

**A survey on prevalence of diabetes and its management based on local food and food habit in  
Keraniganj, Dhaka.**



[This report presented in partial fulfillment of the requirements for the degree of Bachelor of Pharmacy]

**Submitted To**

The Department of Pharmacy  
Faculty of Allied Health Sciences  
Daffodil International University

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**April, 2023**

## APPROVAL

This Project paper, survey on “**Prevalence of diabetes and its management based on local food and food habit in Keraniganj, Dhaka.**” submitted to the Department of Pharmacy, Faculty of Allied Health Sciences, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of Bachelor of Pharmacy and approved as to its style and contents.

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## Declaration

I, Joy Chandra Ghosh, hereby declare that, this project is done by me under the guidance of Md. A.K. Azad, Assistant Professor & Coordinator M,pharm, Department of Pharmacy, Daffodil International University, in partial fulfillment of the requirements for degree of Bachelor of Pharmacy. The results embodied in this project have not been submitted to any other university or institute for the award of any degree.

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## Certificate

*This is to certify that the results of the investigation that are embodied in this thesis works are original and have not been submitted before in substance for any degree or diploma of this university. The entire present work submitted as a thesis work for the partial fulfillment of the degree of Bachelor of Pharmacy.*



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- Joy chandra Ghosh



*My Parents*

*The persons who always encourage me in every sphere of my life.*

*My teacher*

*The persons who guided me in this process and the committee who kept me on track*

## Abstract

Diabetes is a set of pervasive endocrine conditions characterized by persistently elevated blood sugar levels. The management and prevention of diabetes have been viewed as crucially dependent on dietary and exercise recommendations. This study's objective was to assess the prevalence of diabetes in the area of Keraniganj, Dhaka, as well as the management strategies based on local food and food habits. This study also closely examines if the local diabetes patients are knowledgeable enough about the link between food habits and diabetes. This survey work was carried out from January to April of 2023. This study has conducted among 124 diabetes patients where majority of the patients was male. Almost 70% of the patients in this study were living in the urban area. The high number of diabetes patients in this area who have more than 50 years of age. The prevalence of diabetes was highest among retired citizens (27.4%). More than 71% of diabetes patients in this study adhere to a diet plan on a regular basis. There was almost 91% of the patients who have regularly eat local foods. Rice has been mostly liked as local food among the patients. 35% of the patients like this food. This study, 46% of the participants thought that eating local food could help with diabetes. In their daily lives, 54.8% of the participants eat carbohydrates and 58% of the patients engage in excessive carbohydrate consumption. Of the participants, 41% of the patients prefer to continue eating rice. 54% of the patients took sugar-containing food (sweet, coke, cake etc.) once a month. The majority 46% of the patients practised fewer carbohydrates practice. In this study, 39% of the patients maintained a 2:4:4 carbohydrate, and fat and protein ratio. Where only 22% of the patients maintained a 4:3:3 ratio. 27% of the patients did water fasting but the majority 73% of the patients didn't have much interest in water fasting. Only 25% of the patients followed the ketogenic diet. More than 88% of the participants believed that some foods could affect the release of insulin. The most intriguing finding was that 43% of the patients had no idea that foods high in fiber can lower blood sugar levels. This particular study has an extensive analysis of the local food and food habit among the diabetes patients in this particular area.

## Contents

<b>Chapter</b>	<b>Topic</b>	<b>Page No.</b>
01	Introduction	01-03

<b>Chapter</b>	<b>Topic</b>	<b>Page No.</b>
02	Purpose of the study	04-05

<b>Chapter</b>	<b>Topic</b>	<b>Page No.</b>
03	Literature review	06-07

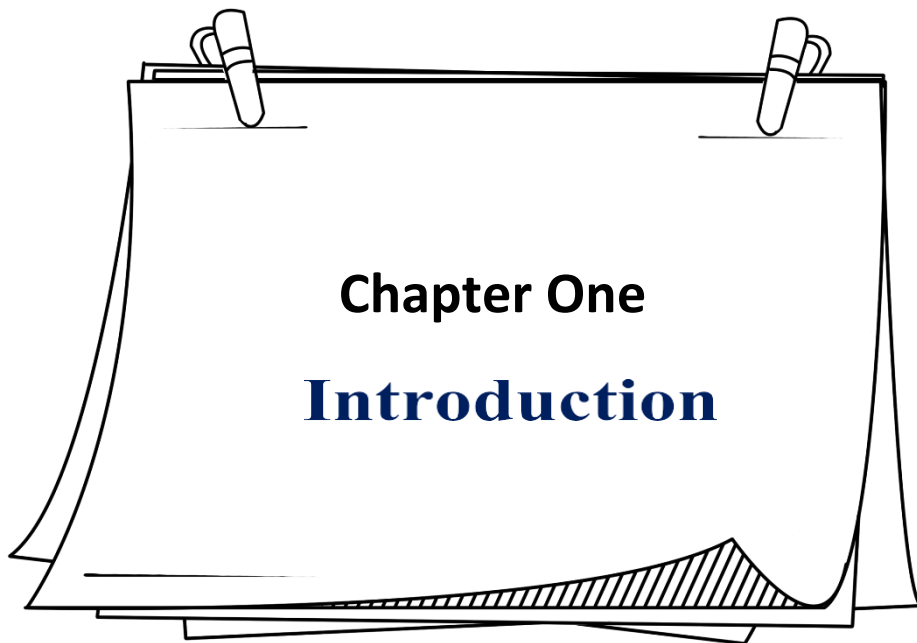
<b>Chapter</b>	<b>Topic</b>	<b>Page No.</b>
04	Materials & Method	08-09

<b>Chapter</b>	<b>Topic</b>	<b>Page No.</b>
05	Result and Discussion	10-20

<b>Chapter</b>	<b>Topic</b>	<b>Page No.</b>
06	Conclusion	21-22

<b>Chapter</b>	<b>Topic</b>	<b>Page No.</b>
07	References	23-25





## 1. Introduction

The most prevalent non-communicable disease in the world today is diabetes. It ranks as the fourth or fifth most common cause of death in the majority of high-income nations, and there is strong evidence that it is widespread in many low- and middle-income nations [1]. Diabetes is a significant and expanding clinical and public health issue. The International Diabetes Federation (IDF) predicted that 642 million adults will have diabetes by 2040, up from its 2015 prediction of 415 million [2].

Globally, the burden of the diabetic disease grew, but the pace of rise was largest in low- and middle-income nations. Across all income groups, having a high BMI level remained the largest contributing factor, but environmental and lifestyle-related factors varied in their contributions [3]. In low- and middle-income countries (LMIC), where diabetes affects four out of five persons worldwide, the disease is becoming more prevalent [4].

Bangladesh, which has 4.7 million instances of undiagnosed diabetes and ranks among the top 10 nations or territories for the number of undiagnosed cases among adults aged 20 to 79 in 2019, significantly adds to the burden of undiagnosed diabetes in South East Asia [5].

The prevention and management of diabetes mellitus have been viewed as being fundamentally dependent on dietary and exercise recommendations [6]. Guidelines from the Ministry of Health state that persons with diabetes and hypertension have poor eating habits. The relationship between an adequate diet and the health issues investigated suggested a delayed improvement in diet, pointing to the urgent need for effective preventative interventions to encourage good eating [7]. The combined consequences of population aging, growing obesity and inactivity rates, and longer diabetes patient lives due to better management are what are driving the coming pandemic [8].

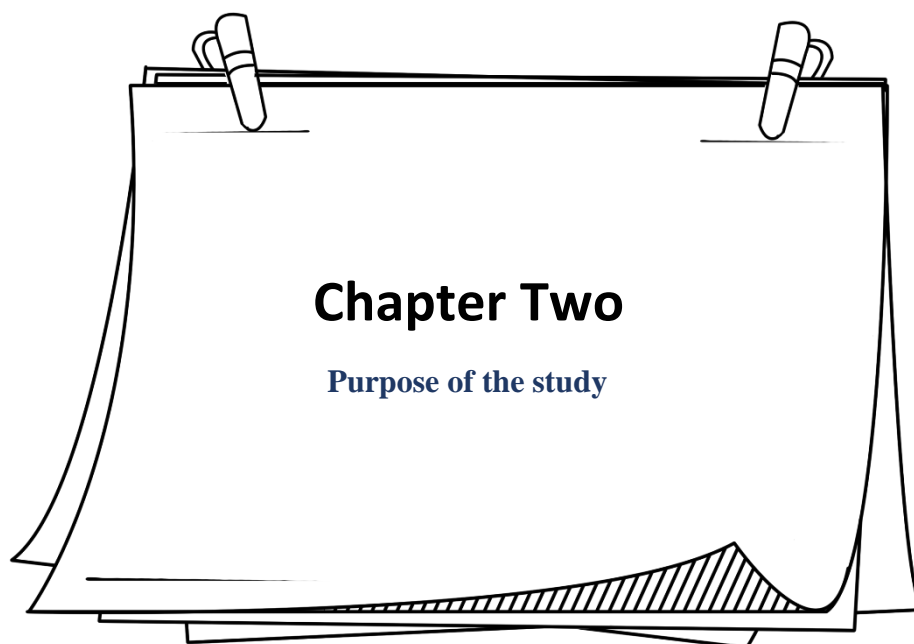
Understanding food and nutrition, as well as the scientific underpinnings of biochemistry, physiology, and pathophysiology, is essential for managing diabetes because it is so closely tied to diet [9]. A balanced diet offers patients a number of health advantages [10]. Diabetes treatments entails a quantitative awareness of the sources of glucose and fat, as well as knowledge of the capacity for oxidizing glucose and fat as well as the requirements for maintenance in the particular instance being treated [11]. According to studies, HCF diets may be the preferred dietary therapy for some people with the maturity-onset form of diabetes [12]. More important than the quantity of these macronutrients is the type of dietary fats and carbs that are ingested. It has been demonstrated that diets high in whole grains, fruits, vegetables, legumes, and nuts, low in refined grains, red or processed meats, and sugar-sweetened beverages reduce the incidence of diabetes and improve glycaemic control and blood lipids in diabetes patients [13]. The continuous use of a low carbohydrate diet no longer seems acceptable because a diet high in complex carbohydrates and leguminous fiber improves all facets of diabetic control [14].

A fast-food atmosphere may affect dietary habits and, in turn, the prevalence of diabetes [15]. Individuals who live in areas with a high concentration of fast-food and convenience businesses but few grocery or produce stores have a far increased risk of developing obesity and diabetes [16]. fast-food outlets is associated with increased risk of type 2 diabetes and obesity [17]. Prevalence of gestational diabetes is rising, primarily as a result of the ongoing rise in obesity among women of reproductive age. Fast food consumption prior to conception is an independent risk factor for gestational diabetes [18].

A low-carbohydrate diet outperforms a standard low-fat one in terms of glycemic management, insulin sensitivity, and diabetes-related dyslipidemia with a decrease in triglycerides [19]. Low glycemic index diets reduced glycosylated proteins in type 1 and 2 diabetes, while diets high in cereal fiber have been linked to improved glycemic control [20]. A study showed rice-oriented patterns has increased the chance of developing diabetes mellitus than balanced diet [21]. Dietary carbohydrates may affect the risk of type 2 diabetes, and studies have repeatedly shown that soluble fiber lowers postprandial glucose and insulin levels in people with diabetes [22].

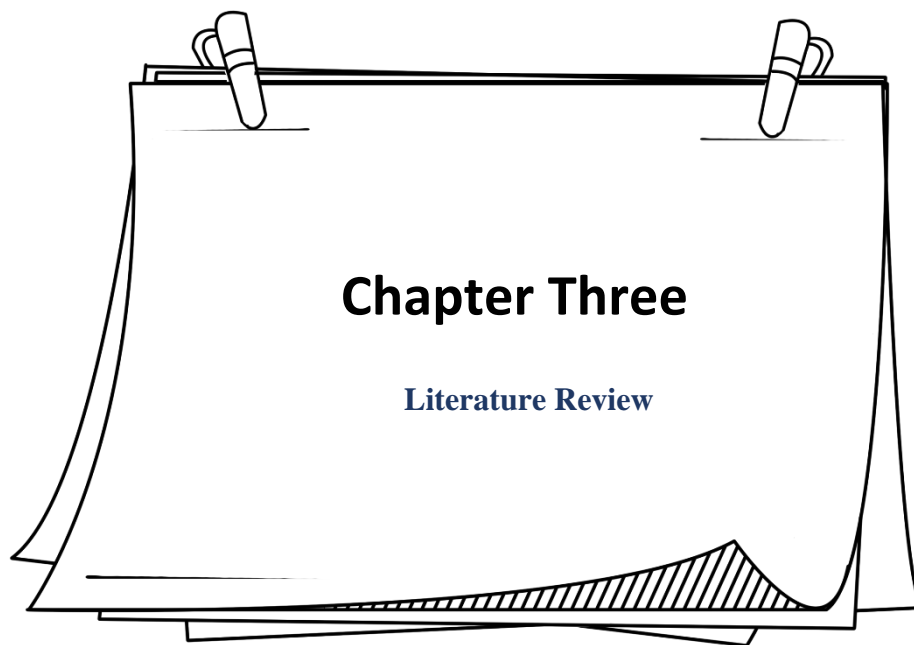
A diet high in monounsaturated fatty acids has positive effects on the blood pressure, whereas similar effects on glucose and lipid levels are reported in normotensive Type 2 diabetes people [23]. In the management of Type 2 diabetes, an increased intake of polyunsaturated fatty acids, particularly long-chain n-3 fatty acids, may have both positive and negative consequences [24]. The inhibitory action and modification of cytokine release, as well as the restoration of intracellular oxidative status, are thought to be the causes of n-3 PUFA's positive effects on T cell activities in type I diabetes [25].

A keto diet is one that has a lot of fat, little carbohydrate, and enough protein. The intention is to switch the body's energy source from carbohydrates to fat [26]. Improved satiety is one of the keto diet's tactical advantages because it frequently leads to a reduction in daily energy consumption. This further aids patients in losing weight and managing their blood sugar levels. The capacity to react to or adjust to conditional variations in metabolic demand is known as metabolic flexibility. The pathophysiology of insulin resistance in T2D leads to a reduction in the metabolic flexibility of the systems that choose between glucose and fatty acids as a fuel source [27]. A study that put 28 people with Type II diabetes on a ketogenic diet for four months discovered metabolic changes happened without regard to weight loss, specifically noting a 16% drop in HgA1c and most individuals reducing or stopping their diabetes medication [28].



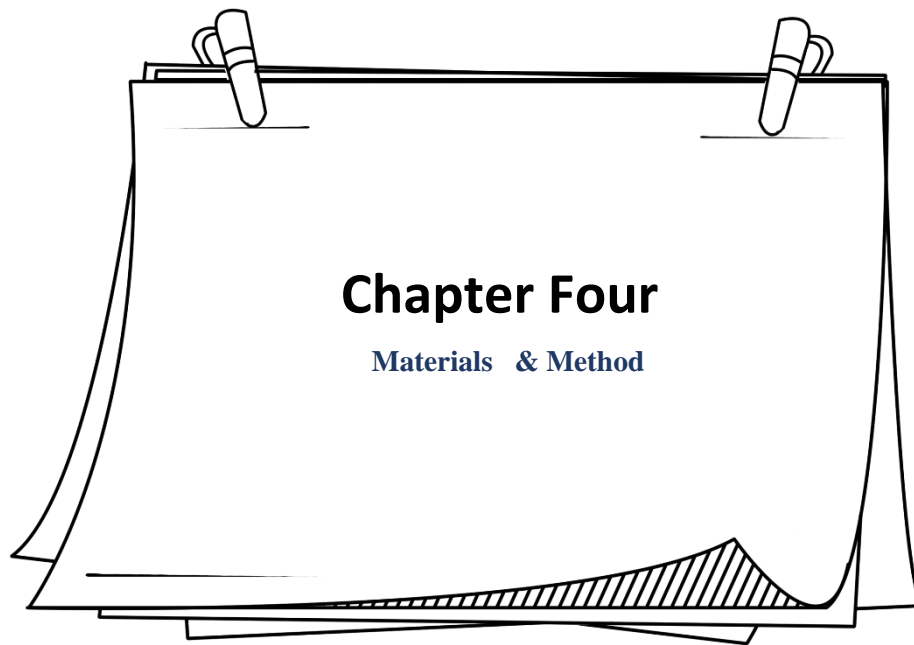
## **2. Purpose of the study**

This study aimed to determine the intensity of diabetes and the management system based on local food and food habits in keraniganj, Bangladesh. In this study, the food habit of diabetes patients will be evaluated. To find out the importance of local foods in area. Another purpose of seeing the comparison between different type of food and it's effect on the treatment of diabetes. This study also focuses on special attention to management system of diabetes patients which can carry out a better clinical study. Besides ensuring safe and effective management system for prevention and control of this diseases, this survey is much more needed.



### 3. Literature review

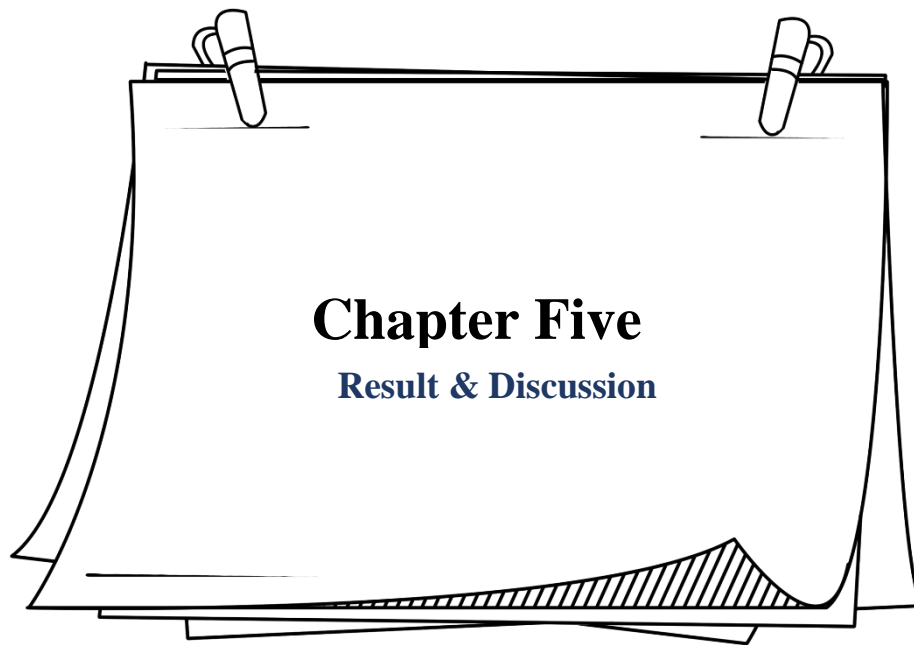
- ✚ A study of the eating habits of 73 Asian-Indian adults in the New York City and Washington, D.C., areas revealed that as a result of acculturation, this population now chooses American or other ethnic foods more frequently for main meals and substitutes traditional sweets with cookies, doughnuts, and other Western pastries. The amount of time spent in the country had an impact on the cooking fats used; individuals who had been here longer than five years looked to have consumed less butter and ghee (clarified butter) and had switched to margarine. These people continued to eat curried vegetables, yogurt, dhal (a spiced lentil meal), chappati (flat bread), and rice. Upon immigration to the United States, this group reported increasing their consumption of whole grain breads, fish, chicken, meat, potato chips, cakes, cheese, fruit, and alcoholic and nonalcoholic beverages (other than water) [29].
- ✚ According to the study, 12.33% of people had diabetes, while 11.57% had pre-diabetes. When compared to men, females had a higher prevalence. Ageing, being overweight or obese, living a sedentary lifestyle, smoking, and eating habits all had statistically significant relationships with the prevalence of diabetes and pre-diabetes. A fiber-rich diet, frequent exercise both at work and at home, and blood sugar monitoring after 35 years are some recommendations for managing diabetes [30].
- ✚ In type 2 diabetes (T2D), postprandial hyperglycemia (PPHG) is closely associated with the eventual emergence of cardiovascular problems. Therefore, lowering postprandial hyperglycemia excursions is crucial for treating T2D in order to decrease the progressive loss of  $\beta$ -cell function and avoid cardiovascular issues. The circadian clock regulates and exhibits daily oscillation in most of the metabolic functions implicated in PPHG, including  $\beta$ -cell secretory function, GLP-1 secretion, insulin sensitivity, muscle glucose uptake, and hepatic glucose synthesis. As a result, postprandial glycemia exhibits diurnal fluctuation with a larger glycemic response following meals with the same carbohydrate content when ingested at night as opposed to during the day. T2D is linked to PPHG and is associated with a food pattern that is not in sync with the circadian clock (skipping breakfast, for example). Contrarily, higher consumption in the morning (i.e., a high-energy meal) than in the evening, regardless of overall calorie intake, has a resetting effect on clock gene oscillations and positive effects on appetite control, weight loss, and PPHG decrease. Therefore, a possible therapeutic strategy to ameliorate PPHG in T2D involves resetting clock gene expression with a diet intervention consisting of meal timing that is in sync with the circadian clock, or moving the majority of calories and carbohydrates to the morning hours. This review will concentrate on new studies that demonstrate how a high-energy breakfast diet (Bdiet) improves glucose metabolism, postprandial glycemic excursions, and weight loss in T2D by resetting and synchronizing circadian clock genes expression [31].





#### **4. Materials & Method**

This study was conducted from January to April 2023 in keraniganj, Dhaka. Additionally, several questions were created to conduct interviews. Total 124 people participated in this survey and they all were affected by different types of diabetes. Our interviewers also took responses from these patients. Interviewers asked some questions about personal information and then asked about the food habit and lifestyle. These questionnaires have been arranged into three different segments such as sociodemographic information, information regarding local food and food habit. Almost 22 individual questions have been included in these three segments.



## 5. Result and Discussion

This following study was conducted in Keraniganj, Dhaka on the prevalence of diabetes and its management systems based on local foods and food habits.

### 5.1 Sociodemographic information

In this study, there was in a total of 124 diabetes patients participated in this study. Where the majority of them were male. Almost 57% of the participants were male (table: 01). The high number of diabetes patients in this area who have more than 50 years of age (table: 02). The prevalence of diabetes was highest among retired citizens (27.4%) (table:03). Almost 70% of the patients in this study were living in the urban area (table: 04).

#### 5.1.1 Gender

	Number of Patients (n=124)	Percentage (%)
Male	71	57
Female	53	43

Table 5.1.1: Gender

#### 5.1.2 Age

Age	Number of patients (n=124)	Percentage (%)
10-20	2	1.8
21-30	13	11
31-40	11	9
41-50	36	29
50+	62	48.8

Table 5.1.2: Age

#### 5.1.3 Occupation

Occupationl	Number of Patients (n=124)	Percentage (%)
Business	21	16.9
Housewife	31	25
Retired	34	27.4
Jobholder	26	20.9
Others	12	9.6

Table 5.1.3: Occupation

#### 5.1.4 Location

Place	Number of patients (n=124)	Percentage (%)
Urban	83	70
Rural	41	33

Table 5.1.4: Location

## 2. Information regarding local foods.

### 5.2.1 Diet chart

More than 71% of diabetes patients in this study adhere to a diet plan on a regular basis. Just 29% of the patients didn't adhere to the recommended diet.

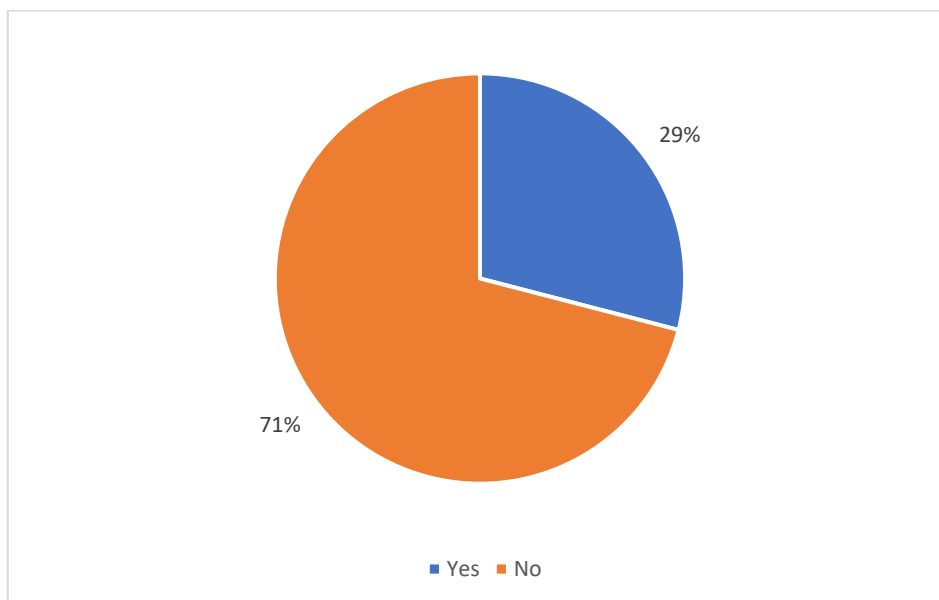


Figure 5.2.1: Diet chart

### 5.2.2 Local foods

There was almost 91% of the patients who have regularly eat local foods. Only 9% of the participants didn't take local food as much.

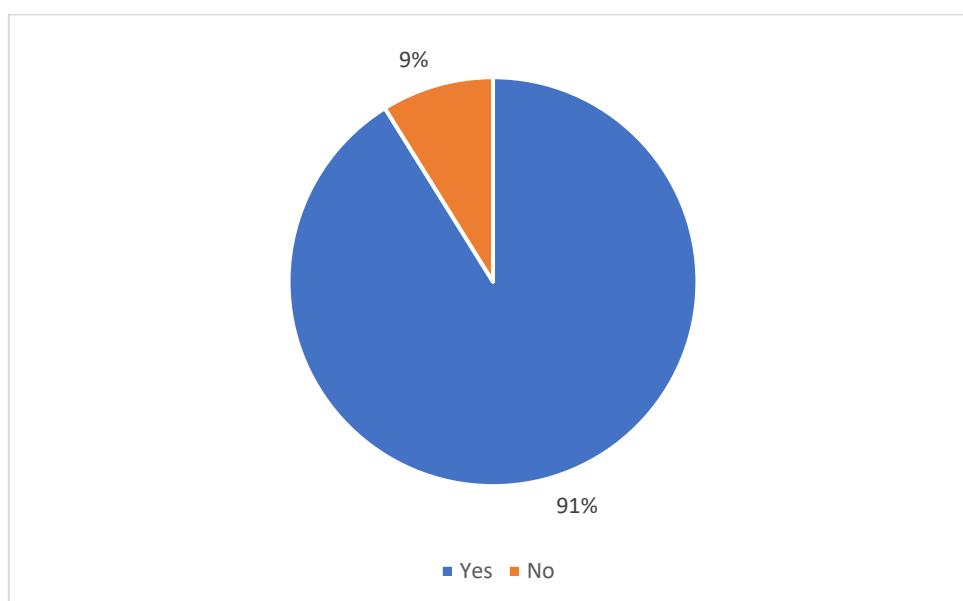


Figure 5.2.2: Local foods

### 5.2.3 Interest on local food

Rice has been mostly liked as local food among the patients. 35% of the patients like this food. 21% of the patients has liked fast food which as the second highest.

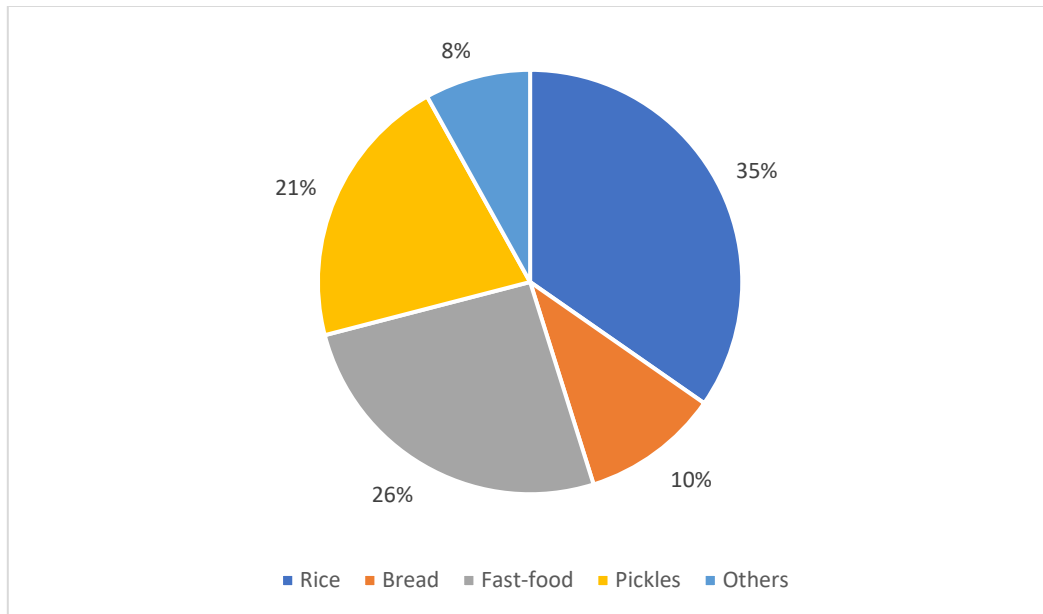


Figure 5.2.3: Interest on local food.

### 5.2.4 Benefit in diabetes

In this study, 46% of the participants thought that eating local food could help with diabetes. 37% of people did not agree with it.

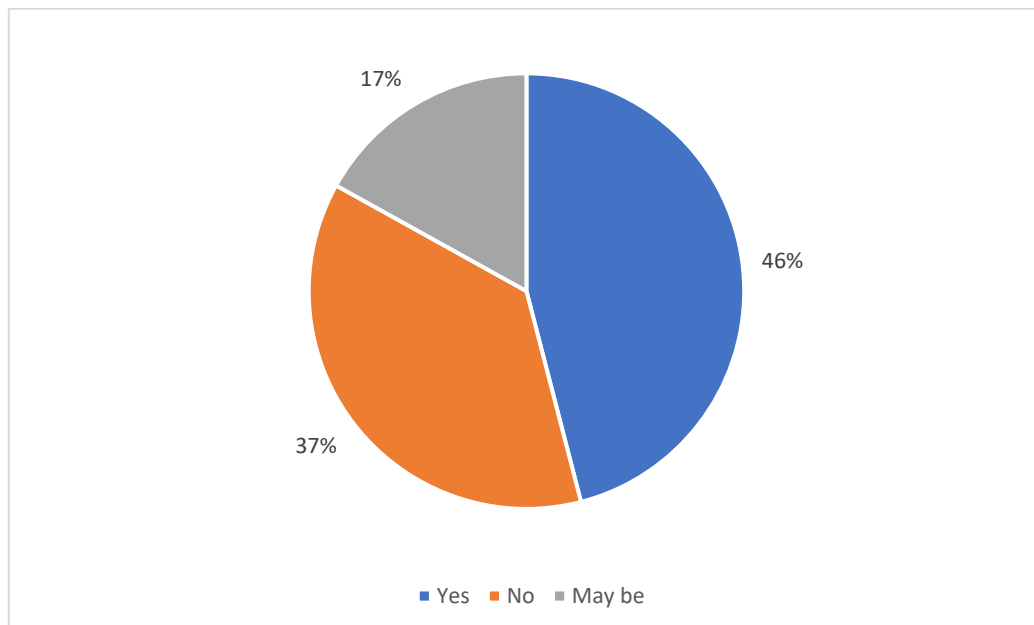


Figure 5.2.4: Benefit in diabetes

### 3. Food habit

#### 5.3.1 Choice of food

In their daily lives, 54.8% of the participants eat carbohydrates. Whereas just 7.2% of patients consume dairy products, 13% of participants consume protein, 8.8% consume fat, and 16.1% of participants consume fruits and vegetables.

Types of food	Number of patients (n=124)	Percentage (%)
Fruit & Vegetable	20	16.1
Carbohydrates	68	54.8
Fat	11	8.8
Protein	16	13
Dairy food	9	7.2

Table 5.3.1: Choice of food.

#### 5.3.2 Over eating carbohydrates

Around 58% of the patients engage in excessive carbohydrate consumption. Only 48% of the patients were warned against eating too many carbs.

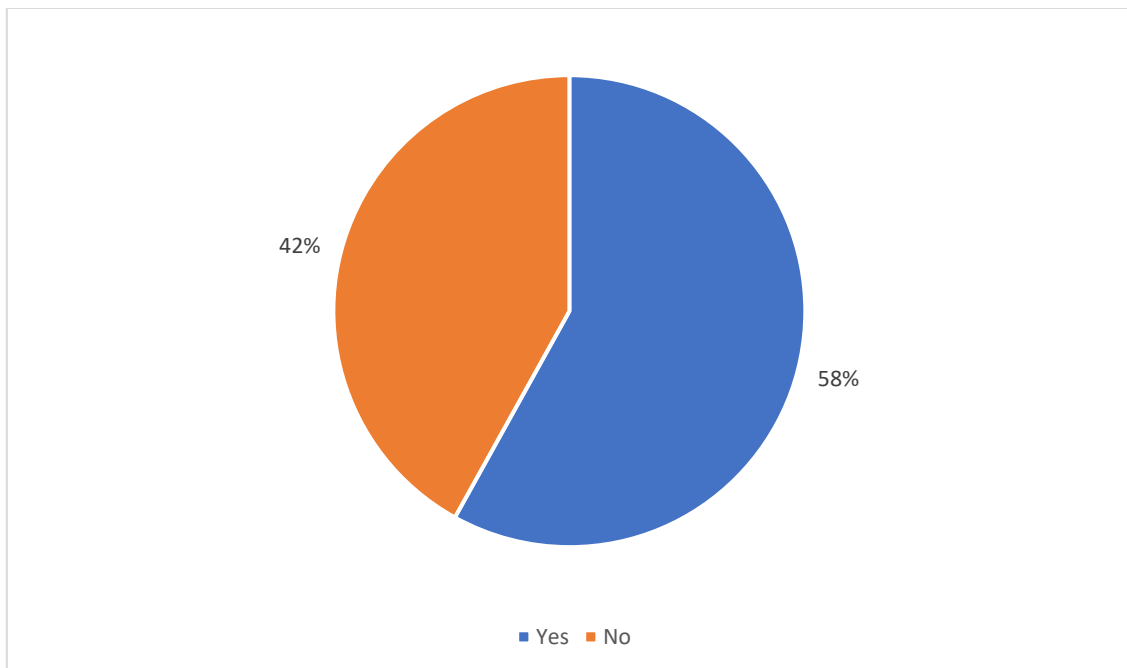


Figure 5.3.2: Over eating carbohydrates

### 5.3.3 Carbohydrates

Of the participants, 41% of the patients prefer to continue eating rice. Just 19% of patients prefer oats in their diet, while 26% of patients enjoy bread.

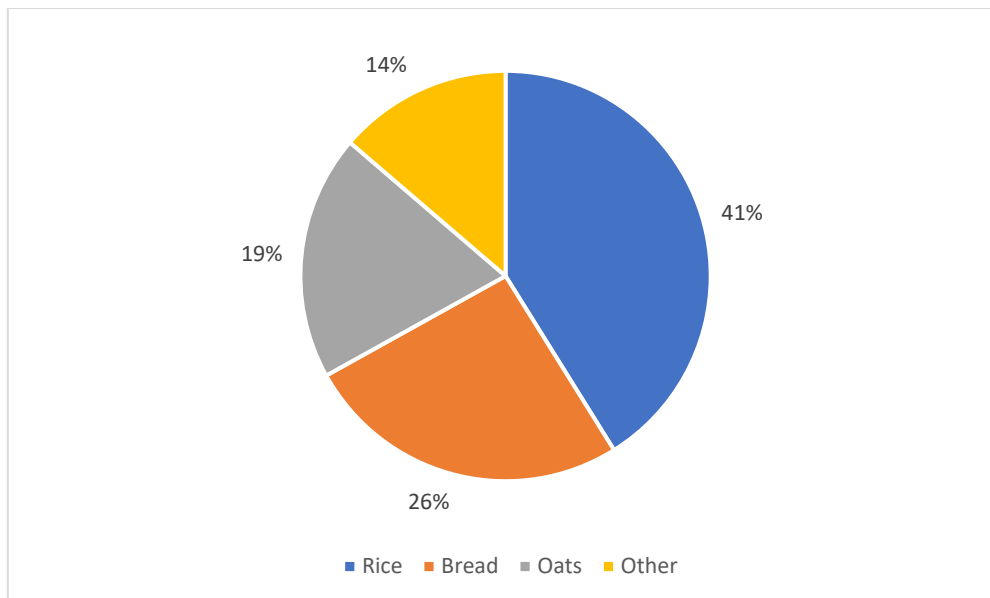


Figure 5.3.3: Carbohydrates

### 5.3.4 Quantity of carbohydrates per day

A large majority 100g of rice was consumed daily by 42% of the patients. 15% of the patients consumed one cup of oats daily, 17% consumed biscuits, and 19% of the patients consumed two pieces of bread per day.

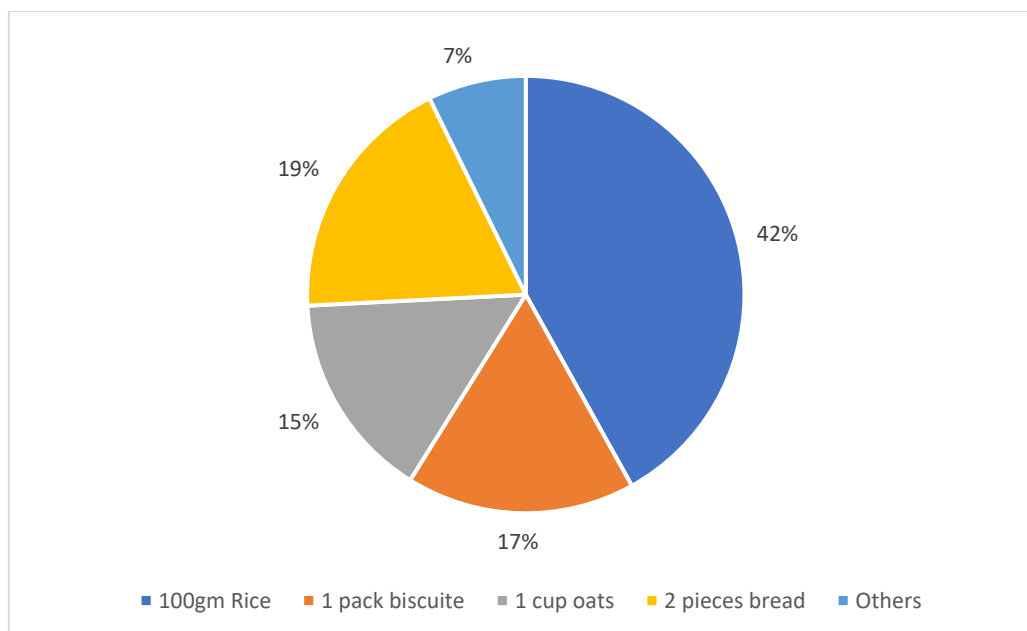


Figure 5.3.4: Quantity of carbohydrates per day.

### 5.3.5 Sugar containing food

In this study, 54% of the patients took sugar-containing food (sweet, coke, cake etc.) once a month. More than 23% of the patients took twice a week, 17% once a week and only 6% of participants have found who never took high sugar-containing foods.

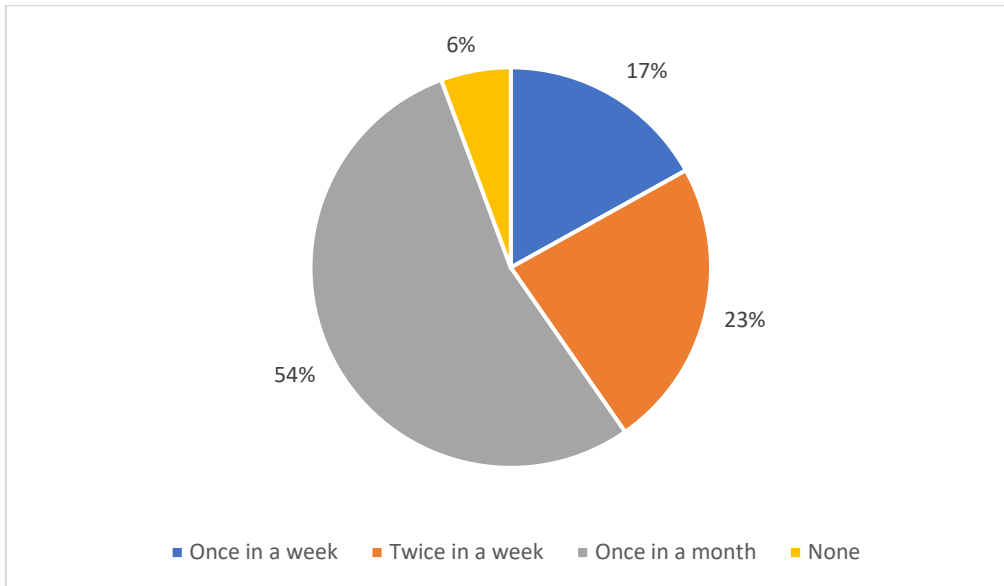


Figure 5.3.5: Sugar containing food.

### 5.3.6 Quantity of meal time

Most of the patients (56%) took meals three times, 19% 2 times, 14% 4 times and only 11% 5 times.

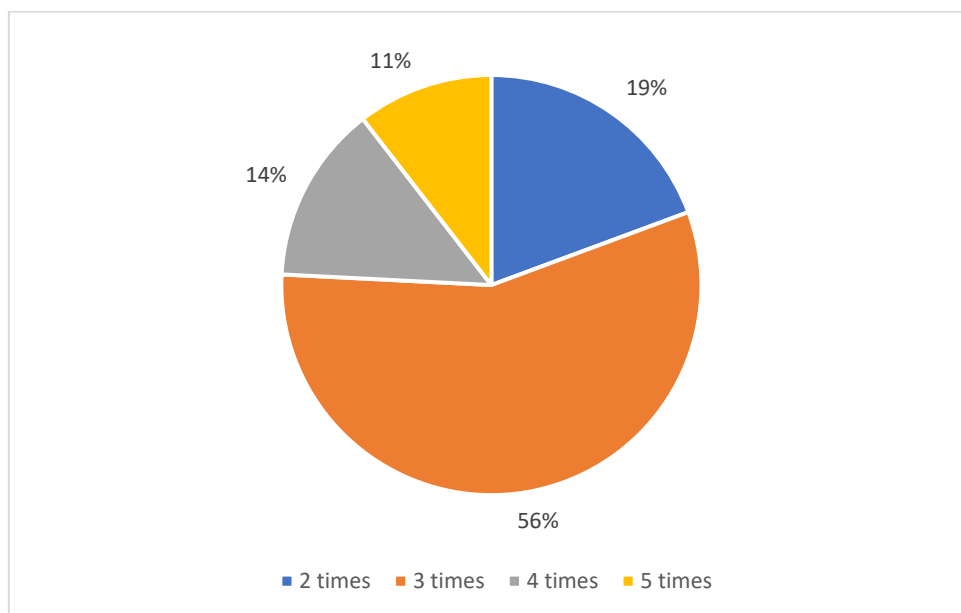


Figure 5.3.6: Quantity of meal time.



### 5.3.7 Less carbs practice

The majority 46% of the patients practised fewer carbohydrates practice, 36% never showed interest in fewer carbs practice and only 18% of the patients sometimes practised it.

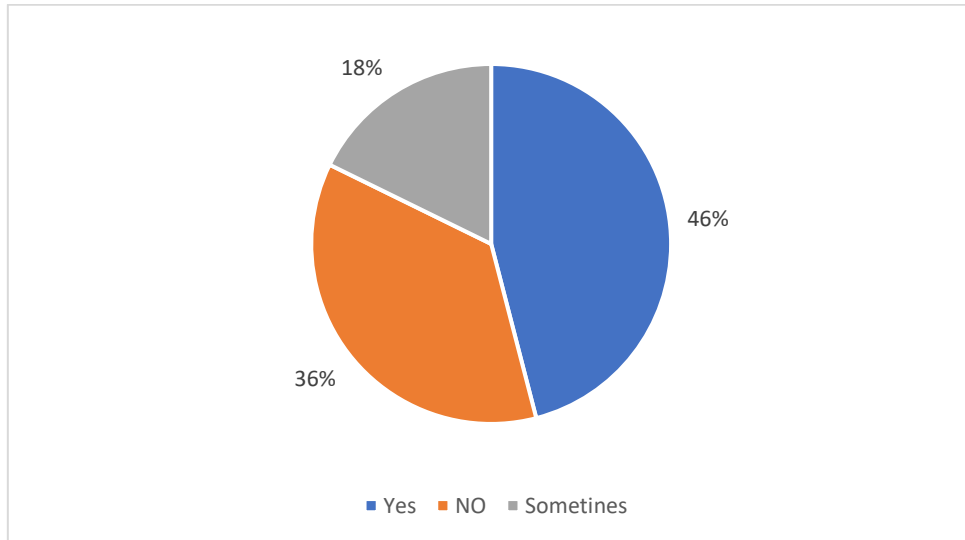


Figure 5.3.7: Less carbs practice

### 5.3.8 Carbohydrates: Fats: Proteins ratio

In this study, 39% of the patients maintained a 2:4:4 carbohydrate, and fat and protein ratio. Where 26% maintain a 4:2:3 ratio, 22% of the patients maintained a 4:3:3 ratio.

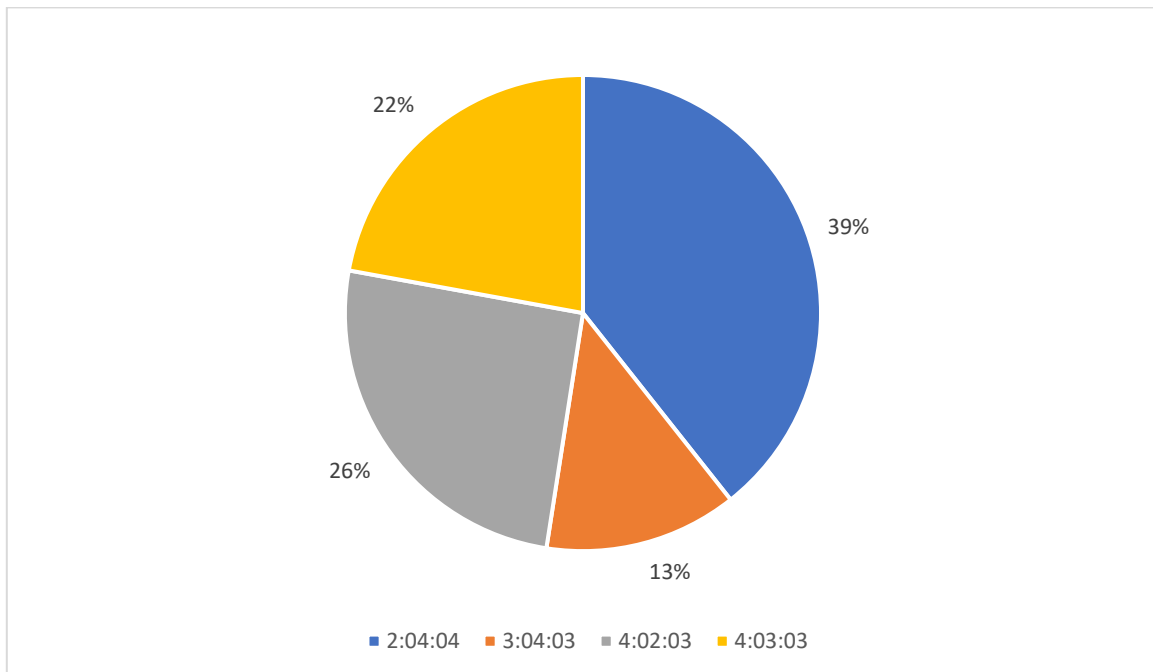


Figure 5.3.8: Carbohydrates: Fats: Proteins ratio.

### 5.3.9 Water fasting

Only 27% of the patients did water fasting but the majority 73% of the patients didn't have much interest in water fasting.

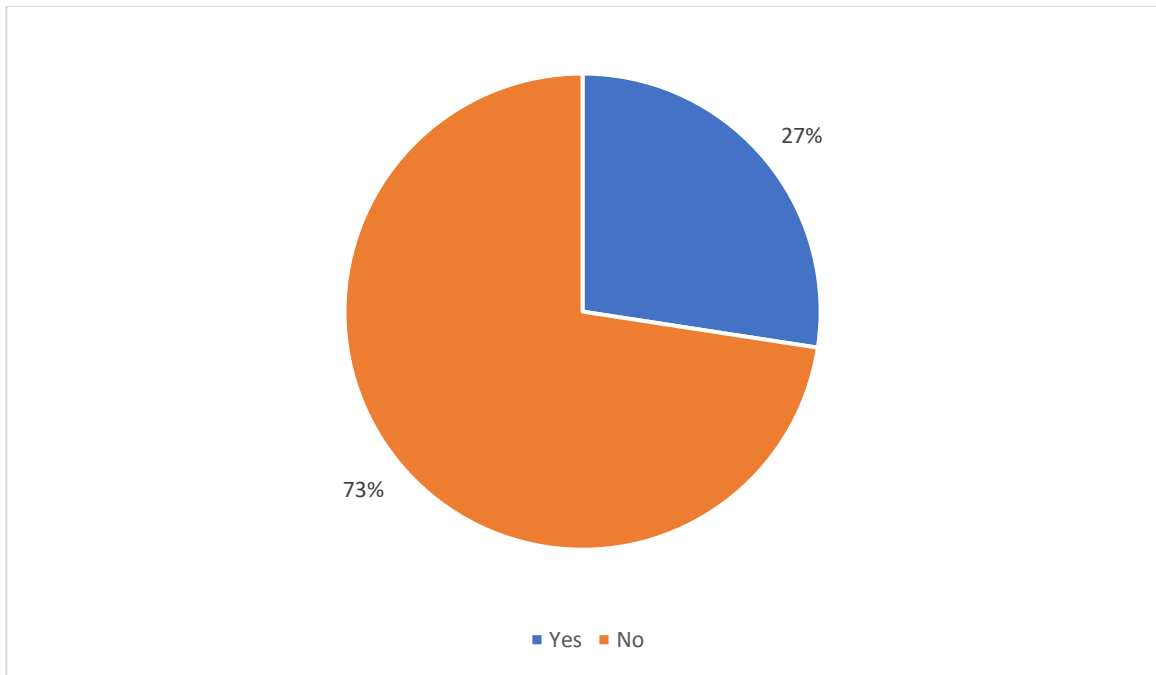


Figure 5.3.9: Water fasting

### 5.3.10 Breakfast timing

38% of the participants' patients ate breakfast before ten o'clock in the morning. Thirty percent of the patients ate breakfast prior to 9:00 am. Before 8:00 am, more than 22% of the patients took it. Only ten percent of the patients took it before eleven o'clock.

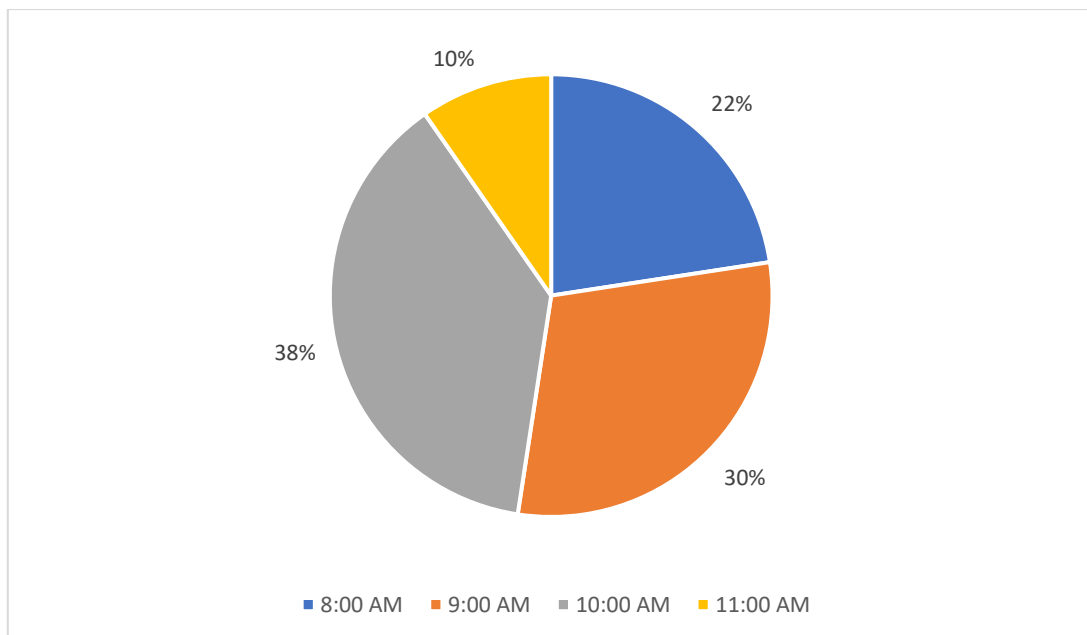


Figure 5.3.10: Breakfast timing

### 5.3.11 Keto diet

In this study, more than 25% of the patients followed the ketogenic diet, compared to 75% of the patients who never did.

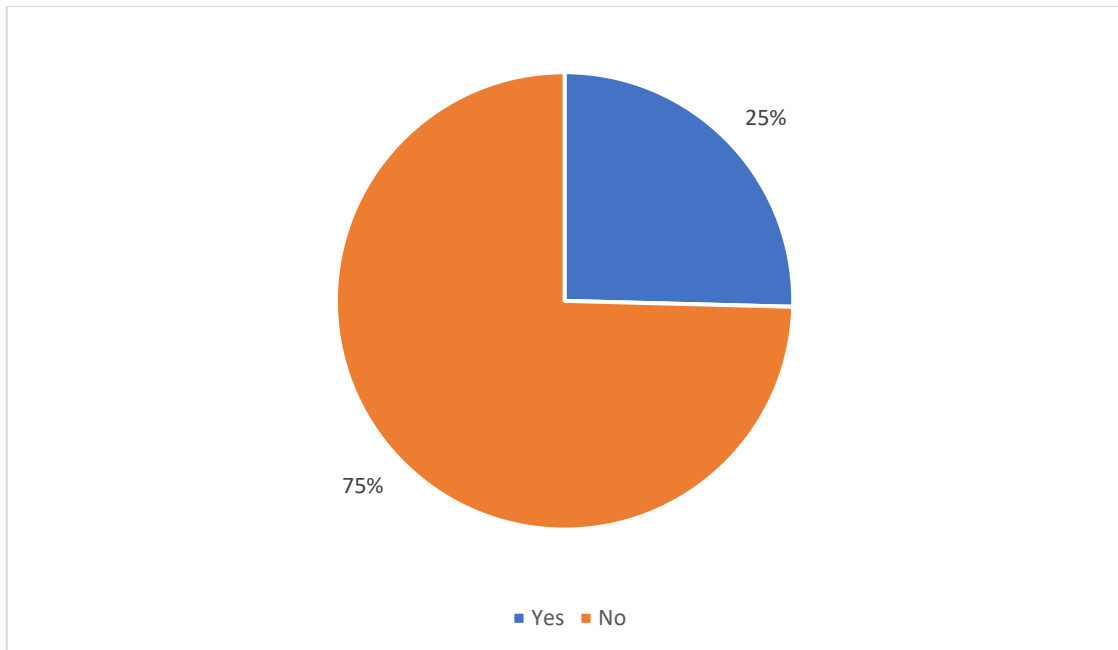


Figure 5.3.11: Keto diet

### 5.3.12 Food influence insulin release

More than 88% of the participants believed that some foods could affect the release of insulin. Just 6% of the participants believed that food can affect insulin release.

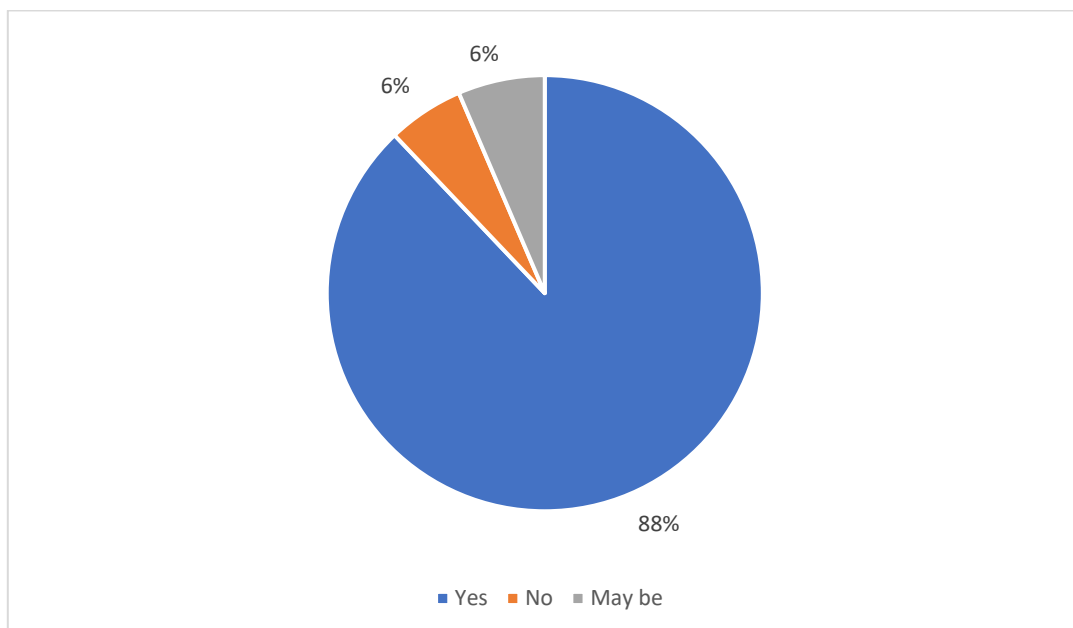


Figure 5.3.12: Food influence insulin release

### 5.3.13 Fiber containing foods

The most intriguing finding was that 43% of the patients had no idea that foods high in fiber can lower blood sugar levels. Just 25% of the patients are aware of it.

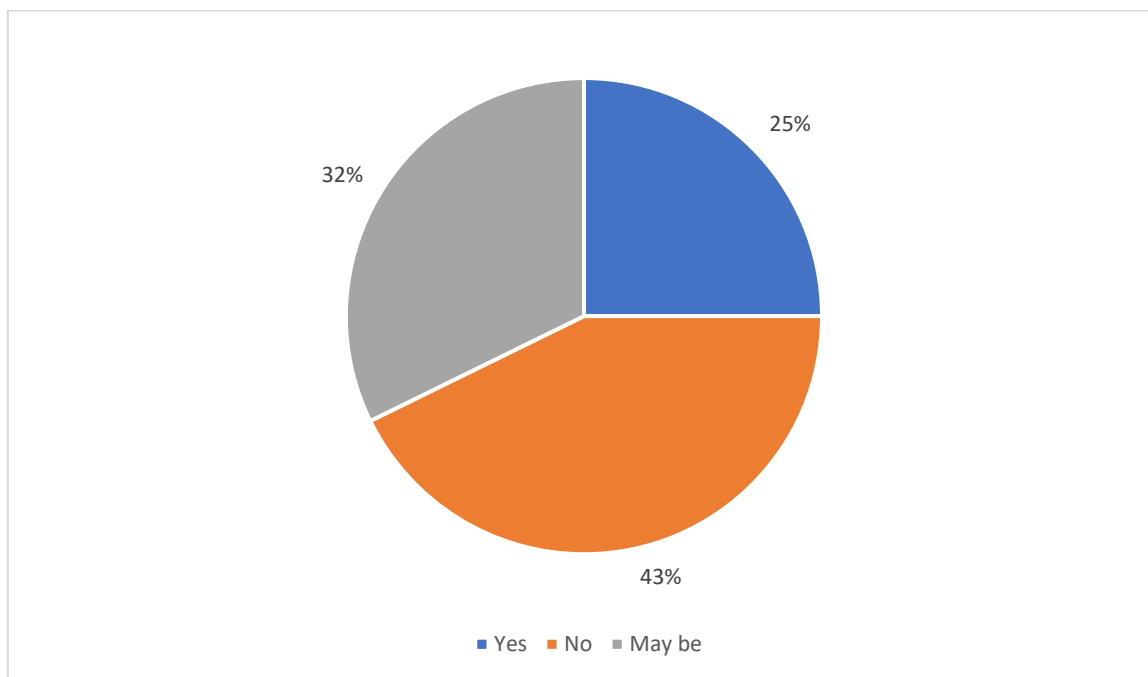
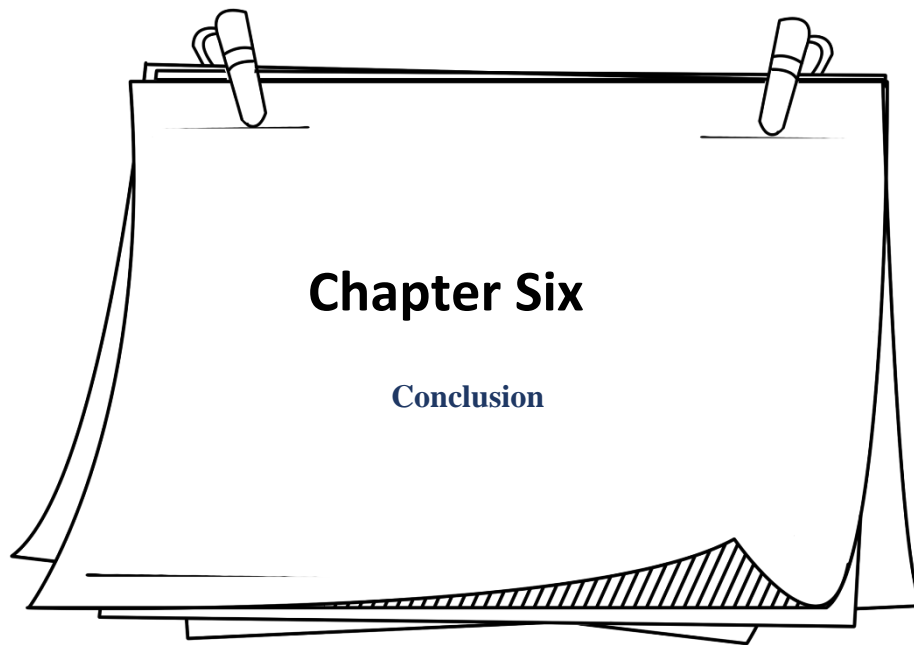


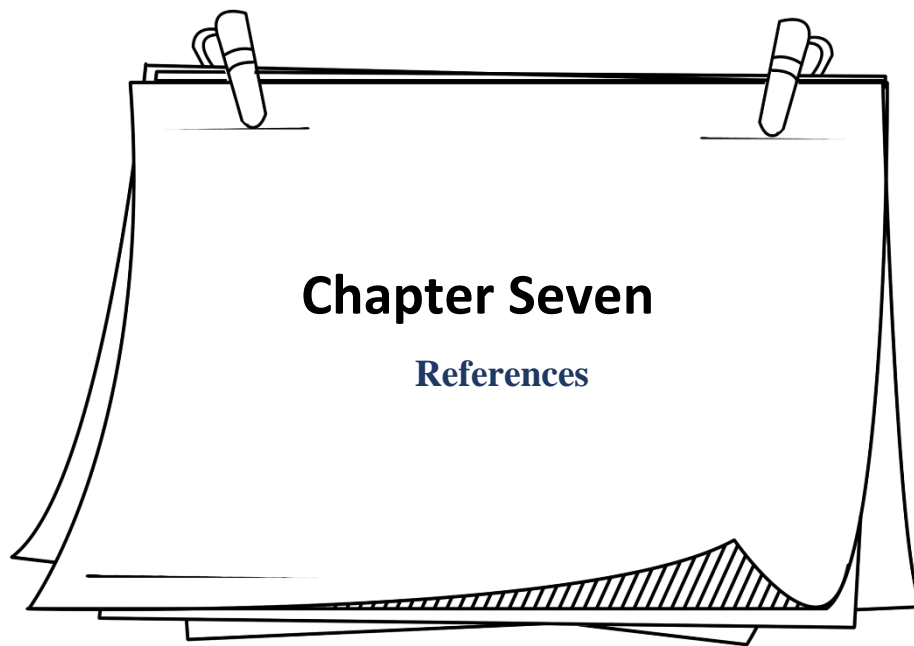
Figure 14: Fiber containing foods



## **6. Conclusion**

This particular study made it possible to analyze the diabetic patient's food habits in great detail. The goal of this study is to get the Bangladesh Diabetic Association to pay particular attention to the diet and way of life of diabetics there.

This study reveals that the majority of the patients lived in urban areas and they were 50 and above age, the majority were retired. The prevalence of diabetes was most common in males. This study showed that the diabetes patients in the area were mostly fond of eating rice. A high percentage of the patients have shown lack of interest to lessen the carbohydrates from their daily meals. In this study, 39% of the patients kept their protein, fat, and carbohydrate ratios at 2:4:4. Besides, 36% never showed interest in fewer carbs practices. Maximum patients thought local food have some beneficial effect on diabetes. More than half patients continued eating high sugar-containing food. Only one-fourth of the patients have shown interest in the keto diet. Almost 73% of the patients expressed little interest in water fasting. The most surprising result was that 43% of the patients were unaware that eating meals high in fibre can lower blood sugar levels. Maximum participants of this study were unaware of diabetes disease. A big number of patients totally unaware the local food and food habit. This type of study will help the Diabetic association for conducting Diabetes Prevention Programme (DPP) and awareness programme.



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