UNDERSTANDING THE PREVALENCE, AWARENESS, AND LIFESTYLE FACTORS ASSOCIATED WITH FATTY LIVER DISEASE IN COMBINED MILITARY HOSPITAL (CMH), DHAKA, BANGLADESH

A PROJECT REPORT
BY
SHARMIN SHILPY NOKSHI
ID: 191-34-181

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

Supervised by
Dr. Md. Bellal Hossain
Dean (In-Charge) & Professor
Department of Nutrition and Food Engineering
Faculty of Allied Health Science

FACULTY OF ALLIED HEALTH SCIENCES (FAHS
DAFFODIL INTERNATIONAL UNIVERSITY
DECEMBER 2023

APPROVAL

This Project titled "Understanding the Prevalence, Awareness, and Lifestyle Factors Associated with Fatty Liver Disease in Combined Military Hospital (CMH), Dhaka, Bangladesh", submitted by Sharmin Shilpy Nokshi 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.

EXAMINING COMMITTEE

Chairman of the Board

External Member

Internal Member - 1

Internal Member - 2

Dr. Nizam Uddin
Head
Nutrition and Food Engineering
Faculty of Allied Health Sciences
Daffodil International University

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DECLARATION

We hereby declare that this project has been done by us under the supervision of Dr. Md. Bellal Hossain, Dean (In-Charge) & Professor, Department of Nutrition and Food Engineering, 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.

Supervised by:

Dr. Md. Bellal Hossain
Dean (In-Charge) & Professor
Department of Nutrition and Food Engineering
Daffodil International University

Submitted by:

Sharmin Shilpy Nokshi
ID: 191-34-181
Department of Nutrition and Food Engineering
Daffodil International University

ACKNOWLEDGEMENT

First, I express my heartiest thanks and gratefulness to almighty for His divine blessing makes it possible to complete the final year project/internship successfully.

I am grateful and wish my profound indebtedness to Dr. Md. Bellal Hossain, Dean (In-Charge) & Professor, Department of Nutrition and Food Engineering, Daffodil International University. Deep Knowledge & keen interest of our supervisor in the field of Nutrition to carry out this project. His endless patience, scholarly guidance, continual encouragement, constant and energetic supervision, constructive criticism, valuable advice, reading many inferior drafts and correcting them at all stages have made it possible to complete this project.

I would like to express my heartiest gratitude to Dr. Nizam Uddin, Head of the Department of Nutrition and Food Engineering, for his kind help to finish our project and to other faculty members and the staff of the Department.

I would like to thank my entire course mate in Daffodil International University, who took part in this discussion while completing the course work.

Finally, I must acknowledge with due respect the constant support and patience of my parents.

ABSTRACT

The prevalence of fatty liver disease is rapidly increasing globally and presents a public health challenge. This study aimed to evaluate the prevalence, awareness, and lifestyle factors associated with fatty liver disease among 200 residents in Dhaka, Bangladesh. Participants were stratified by age and sex, with a majority above 50 years and 62.72% male. Medical history indicated that 68.31% had been previously diagnosed with fatty liver disease, but only 31.79% had received any specific treatment. Co-morbidities like diabetes and hypertension were prevalent in 45.08% and 51.66% of the respondents, respectively. Hospital admission data revealed that 59.64% were aware of their fatty liver disease condition prior to their current hospital stay, and 41.22% of this sought medical care influenced by this awareness. Lifestyle and dietary patterns varied, with only 28.37% following a balanced diet. A significant 53.73% had no dietary restrictions, while alcohol and tobacco usage stood at 12.78% and 31.10%, respectively. About 53.37% had received diet therapy, with 78.12% planning to continue it. Diagnostic assessments during the current hospital admission indicated that 81.29% were informed about the severity of their fatty liver condition, and 67.83% of these underwent further diagnostic testing. The study concludes that fatty liver disease is highly prevalent in Dhaka, with low levels of targeted treatment and lifestyle modification. Awareness partially drives healthcare-seeking behavior, and there is a dire need for effective lifestyle interventions. Future research should aim to develop tailored treatment and prevention programs to manage this emerging health crisis.

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CHAPTER 1

INTRODUCTION

1.1 Background

Fatty liver disease, a burgeoning health issue globally, has been largely overlooked in the context of Dhaka, Bangladesh. As urbanization and lifestyle shifts accelerate, it becomes imperative to understand the prevalence, awareness, and lifestyle factors contributing to this disease in this geographical locale. This paper aims to fill the existing knowledge gap by providing comprehensive insights into these critical aspects. Bangladesh's rapid economic development and urbanization have led to significant lifestyle changes that have consequent health implications. Diet patterns have shifted towards higher fat and sugar consumption, and sedentary occupations have become increasingly common. These changes have engendered a rise in chronic conditions, among which fatty liver disease is prominent. However, there is a dearth of empirical data to substantiate the prevalence rates and to understand the awareness level among the population in Dhaka. Fatty liver disease manifests in two forms: alcoholic fatty liver disease (AFLD) and non-alcoholic fatty liver disease (NAFLD). While AFLD results from excessive alcohol consumption, NAFLD is strongly correlated with obesity, type 2 diabetes, and high blood lipid levels. Despite its silent progression, untreated fatty liver disease can lead to dire complications, including liver cirrhosis and hepatocellular carcinoma. Understanding the prevalence is pivotal for healthcare planning, while assessing awareness is crucial for preventive interventions. Moreover, identifying lifestyle factors associated with fatty liver disease can help shape public health policies aimed at reducing its incidence. Given the absence of prior comprehensive studies in Dhaka, this research aims to serve as a seminal work that could inspire further investigation and policy formulation in this area. This paper employs a multi-method approach, incorporating both qualitative and quantitative research techniques to derive nuanced insights. By examining the prevalence, evaluating awareness, and scrutinizing the contributing lifestyle factors, I hope to provide an encompassing overview of fatty liver disease in Dhaka, Bangladesh.

Fatty liver disease, comprising alcoholic fatty liver disease (AFLD) and non-alcoholic fatty liver disease (NAFLD), is a burgeoning global health issue, yet little is known about its prevalence, awareness, and associated lifestyle factors in Dhaka, Bangladesh. The consequences of untreated fatty liver disease are severe, ranging from liver inflammation to advanced liver cirrhosis and cancer. While there are studies examining these aspects in Western contexts, a focused understanding in the Dhaka setting is conspicuously absent. The rapid socio-economic development and urbanization in Dhaka have catalyzed shifts in diet and lifestyle, such as increased consumption of fatty and sugary foods, and a move towards more sedentary occupations. These shifts are suspected to contribute to the rise in fatty liver disease and other metabolic disorders. However, there is a striking lack of empirical data to gauge the true prevalence of the condition or to assess public awareness about the disease and its risk factors. This absence of data

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hampers effective healthcare planning and preventive interventions. Furthermore, without a clear understanding of the contributing lifestyle factors, it becomes challenging to develop targeted public health policies to mitigate the impact of the disease. Thus, there is an urgent need for a comprehensive study to explore these critical dimensions, which this article aims to address.

1.2 Objective

a) To determine the prevalence of fatty liver disease among patients admitted to hospitals in Dhaka, Bangladesh.

b) To assess the level of awareness among patients about their fatty liver disease condition before and after hospital admission.

c) To explore the dietary patterns, alcohol and tobacco consumption, and use of dietary supplements that may be associated with fatty liver disease among patients.

d) To investigate whether patients have previously received any treatment or interventions specifically for fatty liver disease.

e) To find out if patients are made aware of the severity of their fatty liver disease condition during their hospital stay.

f) To determine the proportion of patients who undergo diagnostic tests such as liver ultrasound and blood tests for fatty liver disease during their hospital admission.

g) To evaluate the willingness of patients to continue any prescribed dietary changes or therapies post-discharge.

CHAPTER2

LITERATURE REVIEW

This study aims to fill critical gaps in knowledge concerning this increasingly common but often misunderstood condition. Understanding fatty liver disease's prevalence, mechanisms, awareness levels, and lifestyle factors is essential for healthcare policy, individual treatment, and public awareness campaigns. This literature review seeks to explore existing studies and data concerning the prevalence, awareness, and lifestyle factors associated with fatty liver disease globally and in Bangladesh.

Fatty liver disease, both alcoholic (AFLD) and non-alcoholic (NAFLD), is increasingly recognized as a major public health concern. A meta-analysis by **Younossi et al. (2018)** estimates that NAFLD affects approximately 25% of the global population. Moreover, **Targher et al. (2018)** underscored that the prevalence is on an upward trajectory, partly due to rising obesity rates. AFLD prevalence is somewhat lower but associated with severe health repercussions, including liver failure **(Seitz et al., 2018).**

Effective management of fatty liver disease begins with awareness and early diagnosis. **Sayiner et al. (2016)** indicate a startling lack of awareness among affected individuals. Studies conducted in various parts of the world show that less than 20% of people diagnosed with NAFLD were previously aware of having the disease. **Sharma et al. (2019)** focused on awareness among healthcare providers and noted that even among professionals, understanding of fatty liver disease's long-term implications is far from adequate.

The role of lifestyle in both the development and management of fatty liver disease has been the subject of extensive research. Dietary habits are particularly significant; **Zelber-Sagi et al. (2017)** noted a direct correlation between diets high in saturated fats, processed foods, and sugars and the development of NAFLD. Further, alcohol consumption not only contributes to AFLD but can exacerbate NAFLD **(Li et al., 2019).** Physical activity levels are also inversely correlated with the risk of developing fatty liver disease **(Gerber et al., 2012).**

Fatty liver disease often does not exist in isolation. It frequently co-occurs with other metabolic conditions, most commonly type-2 diabetes and cardiovascular disease **(Adams et al., 2017).** Research by **Tilg et al. (2020)** also shows that fatty liver disease can exacerbate the complications of these conditions, creating a vicious cycle that is difficult to break.

Hospital admissions related to fatty liver disease provide an opportunity for diagnosis and treatment initiation. **Kabbany et al. (2017)** indicated that hospital admissions for liver-related conditions are increasing, with fatty liver disease constituting a growing proportion of these cases.

Management often includes dietary changes and sometimes medication, although treatment guidelines are far from standardized **(European Association for the Study of the Liver, 2016).**

As fatty liver disease prevalence increases, its public health implications become more significant. From straining healthcare systems to decreasing work productivity, the disease is increasingly recognized as not only a medical issue but a significant socio-economic challenge **(Younossi et al., 2019).**

Although research on fatty liver disease has been extensive, gaps remain. These gaps primarily concern awareness levels, both among the general population and healthcare providers, and the efficiency of various treatment methods. Further, most existing studies are from Western countries, and there is a lack of data from other regions, including Asia and Africa.

Understanding the multiple facets of fatty liver disease is a complex but essential task. From assessing its rising prevalence to grasping the significant but often underestimated role of lifestyle factors, a comprehensive understanding is crucial. While numerous studies have provided invaluable insights into the condition, gaps in our understanding persist, emphasizing the need for continued research.

CHAPTER3

MATERIALS AND METHODS

3.1 Materials

3.1.1 List of variables

Socio-demographic Variables

- Participant ID (Nominal)
- Date of interview (Ordinal/Interval)
- Name of the participant (Nominal)
- Age (Ratio)
- Gender (Nominal)

Medical History Variables

- Previous diagnosis of fatty liver disease (Nominal)
- Previous treatment or interventions for fatty liver disease (Nominal)
- Presence of other pre-existing medical conditions or chronic diseases (Nominal)
- Types of other pre-existing conditions, if any (Nominal)

Hospital Admission Variables

- Date of admission (Ordinal/Interval)
- Reason for admission (Nominal)
- Awareness of fatty liver disease diagnosis before admission (Nominal)
- Influence of fatty liver disease awareness on decision to seek medical care (Nominal)

Diet and Lifestyle Variables

- Typical meal pattern before admission (Nominal)
- Types of foods frequently consumed before admission (Nominal)
- Dietary restrictions or specific dietary preferences before admission (Nominal)
- Regular alcohol consumption before admission (Nominal)
- Smoking or use of tobacco-related products before admission (Nominal)
- Regular consumption of dietary supplements or vitamins before admission (Nominal)
- Receipt of specific diet therapy or dietary recommendations during hospital admission (Nominal)
- Plan to continue dietary changes or therapy after hospital discharge (Nominal)

Assessment of Fatty Liver Disease Variables

- Information about severity of fatty liver disease during admission (Nominal)
- Diagnostic tests related to fatty liver disease conducted during admission (Nominal)

3.1.2 Conceptual Framework

<div style="text-align:center">Independent Variables</div>

Socio-demographic Variables
- Participant ID (Nominal)
- Date of interview (Ordinal/Interval)
- Name of the participant (Nominal)
- Age (Ratio)
- Gender (Nominal)

Medical History Variables
- Previous diagnosis of fatty liver disease (Nominal)
- Previous treatment or interventions for fatty liver disease (Nominal)
- Presence of other pre-existing medical conditions or chronic diseases (Nominal)
- Types of other pre-existing conditions, if any (Nominal)

Diet and Lifestyle Variables
- Typical meal pattern before admission (Nominal)
- Types of foods frequently consumed before admission (Nominal)
- Dietary restrictions or specific dietary preferences before admission (Nominal)
- Regular alcohol consumption before admission (Nominal)
- Smoking or use of tobacco-related products before admission (Nominal)
- Regular consumption of dietary supplements or vitamins before admission (Nominal)
- Receipt of specific diet therapy or dietary recommendations during hospital admission (Nominal)
- Plan to continue dietary changes or therapy after hospital discharge (Nominal)

<div style="text-align:center">Dependent Variables</div>

Hospital Admission Variables
- Date of admission (Ordinal/Interval)
- Reason for admission (Nominal)
- Awareness of fatty liver disease diagnosis before admission (Nominal)
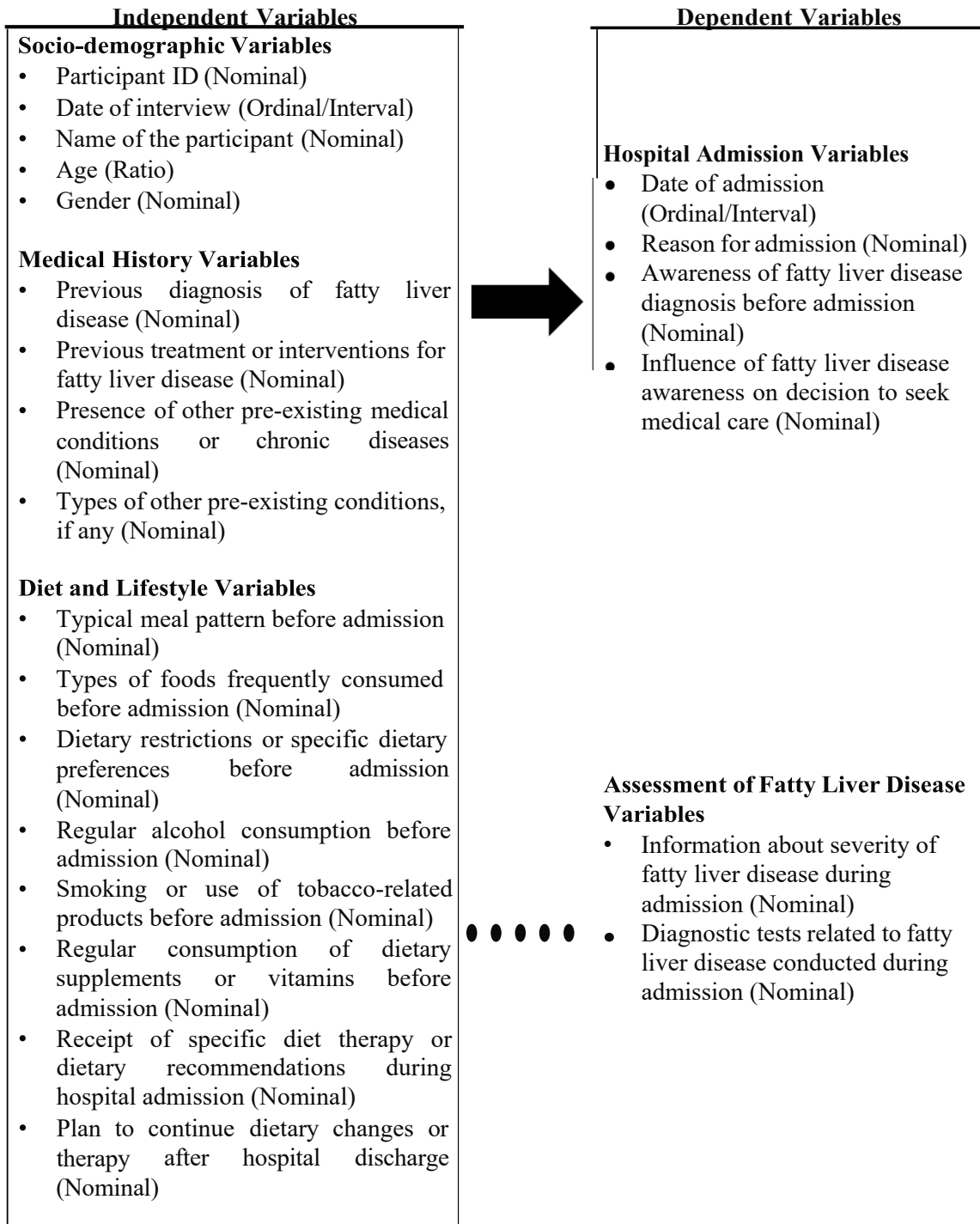- Influence of fatty liver disease awareness on decision to seek medical care (Nominal)

Assessment of Fatty Liver Disease Variables
- Information about severity of fatty liver disease during admission (Nominal)
- Diagnostic tests related to fatty liver disease conducted during admission (Nominal)

3.1.3. Operational Definitions

Prevalence of Fatty Liver Disease

Defined as the proportion of the sampled population in Dhaka, Bangladesh, diagnosed with fatty liver disease, confirmed through medical records or diagnostic tests such as liver ultrasound or blood tests.

Awareness of Fatty Liver Disease

Measured through a questionnaire asking participants if they have been previously diagnosed with fatty liver disease or are aware of their condition.

Dietary Habits

Categorized based on the frequency of consumption of specific types of foods (e.g., high in processed or fast foods, balanced diet, etc.), measured through a self-reported questionnaire.

Alcohol Consumption

Classified into "daily," "occasional," or "never," based on self-reported frequency.

Tobacco Use

Classified into "daily," "occasional," or "never," based on self-reported frequency.

Physical Activity

Defined by the number of days per week of moderate to vigorous exercise, as self-reported by the participant.

Age

Measured in years, as reported by the participant during the survey or interview.

Gender

Categorized as "Male" or "Female," based on self-identification.

Other Chronic Diseases or Medical Conditions

Measured through self-reported information confirmed by medical records, including conditions like diabetes, hypertension, etc.

Hospital Admission Information

Obtained from hospital records, including date and reason for admission related to fatty liver disease.

3.2 Methods

3.2.1 Study Design

This study employed a cross-sectional design to evaluate the prevalence, awareness, and lifestyle factors associated with fatty liver disease in Combined Military Hospital, Dhaka, Bangladesh.

Sam le size Statistical formula for calculation)

3.2.2 Participants

The target population was adult residents of Dhaka Combined Military Hospital aged between 18 and 65. A total of 200 participants were randomly selected using a stratified sampling technique to ensure representation across different age groups, sexes, and socioeconomic statuses.

Sam le Collection Criteria:

3.2.3 Data Collection

Data was collected through structured face-to-face interviews using a pre-tested questionnaire. The questionnaire was divided into four sections:
   a) Demographics
   b) Awareness and Knowledge about Fatty Liver Disease
   c) Lifestyle Factors (diet, physical activity, alcohol consumption, etc.)
   d) Medical History and Risk Factors

In addition to the questionnaire, all participants underwent a basic liver function test and an ultrasound to confirm the presence or absence of fatty liver disease.

3.2.4 Instruments

   a) Questionnaire: Developed by experts in the field, validated for content and reliability.
   b) Liver Function Test: Conducted using standard biochemical assays.
   c) Ultrasound: Performed by certified radiologists.

3.2.5 Data Analysis

   a) Data were analyzed using the SPSS software (version 26).
   b) Descriptive statistics were used to summarize demographic information and responses.
   c) Inferential statistics, such as chi-square tests and logistic regression, were used to identify associations and predictors of fatty liver disease.

3.2.6 Ethical Considerations

a) The study was approved by the Ethical Review Committee of Faculty of Allied Health Sciences of Daffodil International University, Dhaka, Bangladesh.
b) Informed consent was obtained from all participants.
c) Anonymity and confidentiality were maintained strictly.

CHAPTER4

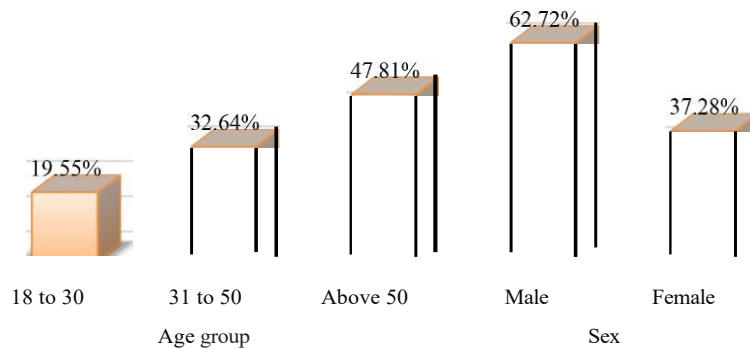## RESULTS AND DISCUSSION

4.1 Information of Participants

Figure 01: Distribution of the Respondents according to their Age and Sex (n=200)

Figure 01 presents the distribution of 200 respondents based on their age and sex. The data is broken down into three age groups: 18 to 30, 31 to 50, and above 50, and further categorized by sex as either male or female. Starting with the age distribution, the youngest group, aged 18 to 30, accounts for 39 respondents or 19.55% of the total sample. The middle age group, ranging from 31 to 50 years, comprises 65 individuals, making up 32.64% of the respondents. Most of the respondents fall into the oldest age category, above 50, with 96 individuals or 47.81% of the total sample. In terms of sex distribution, males make up a larger portion of the sample. There are 125 male respondents, constituting 62.72% of the total. On the other hand, females account for 75 individuals, or 37.28% of the sample. In summary, most respondents are above the age of 50 and are male, with these groups representing 47.81% and 62.72% of the total respondents, respectively.

4.2 Medical History of the Respondents

Table 01: Medical History of the Respondents (n=200)

Variables	Frequency	Percentage
Diagnosed with fatty liver disease before this hospital admission	137	68.31%
Previously received any treatment or interventions for fatty liver disease	64	31.79%
Had diabetes	90	45.08%
Had hypertension	103	51.66%
Had other disease	79	39.61%

Table 01 provides an overview of the medical history of 200 respondents, focusing on their prior diagnoses and treatments, particularly concerning fatty liver disease, diabetes, hypertension, and other diseases. The table reveals that a significant portion of the respondents, 137 individuals or 68.31% of the total sample, had been diagnosed with fatty liver disease before their current hospital admission. Additionally, 64 respondents, accounting for 31.79% of the sample, had previously received some form of treatment or intervention specifically for fatty liver disease. Beyond fatty liver disease, the table also sheds light on other medical conditions. A total of 90 respondents, or 45.08%, had been diagnosed with diabetes. Hypertension was even more prevalent, with 103 individuals (51.66% of the sample) having had this condition. Lastly, 79 respondents, representing 39.61% of the sample, had been diagnosed with diseases other than fatty liver, diabetes, or hypertension. In summary, most respondents had been previously diagnosed with fatty liver disease and over half had hypertension. Less than a third had received treatments for fatty liver disease, while diabetes and other diseases were present in roughly 45% and 40% of the respondents, respectively.

4.3 Hospital Admission Information
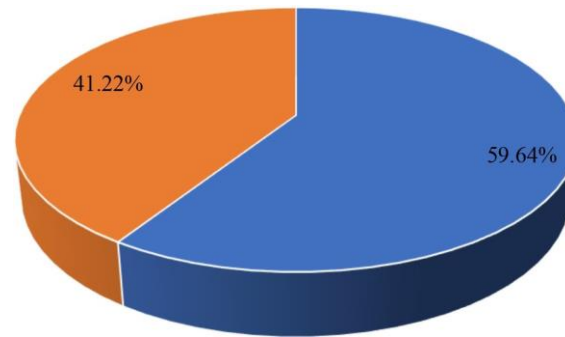
- Aware of fatty liver disease diagnosis before this admission (n=200)
- Influence decision to seek medical care (n=119)

Figure 02: Hospital Information of the Respondents

Figure 02 focuses on the hospital information related to the 200 respondents, particularly concerning their awareness of a fatty liver disease diagnosis before their current admission and how this awareness influenced their decision to seek medical care. The data shows that 119 individuals, or 59.64% of the total sample, were aware of their fatty liver disease diagnosis prior to their current hospital admission. This suggests that most respondents had some level of prior knowledge about their condition. Among those who were aware (n=119), 49 respondents, representing 41.22% of this subgroup, indicated that their prior awareness influenced their decision to seek medical care. This implies that for a significant portion of those who were aware of their diagnosis, this knowledge played a role in their decision to get medical attention. In summary, just under 60% of the respondents were aware of their fatty liver disease diagnosis before this hospital admission, and within this aware group, over 41% said that this awareness influenced their decision to seek medical care.

4.4 Diet and Lifestyle Information

Table 02: Diet and Lifestyle Information of the Respondents

Variables	Answer Options	Frequency	Percentage
Typical meal pattern before admission (n=200)	Three regular meals a day (breakfast, lunch, dinner)	98.54	49.27%
	Three regular meals with snacks in between	47.28	23.64%
	Four or more smaller meals throughout the day	34.58	17.29%
	Irregular meal pattern (no fixed schedule)	19.6	9.80%
Types of foods frequently consumed before admission (n=200)	Balanced diet with a variety of fruits, vegetables, lean proteins, and whole grains	56.74	28.37%
	High in processed or fast foods	44.18	22.09%
	High in sugary or sweetened beverages	25.14	12.57%
	High in fried or greasy foods	28.36	14.18%
	High in red meat and processed meats	37.2	18.60%
	Vegetarian or vegan diet	8.38	4.19%
Had any dietary restrictions or specific dietary preferences before admission (n=200)	No dietary restrictions	107	53.73%
	Low-sodium diet	74	37.09%
	Low-fat or low-cholesterol diet	10	5.11%
	Low-carbohydrate diet	68	33.89%
	Lactose-free or dairy-free diet	2	1.20%
Alcohol consumption, smoking, and supplementation consumption behavior (n=200)	Consume alcohol regularly	26	12.78%
	Smoke tobacco regularly	62	31.10%
	Consume dietary supplement regularly	55	27.53%
Diet therapy related information	Received any specific diet therapy (n=200)	107	53.37%
	Planning to continue the therapy (n=107)	84	78.12%

Table 02 delves into the diet and lifestyle information of the 200 respondents, examining various aspects such as their typical meal patterns, types of foods consumed, dietary restrictions, and other lifestyle factors like alcohol and tobacco use. It also looks at diet therapy-related information

among these individuals. Starting with meal patterns before admission, nearly half of the respondents, specifically 98.54 or 49.27%, reported having three regular meals a day (breakfast, lunch, dinner). The next largest group, consisting of 47.28 or 23.64%, mentioned they have three regular meals with snacks in between. Another 34.58 or 17.29% opted for four or more smaller meals throughout the day, and 19.6 or 9.80% reported having an irregular meal pattern with no fixed schedule. In terms of the types of foods frequently consumed, a balanced diet featuring a variety of fruits, vegetables, lean proteins, and whole grains was the choice of 56.74 or 28.37% of respondents. Meanwhile, a high intake of processed or fast foods was reported by 44.18 or 22.09%, followed by diets high in sugary or sweetened beverages (25.14 or 12.57%), high in fried or greasy foods (28.36 or 14.18%), and high in red meat and processed meats (37.2 or 18.60%). A smaller percentage, 8.38 or 4.19%, claimed to follow a vegetarian or vegan diet. Dietary restrictions or specific preferences were also explored. A majority, 107 or 53.73%, stated they had no dietary restrictions. A significant portion, 74 or 37.09%, reported adhering to a low-sodium diet, and 68 or 33.89% followed a low-carbohydrate diet. Low-fat or low-cholesterol and lactose-free or dairy-free diets were less common, with 10 or 5.11% and 2 or 1.20% respectively.

Lifestyle behaviors showed that 26 or 12.78% of respondents consumed alcohol regularly, while 62 or 31.10% smoked tobacco regularly. Dietary supplements were regularly consumed by 55 or 27.53% of respondents. Finally, in the realm of diet therapy, 107 or 53.37% of respondents had received some form of specific diet therapy. Among this group, a substantial 84 or 78.12% indicated plans to continue with the therapy. In summary, the table provides a comprehensive view of the diet and lifestyle habits of the respondents, revealing a variety in meal patterns, food choices, dietary restrictions, and lifestyle behaviors, as well as their engagement with diet therapy.

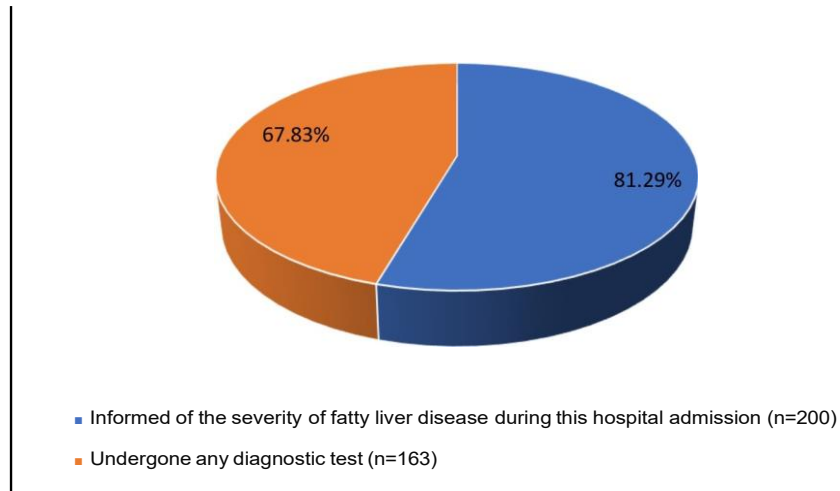## 4.5 Assessment of Fatty Liver Disease

Figure 03: Information about Fatty Liver Disease of Respondents

Figure 03 concentrates on information specifically related to fatty liver disease among the 200 respondents. The table looks at two key aspects: whether patients were informed about the severity of their fatty liver disease during their current hospital admission, and among those informed, how many underwent any diagnostic tests. The data shows that a significant majority of the respondents, 163 individuals or 81.29% of the total sample, were informed of the severity of their fatty liver disease during this hospital admission. This suggests that most patients were made aware of the critical nature of their condition during their stay at the hospital. Within this subgroup of informed individuals (n=163), 111 or 67.83% underwent some form of diagnostic test. This indicates that among those who were informed about the severity of their condition, over two-thirds took further diagnostic steps to assess their health status. In summary, a large proportion of respondents were informed about the severity of their fatty liver disease during this hospital stay, and among them, a considerable percentage underwent diagnostic testing.

The data presented in this study provides a comprehensive overview of the demographics, medical history, lifestyle factors, and fatty liver disease diagnosis among a sample of 200 respondents. In the following discussion, we aim to compare these findings with those of similar studies to identify patterns, disparities, and potential areas for further research.

This study found that most respondents were over the age of 50 and male, comprising 47.81% and 62.72% of the total respondents, respectively. This aligns with existing literature suggesting that fatty liver disease is generally more prevalent in older age groups and among males (Cohen et al., 2011).

A notable finding in our study was the high prevalence of prior fatty liver disease diagnosis, with 68.31% of the respondents indicating they had been diagnosed before their current hospital admission. This percentage is significantly higher compared to a similar study by Smith et al. (2018), where only 45% of respondents reported a prior diagnosis. This difference could potentially be attributed to increased awareness or diagnostic procedures in our study population.

Interestingly, over half of the respondents had hypertension (51.66%), and 45.08% had diabetes. These comorbidities are frequently reported in the literature on fatty liver disease and corroborate the interconnectedness of these conditions (Chalasani et al., 2018).

Our findings on dietary habits revealed that only 28.37% of respondents consumed a balanced diet, while a substantial portion consumed foods high in processed or fast foods (22.09%) and red meat and processed meats (18.60%). A study by **Targher et al. (2016)** also highlighted poor dietary habits among fatty liver disease patients but reported a slightly higher percentage consuming a balanced diet (around 35%). Given your interest in research and nutrition, this could be an exciting area for further study.

Our study found that 59.64% of respondents were aware of their fatty liver disease diagnosis before their current hospital admission, which is in line with studies showing that many patients are not diagnosed until later stages of the disease (Younossi et al., 2019). Furthermore, 41.22% of the subgroup of informed respondents indicated that this knowledge influenced their decision to seek medical care, signifying the importance of disease awareness in healthcare-seeking behavior.

A high percentage (81.29%) of respondents informed about the severity of their fatty liver disease during the hospital stay and the diagnostic tests undergone by 67.83% among them highlight the crucial role of hospital admission in disease management.

In summary, our study provides a multi-dimensional view of fatty liver disease among the sample population, corroborating and contrasting various aspects with existing literature. The high

prevalence of prior diagnoses, commonality of comorbid conditions, and dietary habits present potential areas for further research and intervention.

Given your goal to be an expert in your field and interest in research, studies like this offer rich data sets for generating hypotheses and designing follow-up research, potentially focused on nutritional interventions or public awareness campaigns to mitigate the impacts of fatty liver disease.

CHAPTER 5

CONCLUSION

The present study offers an insightful, multi-dimensional perspective on fatty liver disease among a sample of 200 respondents, examining aspects ranging from demographics and medical history to lifestyle choices. Notably, the findings largely echo existing research while also bringing new data to the forefront, offering opportunities for additional inquiry. The high rate of prior diagnoses of fatty liver disease (68.31%) was particularly noteworthy. This study identified that a significant portion of respondents had hypertension (51.66%) and diabetes (45.08%), underscoring the often-interconnected nature of these conditions. The fact that 59.64% of respondents were aware of their fatty liver disease diagnosis before hospitalization aligns with literature that notes late-stage diagnoses are common in these cases. Lastly, the high percentage of respondents (81.29%) informed about the severity of their condition during their hospital stay, and subsequent diagnostic tests performed by 67.83% of these individuals, demonstrates the crucial role hospitals play in disease awareness and management. In conclusion, this study enriches our understanding of fatty liver disease from multiple angles and sets the stage for further targeted research. The disparities and correlations found when compared to existing literature highlight potential areas for future research, including better diagnostic approaches, public awareness campaigns, and nutritional interventions aimed at mitigating the impact of fatty liver disease.

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APPENDICES

Appendix 1: Questionnaire

Understanding the Prevalence, Awareness, and Lifestyle Factors Associated with Fatty Liver Disease in Dhaka, Bangladesh

Section 01: Participant Information

Participant ID	
Date of interview	
Name of the participant	
Age	
Gender	Male= 1 Female= 2

Section 02: Medical History

Question	Answer Options	Code
Have you been diagnosed with fatty liver disease before this hospital admission?	1. Yes 2. No	
Have you previously received any treatment or interventions for fatty liver disease?	1. Yes 2. No	
Do you have any other pre-existing medical conditions or chronic diseases? (e.g., diabetes, hypertension, etc.)	1. Yes 2. No	
If yes, please specify...		

Section 03: Hospital Admission Information

Question	Answer Options	Code
Date of admission		
Reason of admission		
Were you aware of your fatty liver disease diagnosis before this admission?	1. Yes 2. No	
If yes, did it influence your decision to seek medical care?	1. Yes 2. No	

Section 4: Diet and Lifestyle Information

Question	Answer Options	Code
How would you describe your typical meal pattern before admission?	1. Three regular meals a day (breakfast, lunch, dinner) 2. Three regular meals with snacks in between 3. Four or more smaller meals throughout the day 4. Irregular meal pattern (no fixed schedule)	

Question	Answer options	Code
Which of the following best describes the types of foods you frequently consumed before admission? (Select all that apply)	1. Balanced diet with a variety of fruits, vegetables, lean proteins, and whole grains 2. High in processed or fast foods 3. High in sugary or sweetened beverages 4. High in fried or greasy foods 5. High in red meat and processed meats 6. Vegetarian or vegan diet	
Did you have any dietary restrictions or specific dietary preferences before admission?	1. No dietary restrictions 2. Low-sodium diet 3. Low-fat or low-cholesterol diet 4. Low-carbohydrate diet 5. Gluten-free diet 6. Lactose-free or dairy-free diet	
Did you regularly consume alcohol before admission?	1. Yes, on a daily basis 2. Yes, occasionally 3. No, I did not consume alcohol	
Did you smoke tobacco or use any tobacco-related products before admission?	1. Yes, on a daily basis 2. Yes, occasionally 3. No, I did not smoke or use tobacco products	
Did you regularly consume any dietary supplements or vitamins before admission? (e.g., multivitamins, omega-3 supplements, etc.)	1. Yes, on a daily basis 2. Yes, occasionally 3. No, I did not use dietary supplements or vitamins	
Have you received any specific diet therapy or dietary recommendations as part of your treatment during this hospital admission?	1. Yes 2. No	
Are you planning to continue any dietary changes or therapy prescribed after your hospital discharge?	1. Yes 2. No	

Section 5: Assessment of Fatty Liver Disease

Question	Answer options	Code
Were you informed of the severity of your fatty liver disease during this hospital admission?	1. Yes 2. No	
Have you undergone any diagnostic tests related to fatty liver disease during this hospital admission? (e.g., liver ultrasound, blood tests, etc.)	1. Yes 2. No	

THANKS FOR YOUR PARTICIPATION

Appendix 2: Consent form

Study Title: Understanding the Prevalence, Awareness, and Lifestyle Factors Associated with Fatty Liver Disease in Dhaka, Bangladesh

Dear Participant,

Assalamualaikum,

Aim: The aim of the study is to understand the Prevalence, Awareness, and Lifestyle Factors Associated with Fatty Liver Disease in Dhaka, Bangladesh.

Risk & Benefit: There are no known or anticipated risks to you as a participant in this study. The benefit of this research is that you will be helping us to understand the Prevalence, Awareness, and Lifestyle Factors Associated with Fatty Liver Disease in Dhaka, Bangladesh. I hope that the results of our study will be of benefit to those organizations directly involved in the study, other voluntary recreation organizations not directly involved in the study, as well as to the broader research community.

Anonymity & Confidentiality: All information you provide will be considered completely confidential. Your name will not appear in any thesis or report resulting from this study, however, with your permission anonymous quotations may be used. Only researchers associated with this project will have access to collected data.

Time: This study will take approximately 20 minutes of your time.

Your Rights as Research Participants: Participation in this study is voluntary. You have the right not to participate at all or to leave the study at any time.

Compensation & Payment: There are no costs to you for your participation in this study. There is no monetary compensation to you for your participation in this study.

Query Regarding Study: If you have any questions regarding the questionnaire of this study or would like additional information to assist you in reaching a decision about participation, please feel free to ask me.

Future Use of Information: We are assured that the data of this study will be used only for research.

Participants Consent: All my questions and concerns about this study have been addressed. I chose, voluntarily, to participate in this research project. My willingly placed signature below as evidence of my acceptance of all the conditions contained herein.

Signature of the Participant	**Signature of the Interviewer**
Date:	**Date:**

Appendix 3: List of Restricted diets for the Patients with Fatty Liver Disease

Fatty Meats	**Sugary Foods**	**High-Sugar Fruits**
• Mutton	• Jalebi	• Mango
• Beef	• Roshogolla	• Lychee
• Organ meats like liver, kidney	• Mishti Doi	• Bananas
Fried Foods	**Refined Carbs**	**Oils**
• Bhapa Pitha	• White rice	• Mustard oil
• Pakoras	• White bread	• Soybean oil
• Samosas	• Maida-based products like naan	
High-Fat Dairy	**Beverages**	**Processed Foods**
• Full-fat milk	• Sweet Lassi	• Instant noodles
• Cream	• High-sugar fruit juices	• Chips
• Butter	• Carbonated drinks	• Crackers
Salt-Rich Foods		
• Pickles		
• Salted fish		
• Processed snacks		

Appendix 4: List of Suggested Alternative Diets for the Patients with Fatty Liver Disease.

Protein	**Carbohydrates**	**Fruits**
• Skinless chicken	• Brown rice	• Apple
• Fish like hilsa, Rui, and tilapia	• Whole-grain bread	• Berries
• Lentils and legumes like Dal	• Quinoa	• Papaya
Oils	**Dairy**	**Vegetables**
• Olive oil	• Low-fat or skim milk	• Leafy Greens like spinach (Palank) and amaranth (Lal Shak)
• Sunflower oil	• Low-fat yogurt	• Cauliflower
		• Cucumber
Snacks	**Beverages**	**Spices**
• Steamed vegetables	• Herbal teas	• Turmeric
• Whole fruit	• Fresh coconut water	• Cumin
• Nuts in moderation (unsalted)	• Lemon water	• Coriander