A survey on "Knowledge, attitude and lifestyle of Nonalcoholic Steatohepatitis (NASH) patients in Chattogram Division"

A dissertation submitted to Daffodil International University's Department of Pharmacy, Faculty of Allied Health and Sciences, Ashulia. This report was submitted in partial fulfilment of the requirements for the Master of Pharmacy degree.

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APPROVAL

This report, survey on **"Knowledge, attitude and lifestyle of Nonalcoholic Steatohepatitis (NASH) patients in Chattogram Division"** submitted to the Department of Pharmacy, Faculty of Allied Health Sciences, Daffodil International University, has been approved in terms of both layout and content and recognized as meeting the criteria for the Masters of Pharmacy degree in part.

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Declaration

I, Muhammad Farhad Hoshen, thus declare that I completed this project partially toward, the qualifications required by Daffodil International University for the Bachelor of Pharmacy degree workings below the supervision of Mr. Md Mizanur Rahman, Assistant Professor, and Department of Pharmacy. The results of this investigation were never submitted to a single other university or organization for a degree.

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Muhammad Farhad Hoshen

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Dedication

TO MY PARENTS & SUPERVISOR

Abstract

The main causes of nonalcoholic steatohepatitis are known to be excessive food consumption and inactivity (NASH). Currently, the only available treatment for NASH disease is lifestyle modification. It's unclear how best to encourage behavior change in this group of people. This study aimed to characterise the relationship between patient disease knowledge, attitudes, and behaviours as well as evaluate the impact of an educational intervention. There were 171 NASH patient interviews conducted in total, where male patients were 93 and female patients was 78. Though most patients knew that the main therapy was weight loss through diet and exercise, ambiguity surrounding the diagnosis and etiology of their liver disease was a major theme. Male NASH patients' dietary habits were considerably different from those of normal male subjects, including the length of dinnertime, the quantity of rice consumed, and the frequency of consuming meat, fries, Chinese noodles, sweets, and instant food on a weekly basis. There were distinctions in the amount of rice that women ate at suppertime, how often they ate out, and how much they enjoyed sweets. Compared to female patients, male individuals with NASH exercised far less. The lifestyle preferences of NAFL and NASH were remarkably similar. There were no discernible lifestyle differences between NASH individuals who were obese and those who were not. The survey's most surprising conclusion was that men's lifestyles played a significant influence in the emergence of NASH.

Keywords: NASH, Lifestyle, Exercise

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Chapter #1

INTRODUCTION

1. INTRODUCTION

Along with its increasing incidence, the range of non-alcoholic fatty liver disorders (NAFLD) is linked to a significant socioeconomic burden, which presents a significant public health concern. NAFLD, the most prevalent liver disease worldwide, is a condition that arises from hepatic steatosis. NAFLD can be diagnosed by ruling out other potential causes of hepatic fat buildup, such as excessive alcohol consumption, as well as other potential liver disease aetiologies, such as chronic viral hepatitis. Obesity, type II diabetes, dyslipidemia, and metabolic syndrome are just a few of the metabolic conditions that are associated with NAFLD. Although it is highly prevalent worldwide, different genetic sequences, shifting patterns of sedentary lifestyles, and poor diet might alter the burden of NAFLD in different geographic areas. NAFLD affects around 45 million (33.86%) persons in Bangladesh. It is known that the hepatic unfavorable impact of metabolic syndrome is NASH, the inflammatory form of NAFLD. [1]

NASH is characterized by modifications to the hepatic histological structure, which encompass different degrees of fibrosis, damage, and steatosis. Hepatocellular carcinoma, NASH cirrhosis, and end-stage liver disease can all develop from NASH, and the only cure for the condition is still liver transplantation. To quantify disease burden, only the morbidity and death related to the illness are taken into account, which paints an incomplete picture. There has been few research done on the financial effects of this illness globally, particularly in Asian nations. According to a recent study on the economic load, the yearly cost of all events and common instances of NAFLD in the United States was estimated to be $103 billion. [2] This amount is equivalent to around €35 billion in Germany, France, Italy, and the United Kingdom. In Japan, the expense of NAFLD cirrhosis sickness was also investigated. Bangladesh has a prevalence of NAFLD that is higher than in neighboring countries, affecting about one-third of the population and increasing their risk of liver-related morbidity and mortality. It has been discovered that certain groups have a higher chance of developing NAFLD than others, including early to midlife adults, diabetics, overweight and obese people, rural women, and married people. From the perspective of Bangladesh, it is sought after that relevant data regarding the economic impact of NAFLD have not yet been found. Estimating the financial burden of NAFLD on the afflicted population is essential, as the disease is prevalent and may even be on the rise in this nation. The study's objective was to estimate the medical expenses of NAFLD patients in Bangladesh. This kind of analysis could help address the significant public health challenge posed by the asymptomatic condition's increasing prevalence. [3]

1.1. Stages of NAFLD:

NAFLD describes a variety of disorders brought on by an excess of fat that is retained in the liver in those who consume little to no alcohol. There should be little to no fat in healthy liver cells. It is deemed excessive when there is over 5% of fat kept in liver cells, which can lead to a fatty liver. [2]

There are four stages of NAFLD-

i. Steatosis
ii. NASH
iii. Fibrosis
iv. Cirrhosis

1.1.1. The initial stage is steatosis:

This happens when the fat cells in the liver begin to accumulate, even though there isn't any inflammation or scarring yet. Because there are frequently no symptoms in this early stage, a lot of people's are not aware that they have a fatty liver. More people's fatty livers do not worsen, and the extra fat in their liver cells can be decreased with a nutritious diet and frequent exercise. NASH is estimated to occur in 20% of individuals with simple fatty liver.

1.1.2. The second stage isNASH:

This phase happens when inflammation coexists with the fat accumulation in liver cells. It is estimated that up to 5% of the UK population, or one in every twenty, may be affected by this stage. When the liver is mending damaged tissue, inflammation results. Increased tissue damage may eventually make it difficult for the liver to heal the damaged tissue quickly enough, leaving the inflammatory tissue as a scar. Fibrosis is the term for the onset of scar tissue.

1.1.3. The third stage is fibrosis:

This happens when the liver and the blood vessels that surround it have persistent scar tissue. At this point, the liver can still function fairly well, and treating or eliminating the inflammatory process may stop the damage from getting worse or even reverse some of it. However, the liver's ability to function is jeopardised if scar tissue gradually replaces a large portion of healthy liver tissue. Cirrhosis may develop as a result of this.

1.1.4. **The fourth stage is cirrhosis:**

At this point, the liver malfunctions and symptoms like skin and eye whites yellowing and a dull ache in the lower right side of the ribs begin to show. Although it is challenging to remove the scar tissue associated with liver cirrhosis, removing the underlying cause of the damage to the liver can stop the disease's progression.

1.2. What is NASH?

NASH is the most severe form of NAFLD, in which the liver accumulates redundant adipose deposits. The digestive system includes the liver. This organ aids in the digestion of food, energy storage, sludge waste removal, and poison removal. A healthy liver has some fat in it, but if liver has more than five percent fat, you may have NAFLD. This fat is referred to as NASH when inflammation is present. Despite the fact that NAFLD can be mild and asymptomatic, if it worsens and becomes NASH, individuals may experience liver damage that is comparable to that brought on by alcohol abuse even if they haven't been drinking. Although mild liver damage can be repaired by the body, if the damage is severe or persistent, the liver tissue will eventually be replaced by scar tissue (a process called fibrosis). Liver cirrhosis could result from this. With cirrhosis, the liver suffers irreversible damage that renders it incapable of performing its function properly. Specific new procedures and medications in NASH could be a new lifeline for those suffering from this severe liver disease. [2]

NASH is an insulin-resistant liver disease. This is frequently type 2 diabetes's initial clinical symptom. Among NASH patients, the incidence of diabetes ranges from 21% to 75%. This stands in contrast to another Indian report. Diabetes in India has determined that obesity and hyperlipidemia are uncommon manifestations of NASH. Insulin normally encourages the synthesis of glycogen. encourages synthesis while blocking the oxidation of mitochondrial fatty acids and gluconeogenesis. Insulin resistance is linked to reduced carbohydrate oxidation and increased lipid oxidation, which causes oxidative stress and hepatocyte fat accumulation. While patients with steatohepatitis frequently have a slowly progressive course or do not have fibrosis or cirrhosis, the clinical course of liver disease is most likely to develop serious complications. In contrast, the majority of patients with simple steatosis have a slowly progressive clinical course. [1]

1.3. Is NASH more serious than NAFLD?

A chronic liver disease called NAFLD is brought on by an excess of fat in the liver. It is closely associated with conditions like type 2 diabetes, heart and circulatory disease, and being overweight. A more serious form of NAFLD is also known as NASH. Liver failure or cancer may result in a small percentage of individuals. Eating a well-balanced diet, exercising, and, if necessary, losing weight are the main treatments for NAFLD. According to research, these can lessen liver fat and occasionally even cure NAFLD. [2] Liver problems such as liver cancer and cirrhosis can occur in people with NASH. A liver transplant may be required if cirrhosis results in liver failure. Individuals with NASH are more likely to pass away from liver-related illnesses. [3]

1.4. What is the prevalence of NASH?

NAFLD, the most common chronic liver disease, affects approximately 25% of adult patients. The majority of NAFLD patients have a fatty, inflamed liver. But 20% of NAFLD patients experience NASH, a potentially fatal liver inflammation. Over 115 million adults worldwide are thought to be affected by NASH. [4]

In the general people, NASH prevalence was reported to be between 22% and 37% (US: 22%-32%; Europe: 29-37%; Asia: 29.7%). Within the NASH population, reports of biopsy-confirmed NASH ranged from 16% to 70% (US: 42-68%; Europe: 16-45%; Asia: 70%). [5]

1.5. Etiology of NASH

NAFLD and NASH have been linked to specific conditions. NAFLD is strongly correlated with obesity. The metabolic syndrome, which includes dyslipidemia, hypertension, obesity, type 2 diabetes mellitus, and hyperinsulinemia, is closely linked to NAFLD. A greater proportion of cirrhosis and fatty liver disease are present in approximately 75% of patients with insulin resistance and type 2 diabetes mellitus. [6] Weber-Christian disease, Wilson disease, lipodystrophies, polycystic ovary disease, and mitochondrial disorders are additional metabolic and genetic disorders linked to non-alcoholic fatty liver disease (NAFLD). NAFLD is linked to nutritional overload states like complete parenteral nutrition and malnutrition (like in Kwashiorkor and celiac disease). [7]

Despite having greater rates of obesity and diabetes than Hispanic Americans, people of African American descent have lower rates of non-alcoholic fatty liver disease (NAFLD). This can be explained by their genetic variety. [8] Adiponutrin, also known as patatin-like phospholipase domain-containing protein 3 (PNPLA3), is a protein that mediates the breakdown of fat and, depending on its expression,

can raise hepatic fat levels. Because Hispanic Americans have been found to have higher levels of this protein, polymorphisms in the gene coding for this protein have been linked to the ethnic variation of NAFLD. [9]

1.6. Epidemiology of NASH

In the industrialized world, non-alcoholic fatty liver disease (NAFL/NASH) is the most frequent cause of abnormal liver enzyme levels. In the United States, the prevalence of NAFLD and NASH in adults is between 30% and 40% and 3% and 12%, respectively, and has been rising in tandem with the rising rates of the predisposing conditions. The prevalence varies by ethnic group as well; Hispanics have the highest prevalence, followed more closely by Caucasians than by African-Americans. It can appear at any age, and as people age, so does its frequency. [10]

1.7. Pathophysiology of NASH

NAFLD is a hepatic condition characterized by dysfunctional adipose tissue due to an excess of energy. Steatosis, a condition with over 5% liver fat, is a factor in both cases. The liver eliminates fat through exporting it as VLDLs or beta-oxidizing FFA, primarily in mitochondria, peroxisomes, and cytochrome P-450. [11]

Adipose tissue releases free fatty acids (FFAs) through hormones like adrenocorticotropic hormone, glucagon, and adrenaline, which are inhibited by insulin. Insulin can prevent improper postprandial lipolysis. Excessive calorie intake and parenteral nutrition can lead to hepatic lipotoxicity, resulting in toxic fat accumulation in the liver. Inadequate MUFA synthesis or malfunction in VLDL secretion can cause toxic fat accumulation. [12]

Liver triglyceride accumulation, often referred to as hepatic steatosis, may be the body's defense mechanism against excess energy in the liver. Toxic fat accumulation in hepatocytes is caused by free fatty acid nontriglyceride metabolites, which may include diacylglycerol, free cholesterol, ceramides, saturated fatty acids, and lysophosphatidylcholine. The two-hit hypothesis' linearity is challenged, as isolated steatosis may indicate hepatotoxic stress, and NASH may develop when the body's defenses against hepatocyte stress fail. [13]

Mitochondrial dysfunction leads to oxidative phosphorylation impeded, causing ATP production and ATP production. This results in reactive oxygen species (ROS), damage to the endoplasmic reticulum,

and lipid peroxidation. This damage damages DNA, proteins, and membranes, triggers apoptosis and necrosis, and releases inflammatory cytokines. Hepatic lipotoxicity causes oxidative stress, endoplasmic reticulum stress, dysfunctional adipose tissue, ineffective autophagy, and gut flora dysbiosis. [14]

1.8. History & Physical conditions

The majority of NAFLD and NASH patients have no symptoms, and the illnesses are typically discovered by chance during routine blood work. On the other hand, some NASH patients may exhibit pain or discomfort in the right upper quadrant, possibly as a result of hepatomegaly-induced liver capsular stretching. A non-specific physical examination can reveal hepatomegaly related to steatosis, insulin-resistant acanthosis nigricans (higher pigmentation around the neck and joints), and stigmata associated with liver cirrhosis, such as splenomegaly, ascites, palmar erythema, and spider telangiectasias. [15]

1.9. Causes of NASH:

NASH is a severe, ever-expanding type of fatty liver disease unrelated to alcohol use. It has been linked to hepatic inflammation and buildup of fat. Fibrosis, or the scarring of liver tissue, can result from this inflammation. This scarring may get worse with time. If the damage worsens, cirrhosis may result. This raises the possibility of liver failure because scar tissue replaces healthy tissue. It's unclear exactly what causes non-alcohol-related fatty liver disease. Up to 80% of persons with obesity have non-alcohol-related fatty liver disease, which is another risk factor for obesity that can be brought on by certain dietary and lifestyle choices. [16]

1.10. Diagnosis of NASH

Fatty liver disease is frequently found during a routine blood test or screening for another medical condition because most people with NASH do not exhibit symptoms and screening for it is not advised at this time. For instance, elevated liver enzyme levels may be seen in blood work, or an abdominal ultrasound may indicate an enlarged liver. Doctor will assess for fatty liver disease using a range of techniques. To diagnosed NAFLD which includes NAFL and NASH, doctors use a some information and some tests. [12] [2]

1.10.1. Medical history

Within the medical history, the physician will ask-

- ✓ Being obese or overweight
- ✓ Diabetes
- ✓ abnormally cholesterol level or triglyceride levels in blood
- ✓ What medications you take to find out if any of them could be the cause of your fatty liver.
- ✓ Asking about alcohol consumption can help determine whether the fat in liver is an indication of AFLD or NAFLD. Since medical testing cannot determine whether alcohol consumption is the cause of liver fat, it is important that you tell doctor the truth.
- ✓ The type of food you eat, how active you are, and other aspects of your lifestyle can all affect your chance of developing NAFLD.
- ✓ If have a medical history of other conditions that raise risk of developing NAFLD

1.10.2. Physical exam

Doctor will look for signs of NAFL or NASH, such as

- Check body for any indications of NAFLD or NASH
- Measure your height and weight to determine body BMI. BMI calculates the appropriate weight for your height. To find out which category your BMI falls into, look at the chart below. The majority of experts state that obesity, or a BMI of more than 30, is unhealthy.

Your BMI might not be an accurate indicator of your level of body fat if you are muscular or less muscular than average. Your waist-to-hip ratio and waist circumference may also be taken into account by your healthcare provider.

1.10.3. Blood tests

Medical evaluation will include the following blood tests.

- ✓ Liver function tests (LFTs) are blood tests used to identify, assess, and track liver damage.

Liver cells contain enzymes that aid liver function. Enzymes leak into blood when damaged, allowing liver enzyme testing to measure levels, typically focusing on AST and ALT.

Liver may have more of these enzymes than usual if inflammation has caused damage to it. Nevertheless, neither the amount of potential fibrosis nor the likelihood of future liver damage is indicated by ALT and AST levels. Additionally, these liver enzymes may be normal in certain NAFLD patients.

- ✓ Fibrosis assessment tests: degree of liver fibrosis or scarring is estimated by the results of these blood tests.
- ✓ Lipid Profile: Triglycerides and cholesterol are two blood fats that are measured by this test.

1.10.4. Imaging test

Doctor might recommend tests that entail taking images, or pictures, of your liver in order to help with the diagnosis of liver disease. A variety of tools can be used to produce different kinds of images, such as:

- ✓ Ultrasound: which creates an image of your organs' structure by reflecting safe, painless sound waves off of them using a device called a transducer.
- ✓ Computed tomography (CT) scan: this produces images of your liver by combining computer technology and x-rays.
- ✓ Magnetic resonance imaging (MRI): which uses radio waves and magnets to create detailed images of soft tissues and organs instead of x-rays..

Dctor cannot diagnose NASH or simple fatty liver using these tests because they are unable to detect fibrosis or inflammation. On the other hand, fibrosis can also be determined by other imaging tests that gauge your liver's stiffness. The presence of scarring is reflected in the stiffness of the liver; the more scarring, the stiffer the liver. Your doctor can diagnose and treat liver fibrosis based on the results of the tests listed below.

- ✓ Ransient elastography: This test uses a specialised ultrasound machine to measure liver stiffness. Similar to a standard ultrasound, this examination is non-invasive and painless.
- ✓ Magnetic resonance elastography (MRE): This is a more recent noninvasive test that shows gradients of stiffness throughout the liver through a visual map created by combining features of MRI and ultrasound imaging. In patients who are extremely obese, MRE has been demonstrated to be a more accurate indicator of liver stiffness.

1.10.5. Liver Biopsy

The only test that can definitively diagnose NASH and demonstrate the full extent of the illness is a liver biopsy. Compared to elastography, liver biopsy can detect fibrosis at an earlier stage. Doctors do not, however, advise liver biopsy for every patient with suspected NAFLD. If your other tests indicate advanced liver disease or cirrhosis, or if you are more likely to have NASH with advanced fibrosis, your doctor might suggest a liver biopsy. For the purpose of ruling out other liver diseases, doctors may occasionally advise a liver biopsy.

NASH is suspected if your medical evaluation reveals no other possible causes of liver disease (e.g., medication side effects, viral hepatitis, excessive alcohol consumption), and imaging studies of your liver reveal liver stiffness and fat. If your physician believes additional testing is necessary to confirm the diagnosis of NASH, a liver biopsy may be recommended.

A biopsy involves your doctor taking a tiny sample of liver tissue for analysis in a lab by inserting a needle between your ribs into your liver. When tissue is examined under a microscope and fat, inflammation, and damage to the liver cells are observed, NASH is diagnosed. A diagnosis of simple fatty liver, or NAFLD, is made if the tissue exhibits fat without inflammation or damage.

1.11. NASH and Genetics

Genetics seem to contribute to NAFLD and NASH. Certain variations in the PNPLA3 gene are among the gene changes that have been found through research to potentially be involved. This gene provides instructions to cells on how to make the protein called adiponutrin, which is present in fat and liver cells. Researchers think that a specific mutation in the PNPLA3 gene may lead to increased fat synthesis and decreased hepatic fat breakdown, potentially accelerating the onset of nonalcoholic steatohepatitis (NASH). [13]

Through genome-wide association studies, genetic modifiers of disease severity and progression have been identified. Among them is the Patatin-like phosholipase domain-containing 3 (PNPLA3) gene variant I148M, which is independent of insulin resistance and serum lipid concentration and a key factor in determining inter-individual and ethnicity-related variations in hepatic fat content. The I148M polymorphism is also a potent modifier of NASH and progressive hepatic injury, according to association studies. [17] Additionally, a few sizable multicenter case-control studies have confirmed that hepatocellular fat accumulation and insulin resistance are important operational mechanisms closely linked to the progression of liver damage and have shown a role for genetic variants implicated

in oxidative stress, fibrogenesis, and insulin signalling in the progression of NAFLD towards fibrosing NASH. Investigating the molecular mechanisms underlying these correlations between gene variants and the development of liver disease is now crucial, as is assessing how they affect the efficacy of currently available treatments. The most effective verified susceptibility modifiers for steatosis and progressive hepatic injury are polymorphisms in PNPLA3. Nonetheless, a number of additional genetic variations have been found to be risk factors for progressive NASH and to contribute to steatosis and/or steatohepatitis. [15]

1.12. NASH in Children

In the United States, NAFLD is the most frequent cause of chronic liver disease in children. NAFLD in children increases in tandem with the prevalence of childhood obesity. Roughly 6 million children in America between the ages of 2 and 19 are thought to have NAFLD, a condition that can progress to NASH. Asian-American and Hispanic children, as well as older children, are more likely to have NAFLD. Children with NAFLD have a higher chance of developing NASH or related complications as adults compared to those with adult-onset NAFLD.

Children with particular health issues, such as overweight and illnesses associated with obesity such as type 2 diabetes/pre-diabetes, elevated blood pressure, and elevated cholesterol levels, are just as likely as adults to develop NAFLD and NASH. Experts are baffled as to why some children with NAFLD have simple fatty liver and others have NASH. According to research, children with type 2 diabetes and NAFLD are more likely to have NASH. Specific genes may also increase a child's risk of developing NASH. [14]

1.13. Prevent NASH

Eat a healthy diet, exercise frequently, watch your portion sizes, and maintain a healthy weight to prevent NASH. Unlike genetics, age, and race, which are inherent risk factors for NASH, some of these can be lessened by leading a healthy lifestyle and eating a balanced diet that can support liver protection. [5] Among them are-

- Maintain a healthy weight: This could lessen or even stop the effects of NAFLD. Losing weight can lead to a return to simple fatty liver, but gaining weight can ignite NASH again.
- Consume fat in moderation: People can avoid obesity and protect their livers and hearts by consuming fewer fats and smaller portions. Eating unsaturated fats such as omega-3 fatty acids

instead of less advantageous fats can improve health and help control weight. These fats are particularly abundant in fruit, nuts, and seafood. In NASH patients, this diet may also reduce the risk of heart disease.

- Eat more low-glycemic index foods: Less blood glucose is affected by fruits, vegetables, and whole grains than by high-glycemic foods like potatoes, white rice, and white bread.
- Avoid fructose: Fructose is a simple sugar that raises blood glucose levels quickly and is present in juice, drinks and many foods. The risk of developing NASH is increased by diets high in fructose.
- Minimise alcohol intake: For those with NASH already, heavy drinking can exacerbate liver damage already present.
- Exercise: Make the most of daily activities. If haven't been exercising consistently, get the go-ahead from medical team beforehand.

1.14. How Fast Does NASH Progress?

Fibrosis, or the formation of scar tissue from inflamed liver tissue, is the first step in the NASH progression to cirrhosis and can impair liver function. More than one-third of NASH patients go on to develop cirrhosis, which raises the risk of liver cancer. Most patients with NAFLD have it for years before they experience cirrhosis or other NASH complications. [16]

1.15. NASH Complications

NASH raises the possibility of liver cancer and cirrhosis-related liver failure, which may necessitate a liver transplant. For someone with advanced liver disease (cirrhosis), the average life expectancy is nine to twelve years. Nonetheless, NASH significantly lowers adult life expectancy and raises the risk of cardiovascular disease. Might require a liver transplant if cirrhosis results in liver failure. Patients with NASH are more inclined to perish from diseases relating to the liver. [8]

1.16. NASH Treatment

Over the next ten years, NAFLD is projected to rise to the top of the global chronic liver disease cause list. Despite the fact that many medications have been tested in clinical trials, the majority of them have

produced conflicting findings and adverse effects that are poorly tolerated. The Food and Drug Administration has not approved any medication for the treatment of biopsy-proven non-alcoholic steatohepatitis (NASH). Numerous studies have used vitamin E and pioglitazone to treat NASH patients who have had biopsy-proven nondiabetic conditions. Despite some observed reduction in inflammation, these medications did not improve the fibrosis aspect of NASH.

While NAFLD, which includes NASH, currently has no approved treatments, researchers are investigating a number of alternative therapies. Because some herbal remedies can cause or worsen liver damage, the National Institutes of Health recommends that people with fatty livers consult a doctor before starting any dietary supplements or alternative treatments. [9]

Losing weight, which can sometimes be accomplished by following a nutritious diet and getting regular exercise, may be beneficial for those who are overweight. It is possible to reduce fat deposits in the liver by at least 3% to 5% of total weight loss, and to reduce scar tissue and inflammation in the liver by reducing weight by 7% to 10%. [3]

To find the perfect medication for treating NASH, numerous trials have been conducted. The FDA has not yet approved any drugs for the treatment of simple steatosis or NASH, despite several advancements in our understanding of the pathophysiology underlying this prevalent disease. The FDA recently accepted a new medication application for Obeticholic acid (OCA), a farnesoid X receptor (FXR) agonist that has been demonstrated to improve fibrosis in NASH patients but has not yet been approved. [11]

1.17. Global Impact of NASH

Globally, both in developing and developed nations, NASH is on the rise. By 2030, 48.26 million Chinese citizens are expected to have NASH. 1.8 million cases in Europe & Spain in 2016, and by 2030, that number is expected to increase by 49%. 3.33 million NASH cases were reported in Germany in 2016; by 2030, that number is expected to rise by 43%. In addition, experts predict that by 2030, there will be 27 million NASH cases in the US. [12]

An increase in NASH cases not only has a detrimental effect on lives, but it can also have a severe financial impact on governments, payers, patients, and their families. In the United States, the estimated yearly direct cost of treating non-alcoholic fatty liver disease (NAFLD) is $103 billion; in Germany, France, Italy, and the United Kingdom, it is roughly €35 billion. [7]

Chapter # 2

AIMS & OBJECTIVE OF THE STUDY

2.1 Overall Objectives

- ✓ Determine the knowledge, attitude, awareness and lifestyle of NASH patients in Chattogram division.

2.2 Specific Objectives

- ✓ To gain a better understanding of risk factors for nonalcoholic steatohepatitis (NASH)
- ✓ To determine the common cause and treatment option of NASH.
- ✓ To assess the knowledge on causes of NASH.
- ✓ To assess the knowledge on prevention of NASH.
- ✓ To increase awareness of the society about NASH.

Chapter # 3

METHODS & MATERIALS

3.1Methods:

The methods employed about NASH affected people in the Chattogram division at some of the selected public and private hospitals.

3.1.1 Study Design:

Cross-Sectional study

3.1.2 Study period:

Three months (August 2023 -October 2023)

3.2Study process:

For this survey, I adhere to the following standards.:-

3.2.1 Populations*:*

Hospital patients (Chattogram division, Bangladesh) randomly collected information on NASH affected people for this survey. Information on 171 patients was gathered from the Medicine & Haematology department between August 2023 and October 2023, at roughly three-month intervals. Each patient's unique information, personal information, disease type, kind of medication prescribed, and lifestyle, is gathered with the assistance of medical professionals. Additionally, all data was kept private and used for research.

3.2.2 Selection of the area:

Due to short period of time and time Chattogram division was selected as the study region.

3.2.3 Term of survey:

The survey ran for three months, starting in August 2023 and ending in October 2023. Based on the many goals of the study, a work schedule was developed to finish the survey on time. We spent a full month working on the discrimination protocol uplift topic. The official consistency, data recruitment, data exploration, and report writing took up the remaining months.

3.2.4 Inclusion Criteria:

Adult, young, and geriatric hematology department patients are included in my study.

Patients age: 14 years to above.

Sex of Patients: Both

Physicians: On Hematologist

Area: Chattogram division

3.2.5 Exclusion Criteria:

- New born baby, neonates were not included.
- Unwilling to participate were excluded from this survey.

3.3 Statistical Analysis:

All NASH-affected people's data is first entered into Microsoft Excel, where it is stored systematically. The statistical analysis was then carried out using the programmes included in the SPSS statistics package.

Chapter# 4

RESULT & DISCUSSION

3. RESULTS

The primary goal of this survey was to observe NASH patients from various hospitals in the Chattogram division. Over the course of three months, a total of 171 medical case records were gathered, examined, and analyzed. Table 1 displays that of the 171 patients, 93 (54.39%) were male and 78 (45.61%) were female.

Section A: Socio-demographic characteristics

Table 1: A tabular representation of patient demographic data.

Gender	No. of patients	(%)
Male	93	54.39
Female	78	45.61

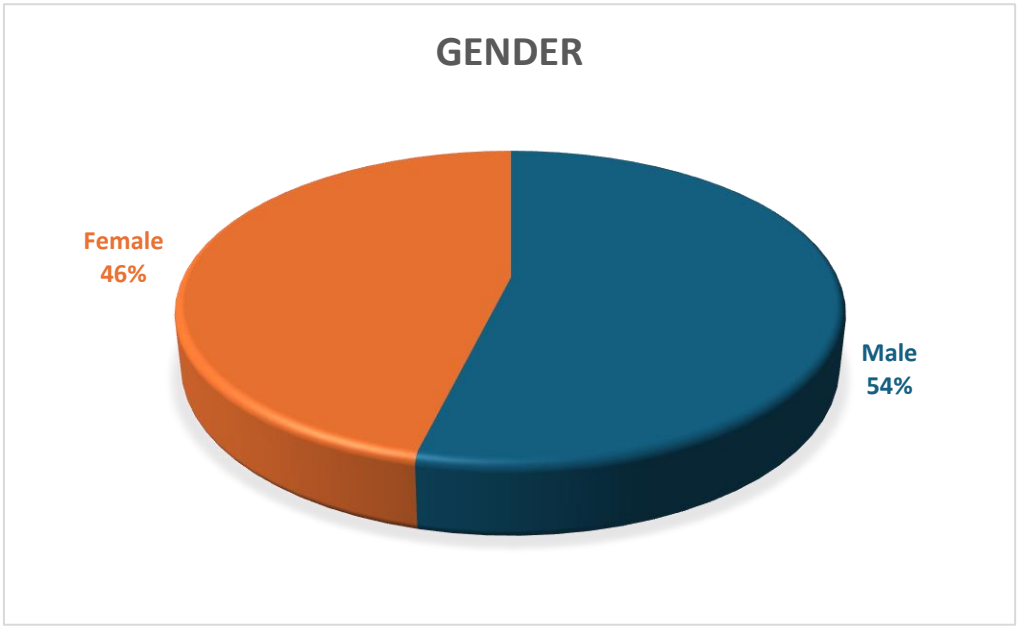
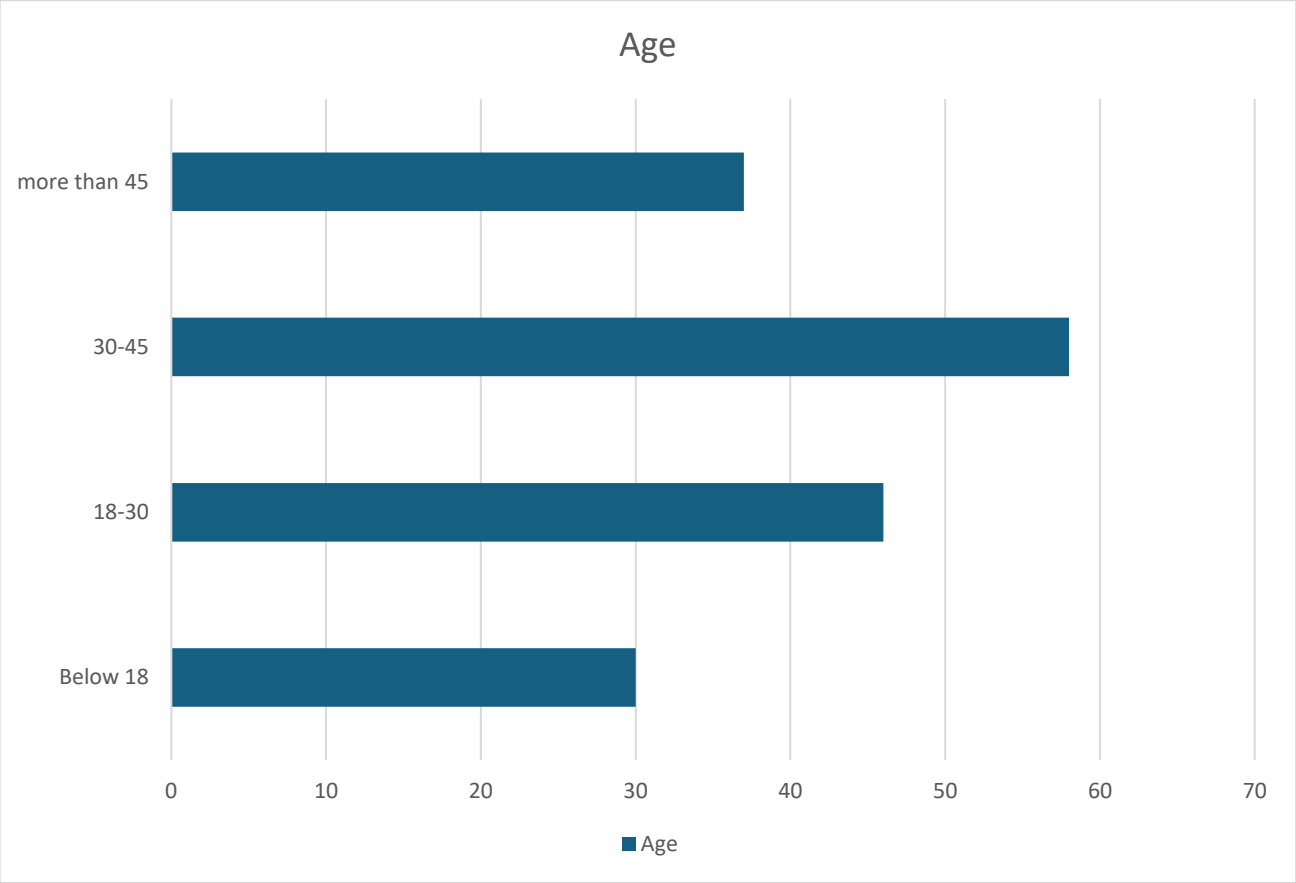


Figure: Percentages male-female data of total prescription

The above table shows that the majority of the respondent were male 54% and 46% were female.

Table 2: A tabular representation of patient's age:

SL NO	Age	No of Patients	%
1	Below 18	30	17.54
2	18-30	46	26.91
3	30-45	58	33.91
4	More than 45	37	21.64



According to the above table, 30-45 years 33.91%, below 18 years were 17.54, 18-30 years were 26.91% and more than 45 years were 21.64%.

Table 3: A tabular representation of patient's marital status:

Marital status	No. of patients	%
Married	98	57
Unmarried	73	43

The above table shows that majority of the respondents were married 57% and 43% were unmarried.

Table 4: A tabular representation of patient's religion:

Patient	No. of patients	%
Muslim	125	73
Hindu	40	23
Christian	06	04

The above table shows that majority of the respondents were Muslim 73%, 23% were Hindu and 04% were Christian.

Table 5: A tabular representation of patient's living status:

Living status	No. of patients	%
Village	62	36
City	109	64

According to the above table, 64% of respondents lived in cities and 36% in villages.

Section B: Medical Information

Table 6: A tabular representation of patient's body mass index:

BMI	No. of patients	%
<23kg/m^2	04	02
23-24.9kg/m^2	34	20
25-26.9kg/m^2	75	44
≥27 kg/m^2	58	34

The above table shows that majority of the respondents were Obesity patients.

Table 7: A tabular representation of patient's medical information:

Medical information	Yes	No
1. Has NASH been diagnosed by a physician?	171	00
2. The diagnosed confirmed with biopsy?	22	151
3. Do you have diabetes?	79	92
4. Your cholesterol level is normal?	44	127
5. Are you physically active?	78	91

Section C: Knowledge about NASH

Table 8: Data of patient's knowledge about NASH:

Knowledge about NASH	Strongly agree	Agree	Disagreed	Strongly disagree
1. Obesity is set to become the leading cause of NASH?	96	71	04	00
2. You can avoid the progression of NASH through diet and exercise?	103	63	05	00
3. Weight loss is the most important way to prevent NASH?	87	56	28	00

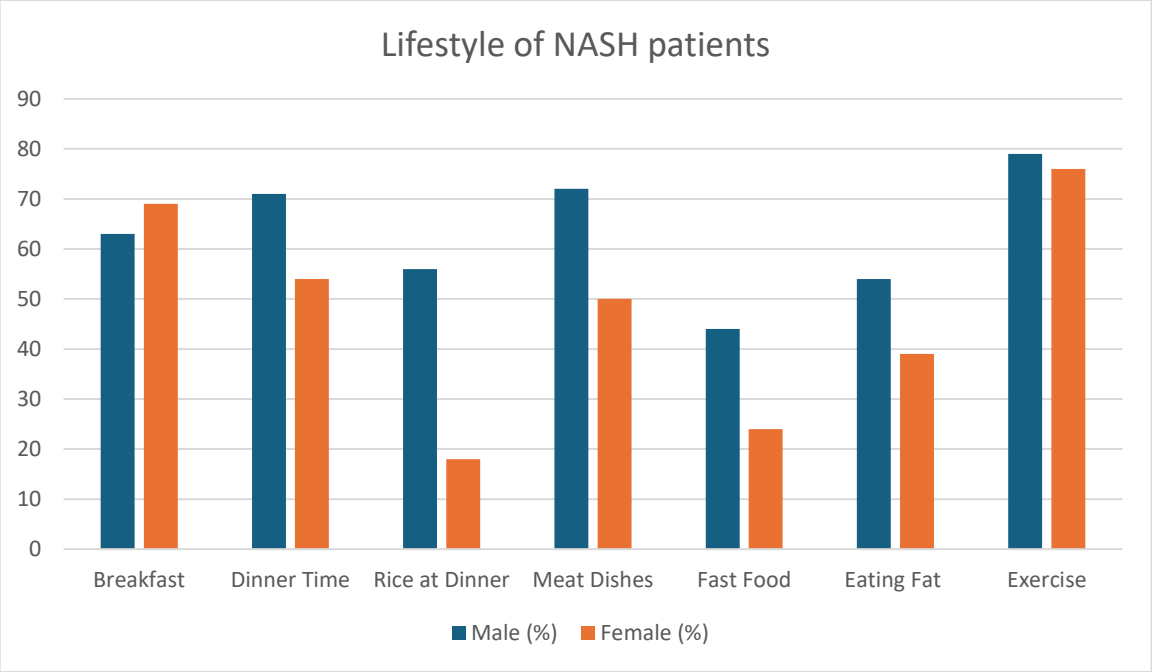
Table 9: Most prescribed drugs for NASH:

Medical information	Number of patients N = 171	(%)
1. Vitamin E	125	73
2. Obeticholic acid	166	97
3. Ursodeoxycholic acid	26	15

Section D: Lifestyle

Table 10: A tabular representation of patient's lifestyle:

Lifestyle of NASH patient's	Male (%)	Female (%)
1. Having breakfast?	63	69
2. Time required for dinner (< 30 min)	71	54
3. Rice at dinner (> 1 bowl of rice)	56	18
4. Meat dishes (≥ 3 times per week)	72	50
5. Fast food (≥ Once per week)	44	24
6. Eating out (≥ 3 times per week)	54	39
7. No regular exercise	79	76



Section E: Effects of NASH

Table 11: Tabular representation of demographic data of effect of NASH

Effect of NASH	Yes	No
1. Do you think NASH can cause fibrosis?	71	29
2. Do you think NASH can cause liver damage?	80	20
3. Do you think NASH can affect the heart?	60	40
4. Do you think NASH can affect the brain?	45	55
5. Can you live a normal life with NASH?	65	35

3.1 DISCUSSION

According to our findings, dietary and exercise practices may have played a role in the development of male NASH. In some NASH patients—possibly as much as one-third—persistent liver damage results in progressive fibrosis and cirrhosis, and NASH may contribute to cryptogenic cirrhosis. These days, NASH poses a serious health risk to obese kids as well, with some developing cirrhosis as a result. The evolving diagnostic requirements for NASH are based on the histologic findings of fibrosis, ballooning, and hepatocellular injury (Mallory bodies). While there are no strict guidelines, generally speaking, establishing the diagnosis and staging of the injury are recognized indications for biopsy. Due to their insensitivity, liver enzymes cannot be accurately used to stage the degree of fibrosis or confirm the diagnosis. Fibrosis is predicted by advanced age, obesity, and diabetes. Multifactorial pathophysiology underlies NASH.

In both adults and children, NASH is a serious type of chronic liver disease. NASH can progress from a slow-moving liver disease to an advanced stage of the disease. The goal of current research is to identify the histologic and/or clinical progression markers. Cryptogenic cirrhosis may have NASH lesions as a contributing factor, and NASH lesions may reappear in liver transplant recipients. Although a growing number of pathogenetic mechanisms and clinical conditions have been discovered, many cases are still considered "idiopathic," meaning that all cases lack significant alcohol use. Since laboratory results and clinical evaluation cannot confirm the diagnosis or rule out NASH, liver biopsy interpretation is still considered the "gold standard" for diagnosis.

4.4 CONCLUSION:

This finding implies that the development of male NASH was influenced by dietary habits and exercise. Most patients with NASH have a stable, generally benign condition; however, 7%–16% of them have index biopsy specimens with cirrhosis, and end-stage liver disease and cirrhosis have been observed to progress. Only 10-15% patients routinely check and monitor by liver biopsy. As a treatment option more than 80% patients taken Obeticholic acid, that showed improved liver histology including fibrosis, ballooning, steatosis and inflammation. 70% were taken Vitamin E. Although there isn't a proven medical cure for NASH, therapy primarily focuses on moderate, long-term weight loss.

Chapter # 5

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