. The resident's area shows that 54.2% belong to the urban areas and 29.9% are those respondents who belong to rural areas 15.9 are those respondents who live in town.

The weight of respondents 35.1%are between the range of 50-60kg. 24.7 are between the range of 40 to 50kg. And 16.3% are between the range of 60 to 70kg. 15.1% are above 70kg. 3.2% are below 70kg. The marital status of respondents is 79.3% unmarried. 18.1% are unmarried. 1.7% are widowed and 0.8% are divorced. The job of respondents are 76.4% respondents are students and 9.3% do a private job. 8.9% respondents are housewives. 3% have they're on business and 2.5% have government jobs. The education level of respondents is 59.5% who are doing graduation. 23.2% respondents are intermediate. 9.3% of respondents are in matric. And 8% of respondents are doing masters. 69.2% of families live separately and

30.8% in joint families. 89.5% respondents have knowledge about diabetes and 10.5% of respondents have no knowledge about diabetes.

70.9% of respondents know that diabetes management, 29.1% don't know about diabetes management. 97% of respondents think that lifestyle modification can help lower blood sugar level. 88.2% of respondents think that diabetes is a silent killer and 11.8 disagree with it. 30.7% of respondents have a good level of physical activities. While 56.6% are those who have moderate level of physical activity and 12.7% are those who have low level of physics activity. 7.2% of respondents consume high sugar in a day while 62.9% are those who have medium sugar consumption and 29.9% are those who consume low amount of sugar. The symptoms of respondents feel fatigue are 28.7%. and 2.15% are fainting. 6.3% are those who have frequent urination. 8.4% have blurred vision and 3.4% have slow healing and 51.15% do not feel any of those symptoms. 21.5% of respondents have frequent urination with increased thirst. 27% are not sure about it. 51.5% do not have this issue. 22.35% are those respondents who visit dietician while 60.6% are those who never visit and 17.1% are those who visit sometimes. 47.8% respondents are those who don't do exercise regularly 14.3% are those who do exercise regularly 37.8%. 94.4% respondents are those who smoke and 5.6% are those who don't smoke. The BP medication is not used 85.3% respondents, and 8% respondents take BP medication. 6.8% are those respondents sometimes take BP medication.

20.3% respondents monitor their glucose level rarely. 18.7% respondents sometime and 58.2% respondents have never monitored. 2.8% respondents always monitor their glucose level. 50% of respondents have type 1 diabetes and 50% of respondents have type -2 diabetes. On the other hand, 57.9% of respondents have a family history of diabetes and 42.1% of respondents don't have a family history of diabetes. 42.1% respondents use insulin, 36.8% respondents use Metformin, 15.8% use Glimepiride and 5.3% respondents use dinil.

26.3% are those respondents who make there on modification in prescribed dose and 73.7% are those who do not make their own modification. There are 21.1% respondents who skip their medicines while 57.6% don't skip and 21.1% are those who are not sure about it. 10.5% of respondents are those who have neuropathy due to diabetes, 21.1% are those respondents who have cardiovascular disease and 21.1% are those who have loss vision due to diabetes. 10.5% are those who have nephropathy and 36.8% are those who don't have concomitant disease. On the other the combination of medicine are those respondents who take Metformin+Dpp-4 inhibitor 31.6%. 15.8% are those who take Metformin sulfonylureas,

5.3% are those who take Metformin Thiazolidinedione and 47.4% are those who don't take any of this medicine. 84.2% respondents ate those who have not side effect from diabetes medicine 15.8% respondents are those who have side effect.

47.4% are not sure that there is a concomitant disease that had an impact on diabetes management. 31.6% are those respondents who said that concomitant disease does not affect diabetes control 15.8% are such respondents who said that concomitant disease modernly affects diabetes control and 5.3% agree that it significantly worsens diabetes control.

7.1. Future recommendations:

Here are some future recommendations to decrease diabetes among adults, Implement sugar taxes and restrictions on sugary drinks, Increase funding for diabetes research and prevention programs, Develop personalized diabetes prevention plans based on genetic markers, Create public-private partnerships to promote healthy lifestyles, Integrate diabetes screening into routine healthcare check-ups, Expand access to healthy food options in underserved communities, Launch public awareness campaigns to reduce stigma around diabetes, Develop wearable devices and mobile apps for glucose monitoring, Encourage employers to offer diabetes prevention programs, Provide incentives for healthcare providers to prioritize diabetes prevention, Develop targeted interventions for high-risk populations, Create online platforms for peer support and education, Promote urban planning that encourages physical activity, Develop policies to reduce medication costs for diabetes management, Increase funding for diabetes education programs, Encourage schools to incorporate diabetes education into curricula.

7.2. Research of implications:

The research which I conduct is Beneficial for the People that are struggling to those who determine the impact of Diabetes on people and for those researchers who identify the relations between Diabetes about Their own favorite field of work.

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Uncategorized

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