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Assessment of Type 2 Diabetic Patients at BIRDEM

General Hospital

A Project Report By

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Submitted to the Department of Nutrition and Food Engineering in the partial fulfillment
of

B.Sc. in Nutrition and Food Engineering

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APPROVAL

This project “**Nutritional Management of Type-2 Diabetic Patients at BIRDEM General Hospital**” submitted by **Fatema Akter** bearing **ID:191-34-171** to the Department of Nutrition and Food Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Nutrition and Food Engineering and approved as to its style and contents. The presentation has been held on 4 April 2023.

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DECLARATION

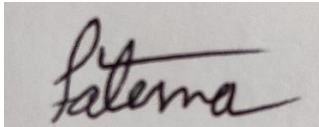
We hereby declare that, this project has been done by us under the supervision of **MS. Arifa Sultana, Lecturer, Department of NFE**, Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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ABSTRACT

In order to understand the nutritional management and health impacts of type-2 diabetic patients admitted to BIRDEM General Hospital with diverse concomitant health conditions, a study was created. Data from 60 patients were gathered by the institution. A questionnaire with questions about socioeconomic status, family history, food habits, and biochemical data was created. BMI calculations and anthropometric measures were used to determine nutritional status. Dietary consumption was calculated based on the subjects' typical eating patterns. Results showed that 72% of patients had heart complications, 43% of patients had chronic kidney disease (CKD), 43% of patients had hypertension, 32% of patients were between the ages of 56 and 65, 50% of patients had a history of hospitalization, 19% of patients had retinopathy, 43% of patients were overweight by BMI, and 22% of patients had a history of stroke. 60% of the patients were women, 47% of whom were housewives, and 70% of them were from middle-class backgrounds. 20% of the patients were illiterate.

TABLE OF CONTENTS

CONTENTS	PAGE
Approval	i
Declaration	ii
Acknowledgements	iii
Abstract	iv
CHAPTER	
CHAPTER 1: INTRODUCTION	1
CHAPTER 2: LITERATURE REVIEW	2-3
2. Literature Review	2-3
CHAPTER 3: MATERIALS AND METHODS	4-5
3.1 Anthropometric Assessment	4
3.2 Clinical Assessment	4
3.3 Biochemical Assessment	4
3.4 Demographic and Socioeconomic Data	4
3.5 Dietary Assessment	5
3.6 Analysis of Data	5
CHAPTER 4: RESULTS AND DISCUSSION	6-10
4. Result and Discussion	6-10
CHAPTER 5: CONCLUSION	11
APPENDIX	12
REFERENCES	13

LIST OF FIGURES

FIGURES	PAGE NO.
Figure 1: Age groups percentages of Type 2 Diabetic patients	6
Figure 2: The occupations of Type 2 Diabetic patients	7
Figure 3: The Living Status of Type 2 Diabetic patients.	8
Figure 4: Blood Pressure of Type 2 Diabetic patients.	9

LIST OF TABLES

TABLES	PAGE NO.
Table 1: Differences between Type 1 & Type 2 Diabetes.	2
Table 2: The Age groups of Type 2 Diabetic patients.	6
Table 3: Education Level of Type 2 Diabetic patients.	7
Table 4: Occupations of Type 2 Diabetic patients.	7
Table 5: Gender frequency and percentages Of Patients.	8
Table 6: Living status of Type 2 Diabetic patients.	8
Table 7: Health complications percentages of Type 2 Diabetic patients.	9
Table 8: BMI Frequency and percentages of Patients.	10
Table A1: Family history, Food habits & other lifestyle habits percentages.	12

Chapter 1

Introduction

Diabetes type 2 is a diverse illness. Genetic and environmental variables are both necessary for the condition to manifest clinically (Kirti Kaul, 30 December 2012). The persistent metabolic condition Diabetes mellitus is a rapidly spreading global issue with serious social, health, and economic ramifications (Lebovitz, 01 August 1999). Which causes an increase in blood sugar more than usual (Lebovitz, 01 August 1999). The two main causes of the rise are aging and obesity (Lebovitz, 01 August 1999). The various types of diabetes and its associated sequelae, including immune system dysfunction, periodontal disease, retinopathy, nephropathy, somatic and autonomic neuropathy, cardiovascular disorders, and diabetic foot. Additionally included are emerging therapeutics, existing management, and treatments (Lebovitz, 01 August 1999).

More than 90% of diabetes patients have type 2 diabetes, which causes microvascular and macrovascular problems that are extremely distressing for patients and caregivers alike and place a significant financial burden on health-care systems (Sudesna Chatterjee, 3–9 June 2017).

In type 2 diabetes, however, the body's cells gradually lose their capacity to absorb and utilize the insulin, despite the pancreas producing it (Monika Gruesser, et al., SEPTEMBER 01 1993).

In the next 20 years, it is expected that the prevalence of diabetes in adults of which type 2 DM is becoming more prevalent will rise (Abdulfatai B. Olokoba, 2012 Jul; 27(4)). A large portion of this rise will take place in emerging nations, where the majority of patients are between the ages of 45 and 64 (Abdulfatai B. Olokoba, 2012 Jul; 27(4)). According to projections, the latter will eventually equal or perhaps surpass the former in emerging countries, resulting in a twofold burden due to the ongoing shift from infectious to non-communicable diseases (Abdulfatai B. Olokoba, 2012 Jul; 27(4)).

Adult women aged 55 to 64 are a significant risk category. Obesity rates in this group surpass 70%. Numerous genetic and dietary theories explain this trend. We discovered that diabetes patients had significant rates of hospitalization for both micro and macrovascular problems (Abdulfatai B. Olokoba, 2012 Jul; 27(4)).

Chapter 2

Literature Review

The literature on type 2 diabetes mellitus' traits and effects has been published, according to this review of the literature. A major health concern is type 2 diabetes (Yulia Treister-Goltzman, 2015 Feb 15).

Type 1 and type 2 diabetes are the two major subtypes (Christopher A. Newton & Philip Raskin, 2004). Both kinds of diabetes are degenerative conditions that interfere with how the body manages glucose or blood sugar levels (Christopher A. Newton & Philip Raskin, 2004). The fuel that powers your body's cells is glucose, but it requires a pass to access your cells. The solution is insulin (Christopher A. Newton & Philip Raskin, 2004). Diabetes type 1 patients don't make insulin (Christopher A. Newton & Philip Raskin, 2004). You could compare it to being without a key (Christopher A. Newton & Philip Raskin, 2004). People with type 2 diabetes often don't produce enough insulin later in the disease and don't react to insulin as well as they should. It is comparable to having a damaged key (Christopher A. Newton & Philip Raskin, 2004).

Table-1. Differences between type 1 and type 2 Diabetes.

	Type 1	Type 2
Risk factors	The exact etiology of type 1 diabetes is unknown at this time.	We are aware that certain factors, such as weight and ethnicity, increase the chance of developing type 2.
Symptoms	Type 1 signs manifest more rapidly. Signs are Bed-wetting in children, more thirst, urinating a lot, irritability and mood swings, tired and weakness, blurry vision etc.	they manifest more gradually; type 2 signs may be simpler to overlook. Signs are like fatigue, thirst, hunger, irritability, dizziness, blurry vision, frequent urination, weight loss etc.
Management	In order to handle type 1, must take insulin to regulate the patient's blood sugar.	Type 2 diabetes is more manageable than type 1 in many respects. These include using medicine, physical activity, and diet. Insulin can also be given for people with type 2.

Type-2 DM, a complex illness, is regarded as a global concern due to its rising prevalence and detrimental effects on patients' quality of life (Arrigoni, 2022). Even though it is well recognized that self-care is important for achieving ideal results and that males and females use different self-care behaviors, sex-related differences in T2DM patients' self-care have received little research (Arrigoni, 2022). In particular, there hasn't yet been a comprehensive analysis of the current evidence. As a result, the objective of this study is to summarize, critically evaluate, and interpret the information that is currently available regarding the sex-related variations in the self-care practices of T2DM patients (Arrigoni, 2022).

There are numerous more comorbidities that worsen diabetes' impact on a patient's life. The most prevalent of them are arthritis, obesity, hypertension, dyslipidemia, and hypertension. The relationship between diabetes and depression, as well as in certain cases the development of dementia, is the most fascinating area of study (Aikaterini Trikkalinou, 2017 Apr 15).

Maintaining one's health if one has type 2 diabetes Maintaining an active lifestyle and eating well will help control blood sugar levels. The patient's weight will be under control, and they'll feel better all around (Ebenezer A. Nyenwe, 2011 Jan). Type 2 diabetes is treated and managed by: eating right, exercising frequently, Loss of weight, possibly insulin treatment or diabetes medication, tracking blood sugar levels (Hope S. Warshaw, MAY 01 1993) .

They can consume a variety of foods. Patients with type 2 diabetes are able to consume everything, but there are several items they must avoid. should consume a variety of foods, such as fruits, vegetables, and some carbohydrates like pasta, limit intake of salt, fat, and sugar. every day, eat breakfast, lunch, and dinner and not skipping meals (J Mann (Convenor), 01 April 2000) .

Blood sugar levels can be lowered through physical activity. The recommended weekly activity goal for patients is 2.5 hours. They can work out anywhere as long as it causes them to become out of breath. This may be brisk walking, climbing stairs, harder cleaning, or gardening (Marion J. Franz, September/October 2002).

Chapter 3

Materials And Methods

The present study was conducted on a convenient sample of people in all wards located in BIRDEM General Hospital. Data was collected on a developed questionnaire. And that information was collected from personal interviews, hospital records and from patient's attendants.

3.1 Anthropometric Assessment

We measured weight and height using the authorized WHO anthropometric techniques (WHO, 1995). A weighing scale was used to calculate body weight in kilograms. With the aid of a measuring tape, height was measured in millimeters. Body mass index (BMI) was calculated by dividing weight in kilograms by height in meters squared ($Wt (kg) / Ht (m)^2$). BMI classification of body mass index (BMI) was used to determine nutritional condition of (WHO, 2005). BMI 18.5 was used to classify respondents as underweight, BMI >18.5-24.9 as normal weight, BMI 25-29.9 as overweight, BMI > 30 as obese, and BMI > 40 as morbidly obese (Maurizio De Luca, 2016 Aug).

3.2 Clinical Assessment

Each patient was interrogated for the clinical assessment during the physical examination by the consultants and the major complaints and related comorbidities were noted on the questionnaire.

3.3 Biochemical Assessment

About 8 ml blood sample was taken from each patient for the determination of blood glucose, serum electrolytes (sodium, potassium, chloride), kidney profile (creatinine, blood urea), cardiac profile (Troponin-1) and also those results were collected in the questionnaire.

3.4 Demographic and Socioeconomic Data

Through interviews, information on their socioeconomic position, including occupation, marital status, education, family size, type, and monthly family income, was gathered. The questionnaire was updated with the responses.

3.5 Dietary Assessment

Took each patient interview about their daily food habits and beverages. The responses were collected in the questionnaire.

3.6 Analysis of Data

All the data were compiled from the questionnaire and set into the Microsoft excel version 2016 and then analyzed in SPSS-20 for percentages.

Chapter 4

Results And Discussions

A hospital-based study was conducted on 60 hospitalized patients with type-2 diabetes diseases without any age limitations. Those cases data were included regarding the respondent's personal, socioeconomic, demographic, anthropometric, clinical, biochemical, and food consumption information was gathered. Age, anthropometry, dietary habits, education, gender, hypertension, physical activity, smoking, and diabetes were all assessed as potential risk factors for cardiovascular disease.

Table-2, Figure-1 represents the Age group of type-2 diabetic patients. The majority of the patients suffered from type-2 diabetes at the age of 56-65 years peoples which are 32%. Then 28% were 46-55 years old. 18% of them were 35-45 years. 17% of them were 66-75 years and 5% were 76-85 years old.

Table-2. Age Group of type-2 diabetic patients.

Age group	Frequency	Percentage (%)
35-45	11	18%
46-55	17	28%
56-65	19	32%
66-75	10	17%
76-85	3	5%
Total	60 peoples	100%

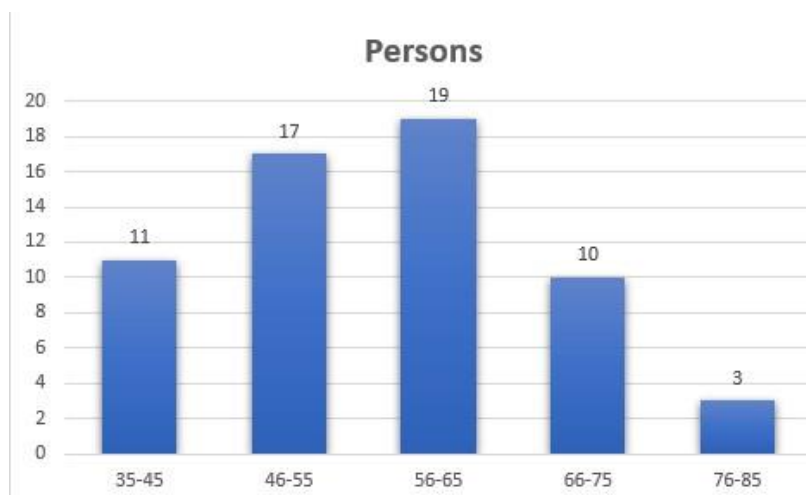


Figure 1. Age group of type-2 diabetic patients.

The Educational status of type-2 diabetic patients is presented in Table-3. There it is clear that the majority of the patients are 30% whom are either secondary or below secondary educated. The second higher percentage is 22% with Higher study. None-educated are 20% , 15% of Higher secondary educated and 13% are below or 5th standard.

Table-3. Education Level of Type 2 Diabetic patients.

Education	Frequency	Percentages (%)
≤5	8	13%
≤SSC	18	30%
HSC	9	15%
Higher Study	13	22%
None	12	20%
Total	60	100%

Table-4 and Figure-2 presenting the occupations of the patients. The most important information found here that the majority of patients are Housewife with 47% percentage. Then Job Holders are 14%, Businessmen 6% and 20% are Heavy Workers.

Table-4. Occupations of Type 2 Diabetic patients.

Occupations	Frequency	Percentages (%)
Housewife	28	47%
Job Holder	14	23%
Business	6	10%
Heavy Worker	12	20%
Total	60	100%

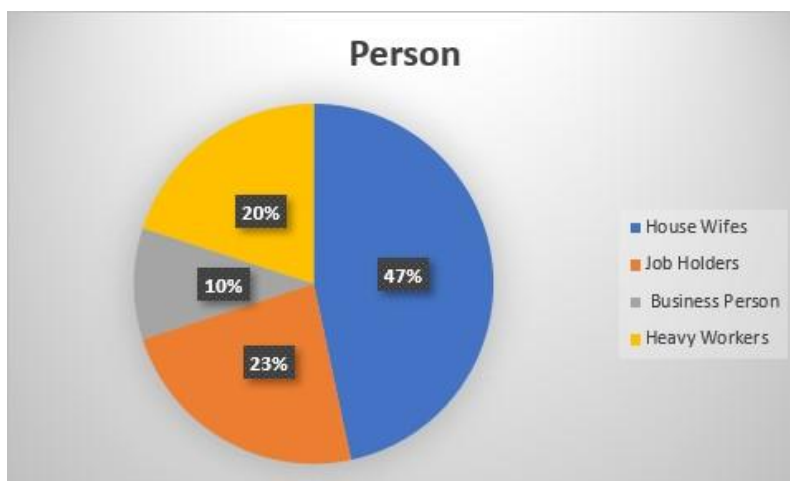


Figure-2. The Occupations of Type 2 Diabetic patients.

Table-5 represents that the Gender percentage of patients. There are 24 people which means 40% of Male and 36 peoples or 60% female patients in the 100%.

Table-5. Gender frequency and percentage of the Patients.

Gender	Frequency	Percentage (%)
Male	24	40%
Female	36	60%
Total	60	100%

Table-6 presenting the Living Status of the 60 peoples. There the majority of peoples are from middle-class as percentage of 70%. 17% Of Upper class and 13% are Lower class people.

Table-6. Living Status of Type 2 Diabetic patients.

Living Status	Frequency	Percentage (%)
Lower Class	8	13%
Middle Class	42	70%
Upper Class	10	17%

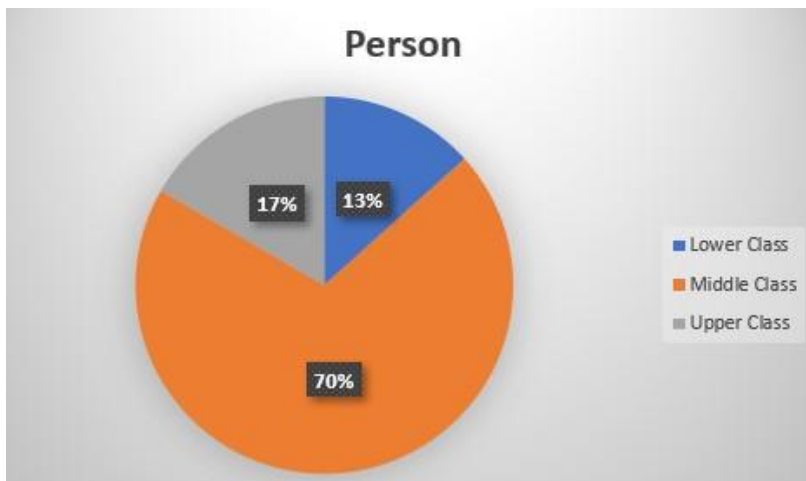


Figure-3. Living Status of Type 2 Diabetic Patients.

Figure-4. Presenting the Blood Pressure groups of 60 patients. 61.67% of them are in G-2 HTN. 23.33% have Normal BP (Blood pressure), 21.67% patients have G-1 HTN. And 15% patients are developed Elevated BP.

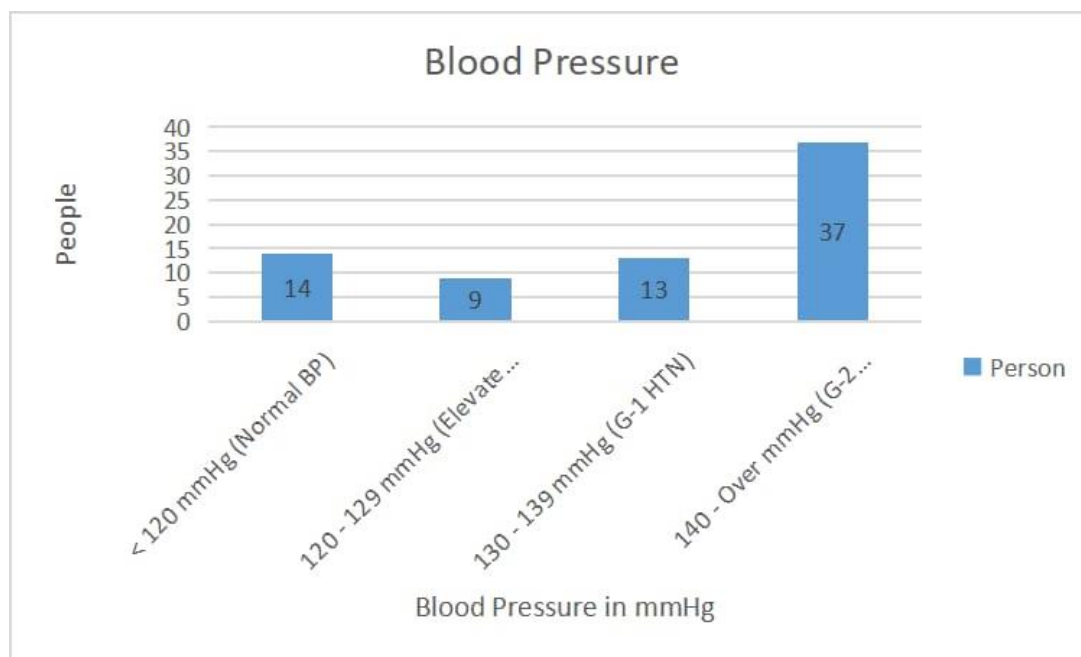


Figure-4. Blood Pressure of Type-2 Diabetic Patients.

History of hospitalization, Heart complications percentages, chronic kidney diseases percentage, Retinopathy, Hypertensive and History of stroke percentages are presented in the Table-7. 83% of patients have history of previous hospitalization and 17% not. 72% of them are suffering from heart complications and 28% are not having. 43% of them are have CKD, on the other hand 57% are well. 29% patients have eye complications and other 71% with no eye complications. 47% of patients are hypertensive and 53% are non-hypertensive. There are 22% of them have history of stroke and 78% are well.

Table-7. Health complications percentages of Type 2 Diabetic Patients.

Name of Complication	Yes (Percentage%)	No (Percentage%)
History of Hospitalization	50 (83%)	10 (17%)
Heart Complications	43 (72%)	17 (28%)
Chronic Kidney Diseases	26 (43%)	34 (57%)
Retinopathy	19 (29%)	47 (71%)
Hypertensive	41 (47%)	47 (53%)
History of Stroke	13 (22%)	47 (78%)

Table-8. Showing the BMI Rates of the patients. Where majority percentage are overweighted (43.33%). 41.67% are Normal ,11.67% are Obese Class 1 and 3.33% are at Obese class 2.

Table-8. BMI Frequency and Percentages of patients.

Stages	Frequency	Percentage (%)
Normal (18.5-24.9)	25 (10 Female)	41.67%
Overweight (25.0-29.9)	26 (19 Female)	43.33%
Obese class 1 (30.0-34.9)	7 (5 Female)	11.67%
Obese class 2 (35.0-39.9)	2 Female	3.33%
Total	60	100%

Discussion:

Breakfast should consist of 2 breads (60g each), 1 egg, and 1 serving of cooked vegetables for the patient's usual eating habits.

For lunch, we should serve them two cups of rice, one piece of fish or poultry (60g), along with a serving of steamed vegetables and a salad.

For dinner, we can serve them two 60g breads, one 60g piece of fish or chicken, one serving of vegetables, and a side salad.

We should give them 30g of milk each time with refreshments in the mid-morning and afternoon.

Aim for a 50% carbohydrate consumption, 20% protein, and no more than 30% fat. A type 2 diabetic patient is permitted 1500–1800 kcal per day. They should therefore uphold these standards.

Chapter 5

Conclusion

According to the study's findings, individuals had greater rates of diabetes and hypertension, which raised their chance of developing cardiovascular disease (CVD). The majority of the patients had a risk of being overweight. Most patients were admitted to the hospital between the ages of 56 and 65. Most of the patients led mostly sedentary lifestyles. The majority of the patients were from middle class family living and housewives with a history of being admitted to hospitals. A metabolic condition called type 2 diabetes mellitus can be avoided by altering one's lifestyle, controlling one's nutrition, and reducing overweight and obesity. The public's education remains crucial to the management of this new epidemic. Despite increasing knowledge of the disease's pathogenesis and the development of novel medications, there is no cure for the illness in sight. To enhance the quality of life for those with type 2 DM, management should be individualized.

APPENDIX A: Family history, Food Habit and Other Lifestyle Habits.

The family records of patients, Food Frequency habits and other lifestyle habits are presented in the Table-9. 21.6% patients have previous family DM records. 41.6% peoples being use insulin, 51.67% peoples maintain their sugar level on the other hand 48.33% are not. 55% of patients suffer from body weakness in their daily life, 73% monitoring their blood sugar levels of them but 27% don't. 26.67% have smoking habit, 55% have fruits and vegetables in their daily intake. 20% are protein restricted to their diet, 30% patients have high carbohydrate and fatty foods in daily life. And only 45% of patients continuing regular exercise other 55% are not aware of it.

Table-A1. Family history, Food Habit and Other Lifestyle Habits.

Variables	Yes (%)	No (%)
Family Record of DM	13 (21.67%)	47 (78.33%)
Insulin Habit	25 (41.67%)	35 (58.33%)
Maintained Sugar	31 (51.67%)	29 (48.33%)
Weakness	33 (55%)	27 (45%)
Regular sugar level Monitored	44 (73%)	16 (27%)
Smoking Habit	16 (26.67%)	44 (73.33%)
Daily fruits and Vegetables intake	33 (55%)	27 (45%)
Protein Restricted	12 (20%)	48 (80%)
High Carbs and Fatty food intake Habit	18 (30%)	42 (70%)
Exercise Habit	27 (45%)	33 (55%)

REFERENCE

- Abdulfatai B. Olokoba, O. A. O. a. L. B. O., 2012 Jul; 27(4). Type 2 Diabetes Mellitus: A Review of Current Trends. *Oman Med J.*, p. 269–273.
- Aikaterini Trikkalinou, A. K. P. a. A. M., 2017 Apr 15. Type 2 diabetes and quality of life. *World J Diabetes.*, p. 120–129.
- Arrigoni, I. B. R. C. F. D. D. A. S. B. I. V. S. R. A. M. G. C. L. G. C., 2022. Self-care and type 2 diabetes mellitus (T2DM): a literature review in sex-related differences. *Acta Biomedica*, p. 2.
- Christopher A. Newton, M. & Philip Raskin, M., 2004. Diabetic Ketoacidosis in Type 1 and Type 2 Diabetes Mellitus Clinical and Biochemical Differences. *Arch Intern Med*, pp. 164(17):1925-1931.
- Ebenezer A. Nyenwe, T. W. J. [a. A. E. K., 2011 Jan. Management of type 2 diabetes: evolving strategies for the treatment of patients with type 2 diabetes. *PMC*, p. 60(1): 1–23.
- Hope S. Warshaw, H. W., MAY 01 1993. Nutrition Management of Diabetes Must be Individualized. *Diabetes Care*, p. 16(5):843–844.
- J Mann (Convenor), M. L. M. T. G. S. M. U. a. B. V. (. o. t. S. G., 01 April 2000. The Diabetes and Nutrition Study Group (DNSG) of the European Association for the Study of Diabetes (EASD) 1999. *European Journal of Clinical Nutrition*, p. 353–355 (2000).
- Kirti Kaul, J. M. T. S. I. A. E. M. K. & R. C., 30 December 2012. Introduction to Diabetes Mellitus. *Springer, New York, NY*, p. 1–11.
- Lebovitz, H. E., 01 August 1999. Type 2 Diabetes: An Overview. *Clinical Chemistry*, p. 1339–1345.
- Marion J. Franz, M. R. L. O. a. a. a. a., September/October 2002. 2002 Diabetes Nutrition Recommendations: Grading the Evidence. *SAGE Journals*, p. 756.
- Maurizio De Luca, 1. L. A. J. H. L. B. N. S. R. W. A. S. C. S. M. L. A. G. B. H. B. J. D. S. C. H.-C. K., 2016 Aug. Indications for Surgery for Obesity and Weight-Related Diseases: Position Statements from the International Federation for the Surgery of Obesity and Metabolic Disorders (IFSO). *PMC*, p. 1659–1696.
- Monika Gruesser, M. et al., SEPTEMBER 01 1993. Evaluation of a Structured Treatment and Teaching Program for Non-Insulin-Treated Type II Diabetic Outpatients in Germany After the Nationwide Introduction of Reimbursement Policy for Physicians. *Diabetes Care* 1, p. 1268–1275.
- Sudesna Chatterjee, K. K. M. J. D., 3–9 June 2017. Type 2 diabetes. *The Lancet*, pp. 2239-2251.
- Yulia Treister-Goltzman, R. P., 2015 Feb 15. Literature review of type 2 diabetes mellitus among minority Muslim populations in Israel. *World J Diabetes.*, p. 192–199.