



**An Internship Report**  
**on**  
**Diabetes Complications Nutritional Management at BIRDEM General**  
**Hospital**

**BY**  
**Tania Islam**  
**ID: 191-34-838**

Submitted To the Department of Nutrition and Food Engineering in the partial fulfillment  
of  
B.Sc. in Nutrition and Food Engineering

Supervised by  
**Mr. Md. Nawal Sarwer**  
Lecturer  
Department of NFE

**FACULTY OF ALLIED HEALTH SCIENCE (FAHS)**  
**DAFFODIL INTERNATIONAL UNIVERSITY**

## **APPROVAL**

This project titled **Diabetes Complications Nutritional Management at BIRDEM General Hospital** Submitted by **Tania Islam** 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.

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**Departmental Head**  
**Dr. Nizam Uddin**  
**Associate Professor & Head**  
Department of NFE  
Faculty of Allied Health Science  
Daffodil International University

## DECLARATION

We hereby declare that, this project has been done by us under supervisor of **Mr. Md. Nawal Sarwer, 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

**Supervised by:**



**Mr. Md. Nawal Sarwer**  
Lecturer  
Department of NFE  
Daffodil International University

**Submitted by:**



**Tania Islam**  
ID:191-34-838  
Department of NFE  
Daffodil International University

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Finally, I must acknowledge with due respect the constant support and patients of our parents.

## **ABSTRACT**

Institute of Research and Rehabilitation in Diabetes, Endocrine, and Metabolic Disorders" in Bangladesh", which is situated at, Dhaka, operates with the capacity of 600 beds multidisciplinary medical institution complex, overseen by the 'Diabetic Association of Bangladesh'. In 1956, diabetes was initially perceived as an ailment afflicting the affluent, but it swiftly transformed into a global epidemic, particularly impacting underdeveloped and emerging nations. The BIRDEM outpatient department (OPD) admits 3,000 patients daily, making it the foremost facility in Bangladesh for diabetic patient care. BIRDEM General Hospital employs a range of treatments to manage diabetes, emphasizing the significance of a healthy diet as well as manage to bottom down the sugar level of human blood. Nutrition education and counseling play a vital role in guiding patients toward informed decisions. Regular 'foot examinations' and interventions are crucial for averting diabetes-related complications. Addressing kidney disease, nerve damage, vision issues, and heart ailments requires tailored therapeutic approaches. A diabetic-friendly diet focuses on stabilizing the sugar level of blood by regulating the intake of proteins, carbohydrates, and fats, aiming to mitigate the possibilities of complications like heart problems, kidney impairment, and damages of nerve.

## TABLE OF CONTENT

| <b>CONTENT</b>                             | <b>PAGE</b> |
|--------------------------------------------|-------------|
| Approval                                   | ii          |
| Declaration                                | iii         |
| Acknowledgement                            | iv          |
| Abstract                                   | v           |
| <br><b>CHAPTER 1:</b>                      |             |
| 1.1 Introduction                           | 1           |
| 1.2 Report origin                          | 2           |
| 1.3 Internship Objective                   | 2           |
| <br><b>CHAPTER 2:</b>                      |             |
| 2.1 Birdem Overview                        | 3           |
| 2.2 Vision                                 | 3           |
| 2.3 Mission                                | 3-4         |
| 2.4 Facilities & Services                  | 4           |
| <br><b>CHAPTER 3:</b>                      |             |
| 3.1 Patient Management                     | 5           |
| 3.2 Particular Objectives                  | 5           |
| 3.3 Diagram Flow                           | 6           |
| <br><b>CHAPTER 4:</b>                      |             |
| 4.1 Study Subjects                         | 7           |
| 4.2 Diabetes                               | 7-9         |
| 4.3 Nutrition Support (Enteral & Parental) | 9-10        |
| 4.4 'Chronic Kidney Disease' (CKD)         | 10-11       |
| 4.5 Obesity                                | 12-13       |
| <br><b>CHAPTER 6:</b>                      |             |
| 6.1 My opinion about the diet chart        | 26          |
| <br><b>CHAPTER 7:</b>                      |             |
| 7.1 Conclusion                             | 27          |

## CHAPTER 1

### 1.1 INTRODUCTION

The area of nutrition research known as "clinical nutrition" focuses on disorders brought on by abnormalities in metabolism or dietary deficiencies. This comprises healthcare facilities like clinics and hospitals, where patients and their families can receive treatment for a range of illnesses, including dietary therapy.

An array of contemporary health issues, including but not limited to diabetes, obesity, renal failure, and liver illnesses such as cirrhosis and hepatitis, are directly associated with poor eating habits or a long-term absence of healthy eating patterns. Preventing such problems can be greatly aided by eating a healthy diet.

Parallel to this, our brains depend on the continuous flow of glucose from the bloodstream. The pancreatic hormone insulin helps cells absorb glucose and use it as fuel. But sometimes the body either produces too little insulin or uses it incorrectly. As per the Global Health Days report by the World Health Organization, 422 million individuals globally were diagnosed with diabetes in 2016, and over 80% of diabetes-related deaths occur in low- and middle-income countries. In 2016, 12.8% of Bangladeshis had diabetes, making up 3% of the population.

Numerous problems that result from diabetes have the potential to drastically reduce a person's quality of life. Consequences can arise from either poorly controlled blood sugar levels or long-term disease progression. However, these issues may be successfully managed with the correct medication, dietary adjustments, consistent exercise, and glucose management.

I deliberately chose to do a short but intensive internship at BIRDEM Hospital because of its distinguished reputation as Bangladesh's foremost authority in clinical nutrition and dietetics.

## **1.2 Report origin:**

The internship requirement for students pursuing a BSc in NFE at DIU is very important because it marks the conclusion of our academic journey. Thanks to this internship program, which allows us to gain practical experience and learn more about the subjects we have studied in school, we have a bright future.

Choosing a respectable hospital or industry-related facility for our internship is essential for us as nutrition and food engineering students. Making this decision is crucial to gaining practical experience and information that will enhance our theoretical research and academic education. I have selected BIRDEM General Hospital as the location for my internship with this goal in mind. I've always been interested in the hospital sector, and I think this program will help me close the gap between academic understanding and practical application in the subject of modern nutritional health.

This report's main goal is to examine the hospital's approach to treating diabetic patients and the related dietary issues. My goal in examining the hospital's procedures is to get knowledge that will help to improve future nutritional management treatment.

## **1.3 INTERNSHIP OBJECTIVES**

My main objective is to fulfill all departmental criteria, requirements and earn a bachelor's degree. The principal motivation for my selection of this university is my intense desire to become a doctor. This academic endeavor is helping me to strengthen my educational foundation and move closer to my eventual aim of becoming a hospital employee.

This internship initiative's main goal is to give students practical experience in the fields of nutrition planning and disease management. These aspects are critical to making sure patients receive healthy meals and appropriate nutritional assistance, and they also fit in perfectly with the prerequisites for the NFE BSc program. By actively engaging in this internship, I hope to close the knowledge gap between theory and practice, which will improve my general competency in the field.

## **CHAPTER 2**

### **2.1 BIRDEM OVERVIEW**

BIRDEM, is one of the most well-known private hospitals in Bangladesh that specializes in treating diabetes. It was established in 1980 by Dr. Mohammad Ibrahim, and since then, it has grown to become one of the greatest hospitals in the nation.

Initially concentrating solely on diabetes care, BIRDEM, a Dhaka-based organization, currently provides a greater variety of services to patients with various specializations. With more than 3,000 patients seen daily in its outpatient division, the hospital functions as Bangladesh's main diabetes patient care facility.

Professor Dr. Mohammad Ibrahim created BIRDEM, an organization that has proven invaluable in providing diabetes patients with the healthcare they need. Preceding the establishment of the organization, in 1956, was the Diabetic Association of Pakistan, which subsequently evolved into the Diabetic Association of Bangladesh (BADAS). BIRDEM-2 was created in 2012 to debunk the misconception that diabetes primarily affects the rich. The BIRDEM Academy was founded in 1986 and offers thorough education and training. In addition to offering graduate-level training in a range of medical disciplines, The Academy is essential to Bangladesh's healthcare professionals' advancement.

### **2.2 VISION**

- " In Bangladesh, no diabetic needs to pass away without access to food, healthcare, or employment."
- "Everybody should have access to affordable medical care."

## **2.3 MISSION**

- Through the numerous facilities of the Diabetic Association of Bangladesh, all individuals with diabetes, regardless of gender, economic status, or social position, will receive comprehensive medical care, including rehabilitation.
- Compose a group of knowledgeable and experienced workers, such as scientists, doctors, dietitians, technicians, and support personnel, to improve and expand BADAS Health care to all Bangladeshis at reasonable costs. By putting in place a focused, open management structure and offering premium medications and medical supplies, you may promote leadership and excellence in the healthcare industry.
- Regardless of gender, social level, or other influencing variables, all diabetic patients should receive comprehensive medical care, including rehabilitation.
- Developing superior diet and medical supplies for all individuals with diabetes.

## **2.4 SERVICES AND FACILITIES**

Patients at BIRDEM General Hospital have access to a wide range of services and amenities. These are:

- OPD - Non-admitted patient clinic
- IS (Indoor Service) - Inpatient care
- GW (General Ward) - Standard ward
- Cabin - Private room
- ICU (Intensive Care Unit) - Critical care unit
- CCU (Coronary Care Unit) - Cardiac care unit
- HDU (High-dependency Unit) - Intermediate care unit
- OT (Operating Theater) / Post-Operative - Surgical suite / Recovery area
- ME (Medical Emergency) - Urgent medical care
- SE (Surgical Emergency) - Urgent surgical care
- Radiology and Imaging - Diagnostic imaging department
- Blood Bank - Hematology department

## **CHAPTER 3**

### **3.1 MANAGEMENT OF THE PATIENTS**

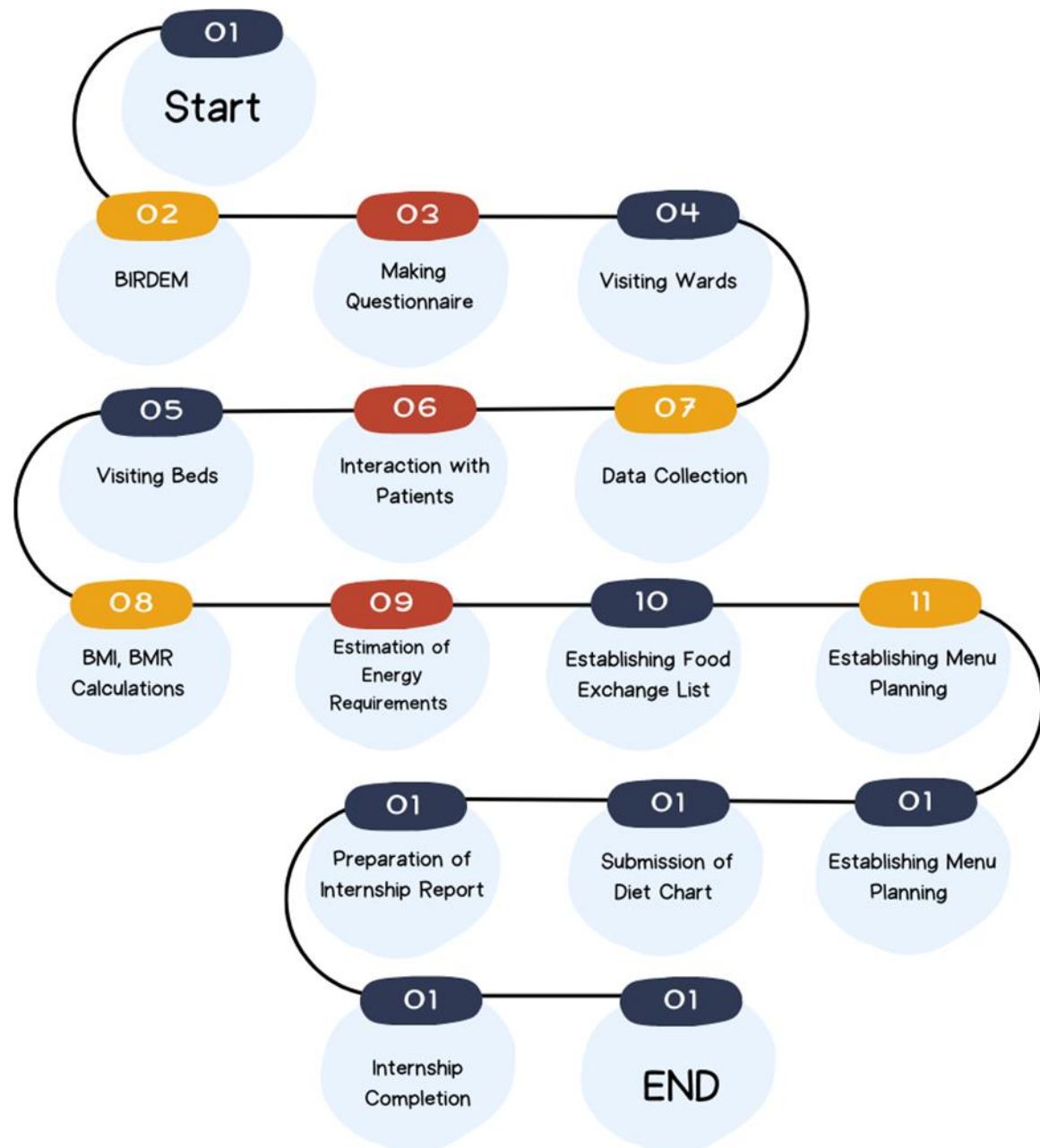
Patients from many backgrounds rely on the care provided by BIRDEM General Hospital. The kind ward nurses always gave the patients vital support throughout my visits. I arrived with individuals who were overseeing diabetes along with comorbid conditions such as CVD, CKD, infections of the foot and eyes, and other persistent ailments. Committed nutritionists made it possible to create customized meal plans and to provide wise nutritional advice based on the unique circumstances of each patient. The medical staff ensured the patients' well-being by performing regular examinations and filling medicines on time. Together, physicians, dietitians, and nurses gave the patients comprehensive and focused care during their stay.

### **3.2 PARTICULAR OBJECTIVES**

- To get comprehensive understanding of the operational facets of the healthcare industry.
- To improve comprehension of the complexities inside the healthcare system.
- To get a thorough comprehension of diabetes and the difficulties it presents.
- To increase understanding of dietary guidelines for the best possible nutrition.
- To acquire important knowledge about the methods physicians, use to manage their patients and their careful observation procedures.

### 3.3 FLOW DIAGRAM

The flowchart below provides an overview of this internship at BIRDEM General Hospital.



## CHAPTER 4

### 4.1 SUBJECTS OF STUDY

- During my internship, I have gained knowledge in the following areas:
- Managing and treating diabetes; comprehending enteral and parenteral nutrition;
- And having a thorough grasp of chronic kidney disease (CKD).
- Knowledge of breastfeeding and baby feeding techniques;
- Knowledge of nutritional concerns during pregnancy;
- Knowledge of obesity and methods to control it;
- Knowledge of the connection between nutrition and liver disease;
- Knowledge of managing arthritis and the value of maintaining bone health

### 4.2 DIABETES

Diabetes arises from abnormally elevated blood glucose, or blood sugar, levels. Glucose is our main energy source, which comes from the food we eat. The pancreas secretes the hormone insulin, which aids in the uptake of glucose into our cells for energy during meals. However, on sometimes, our bodies either don't create enough insulin or use it incorrectly. As such, glucose does not enter our cells; instead, it stays in the circulation.

**There are several forms of diabetes:**

- Type I Diabetes
- Type II Diabetes
- Gestational Diabetes

#### 4.2.1 Diabetes Type-I

Human are unable to make insulin because our immune system targets and destroys insulin-producing cells. Although it most frequently affects children and young people, type 1 diabetes can afflict anyone at any age. For the remainder of their lives, people with type 1 diabetes require daily insulin injections.

#### 4.2.2 Diabetes Type-II

Humans don't make or use insulin in large enough quantities. Type 2 diabetes primarily affects middle-aged and older individuals, while it can affect anyone at any age, including infants. The most common type of diabetes is this one.

#### **4.2.3 Gestational Diabetes**

Gestational diabetes can affect certain pregnant women, a transient illness that often goes away after birth. On the other hand, type 2 diabetes is more likely to strike women who have had gestational diabetes in later life. In certain cases, type 2 diabetes can develop during pregnancy.

#### **4.2.4 Blood Sugar for Diabetes (Test): FBS (Fasting Blood Glucose)**

Eight to fourteen hours must pass without eating before a diabetes test.. However, you are permitted to drink water throughout this fasting time. Eat 150g or more of carbohydrates (CHO) per day for three to four days before the test is also recommended.

If the result is more than 7, diabetes is considered to be present based on the interpretation of the test results. Diabetes is absent if the result is less than 6.1. 6.8 is considered insufficient fasting.

#### **OGTT (FBS + 2hr GT)**

Consume 75g of glucose after mixing it with 250ml of water. Get a blood test done two hours after eating. If the result is more than 11.1 it indicates the presence of diabetes. On the other hand, a 7.8 score suggests that things are going well.

#### **HbA1c**

If the measurement exceeds 6.5, it indicates ~~that the person has diabetes~~.

#### **Random**

~~In the event that the score exceeds 11.1, diabetes is present.~~ If the score is less than 6.1, diabetes is not identified. If the two middle results are the same, more testing is required to determine whether or not diabetes is present. Thus, for a patient with diabetes, first reviewing several report kinds. These reports are-

- Levels of Blood Sugar, providing insights into glucose regulation.

- HbA1C, which offers a longer-term perspective on blood glucose control.
- Lipid profile analysis to assess cholesterol and triglyceride levels.
- Blood pressure measurement to monitor cardiovascular health.
- Evaluation of kidney function to detect potential complications.
- Creatinine test, a crucial marker for kidney health.
- Electrolyte assessment, encompassing sodium (Na<sup>+</sup>), potassium (K<sup>+</sup>), calcium (Ca<sup>+</sup>), and others.

**Avoid:**

CHO, sugar, sugar substitutes, honey, Horlicks, cola, and soft drinks are examples of simple carbs. There have been added unsaturated fats, dietary fiber, and complex carbs. Extra nuts, olive oil, and fish oil are also suggested.

Next, manually set aside two hours for every meal. Additionally, keep track of the amount of food that is exchanged and consumed. For example, 30g of chapati is equal to ½ cup of rice.

Maintaining a balanced consumption of lipids, proteins, and carbohydrates (CHO) throughout the day is essential for kids with diabetes. In order to meet a child's nutritional needs, appropriate supplements, such iron pills, should be given if they are low in any particular nutrient, such as calcium or iron.

**A patient should aim to consume an extra 350 calories per day during the first, second, and third trimesters of pregnancy.**

#### **4.3 NUTRITION SUPPORT (ENTERAL AND PARENTERAL)**

Enteral and parental nutrition support are utilized when patients are unable to swallow oral feedings or fluids due to malnutrition or other circumstances. Patients who require assistance fulfilling their nutritional demands can now obtain essential nutrients thanks to these artificial feeding devices.

### 4.3.1 Enteral Nutrition

The method of giving nutrition to the gastrointestinal tract through feeding tubes and oral supplements is known as enteral feeding.

- **Nasogastric Tube:** A pipe inserted through the nose into the stomach for delivering nutrients.
- **Nasojejunal Tube:** Similar to a nasogastric tube but extends into the jejunum, bypassing the stomach.
- **Gastrostomy Tube:** A tube directly inserted into the stomach through the abdominal wall for feeding.
- **Jejunostomy Tube:** Similar to a gastrostomy tube but inserted into the jejunum

### 4.3.2 Parenteral Nutrition

Total parenteral nutrition (TPN) is a technique where liquids, carbohydrates, electrolytes, amino acids, vitamins, fats, and minerals are injected straight into a vein in place of the digestive tract.

Patients may use a supplement known as pelvic parenteral nutrition, or PPN, if they have access to another food source. The type of meals patients get or the precise amount of food delivered throughout the feeding process, however, is the most important aspect of enteral nutrition. Consequently, a patient's liquid meal is referred to as enteral feeding. A liquid diet can be made in three different ways:

- Natural drinks including milk, water, fruit juice, and green coconut water
- Food that has been blended and consumed in line with a standard diet. Food that is offered in stores as a formula.
- There are a few feeding rules to be aware of: ☐ The patient's state and illness must be appropriately reflected in the diet chart. Period of feeding: each two hours

## 4.4 Chronic Kidney Disease (CKD)

Chronic kidney disease (CKD) damages human kidneys, making them less effective at filtering blood as they should.

The following are the main risk factors for **kidney disease**:

- Individuals **with diabetes**
- **High blood pressure and heart conditions**
- Genetic predisposition to kidney failure

The signs of chronic kidney disease (CKD) may not appear until the kidneys are seriously damaged, and the condition frequently develops gradually.

When kidney failure is starting, one or more of the following signs may be present:

- Chronic cramps;
- Persistent itching
- Episodes of vomiting and nausea
- Irregular urine volume, either excessive or insufficient frequently accompanied by ankle and foot edema
- Breathing difficulties and sleep disorders
- Appetite loss

One or more of the following symptoms could be present if the kidneys quit functioning unexpectedly.

- Backpain
- Presence of fever
- Episodes of vomiting
- Development of a rash
- Abdominal discomfort
- Onset of nosebleeds

Diabetes and elevated blood pressure are the main causes of diabetic kidney disease (CKD). Maintaining control over and preventing these conditions requires limiting and avoiding unhealthy foods and beverages. A healthy lifestyle is crucial for preventing and managing high blood pressure, diabetes, and kidney disease.

For the patients (CKD) -

- Restriction of protein intake.
- Dialysis patients should maintain high protein levels.
- When dealing with heart issues, foods high in cholesterol should be avoided and carbohydrates and oil should be used in place of protein.
- Iron and calcium-rich vegetables are OK but not required, while diets high in protein are acceptable.

- Electrolyte balance should be maintained, and habits like smoking, consuming cigarettes, and alcohol should be avoided. Regular medical check-ups and strict adherence to the doctor's instructions are essential.

## **4.5 OBESITY**

Obesity, a disease that is detrimental to one's health, can result from being overweight or having an excessive amount of body fat. Metabolic syndrome, cancer, and arthritis are just a few of the problems that might strike someone who is overweight or obese. The metabolic syndrome includes heart disease, hypertension, and type 2 diabetes, which is frequently linked to obesity. As a result, obesity increases the risk of both these metabolic syndrome symptoms and other health issues.

Obesity and dehydration frequently go hand in hand. Drinking too little water can lead to low blood pressure and electrolyte imbalances, which can make you feel weak and lightheaded. As a result, people frequently overeat and occasionally have bad meals. As a result, maintaining a healthy amount of hydration is essential. Every day, aim to drink 1.5 to 3.5 L, or 6 to 14 glasses, of clean, clear water. You may also include hydrated choices like fresh fruit juice and green coconut water in your routine.

### **The primary and frequent causes of obesity are**

- Consuming more calories than expended through energy output
- Regular intake of high-calorie meals
- Elevated consumption of fatty and greasy foods
- Genetic predisposition based on family background
- Cessation of exercise, running, dancing, and outdoor activities
- Post-surgery treatments
- Excessive consumption or uncontrolled preference for fast food and deep-fried items
- Drug-induced obesity as a potential side effect.

Hormones that are responsible for obesity are two types-

- **Leptin hormone:** The fat cells in adipose tissue discharge leptin. Minimal consumption of food is caused by the long-term safety hormone's regulation of energy balance.
- **Ghrelin hormone:** Fast-eating hormone produced via the living stomach that increases hunger
- 

**Table-1: Classification**

| <b>Classification BMI</b> | <b>Kg/m<sup>2</sup></b> |
|---------------------------|-------------------------|
| Under weight              | 18.5                    |
| Normal                    | 18.5-24.9               |
| Overweight                | 25.0-29.9               |
| Obesity Class-I           | 30.0-34.9               |
| Obesity Class-II          | 35.0-39.9               |
| Extreme Obesity Class-III | 40.0                    |

#### **4.5.1 Diet for obesity**

##### **For CHO**

- Those who are obese ought to consume low-GI foods.
- **Low-glycemic foods included fruits, vegetables, and carbohydrates.**
- Eat more GI items, such as milk, dal, fish, meat, oil, and leafy green vegetables.
- Eat no grains, processed carbs, flowers, or sweets.
- Consider consuming high-fiber meals such as complex carbohydrates, brown rice, whole grain bread, fruits, and potatoes.

##### **For Protein**

- Steer clear of cheese, hot dogs, tinned sausages, organ meat, marbled and fatty beef, full-fat milk, yogurt, and cheese.
- Select low-fat dairy items such as skim or low-fat milk, ) **low-fat yogurt, egg whites, fish, white meat, soybeans, and (for adults only) soymilk** instead.

##### **For Fat**

- Good fats, as opposed to harmful fats, should be ingested. You must eat

margarine, soybean oil, sunflower oil, and olive oil.

- Avoid consuming mayonnaise, butter, and ghee.

**Others-**

should eat and drink foods and drinks high in calcium, iron, and zinc.

## **CHAPTER 6**

### **6. Perspective of mine about the diet chart:**

It is clear that portion sizes and calorie counts vary across meals. Easing dietary constraints and personal preferences into the meal plan could help avoid the monotony of eating the same things over and over again. Daily meals that are repeated could cause one to lose interest in food. Incorporating **range of colors, textures, and tastes** : a into the diet can make eating more pleasurable and fulfilling.

## CHAPTER 7

### 7. Conclusion

I now understand diabetes well, including how it affects people's life, and how crucial eating patterns are to controlling the disease. My capacity to evaluate and examine people's eating patterns has given me the ability to identify recurrent trends and possible areas that need improvement. I now have a better understanding of the dietary recommendations made especially for diabetes, which helps me create customized meal plans for each client.

I've honed my counseling and communication abilities via encounters with nurses and patients, which makes it easier to offer assistance and precise nutritional suggestions. My understanding of the various social and cultural factors affecting patients' eating habits has grown, highlighting the significance of providing tailored advice. I've learned how to collect and analyze eating habits data so that I can make wise decisions.

Throughout the course of my internship, meaningful knowledge acquisition has transpired. Engaging with patients and healthcare professionals has significantly enhanced my communication proficiency. Witnessing the diverse spectrum of ailments in patients has further honed my skills and provided invaluable experiential learning. I have now gained a nuanced understanding of dietary preferences among individuals with diabetes.

I extend my sincere gratitude to Nawal Sarwar, my supervisor, for orchestrating this internship. In summation, this internship has not only fortified my skills but also equipped me for future endeavors in the field.

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## Diabetes Complications Nutritional Management at BIRDEM General Hospital

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