PREVALENCE OF FATTY LIVER DISEASE AND ASSOCIATED FACTORS AMONG OUTPATIENTS AT MUHAS ACADEMIC MEDICAL CENTRE

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PREVALENCE OF FATTY LIVER DISEASE AND ASSOCIATED FACTORS AMONG OUTPATIENTS AT MUHAS ACADEMIC MEDICAL CENTRE

By

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A Dissertation Submitted in partial Fulfillment of the Requirements for the Degree of Master of Medicine Internal Medicine of

Muhimbili University of Health and Allied Sciences
October, 2019

CERTIFICATION

The undersigned certify that he has read and hereby recommend for submission by the Muhimbili University of Health and Allied Sciences a dissertation entitled: "***The Prevalence of Fatty Liver Disease and Associated Factors among outpatients attending Internal Medicine clinic at Muhas Academic Medical Center****"* in partial fulfillment of the requirements for the degree of Master of Medicine (Internal Medicine) of the Muhimbili University of Health and Allied Sciences.

…….

Dr. Ewaldo V. Komba MD, MMED, Msc.

(Supervisor)

……

Date

DECLARATION & COPYRIGHT

I, **Nontobeko Nokulunga Simelane** declare that this **dissertation** is my own original work; it has not been presented and will not be presented to any other university for a similar or any other degree award.

Signature…… Date……

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DEDICATION

To my late father E.V. who encouraged me to study medicine, we had a plan dad!

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ABSTRACT

Background: Fatty liver disease has become an important cause of chronic liver disease and an alarming public health problem. Several studies around the globe have revealed the prevalence of fatty liver disease to range between 10% and 63.5%. In recent times, fatty liver disease has gained global prominence because of its associated increased risk of end-stage liver disease, liver failure and hepatocellular carcinoma. In general, patients with fatty liver disease have increased all-cause mortality and liver-related mortality compared to the general population thus its prevention, diagnosis, and management is crucial in any given population. There is limited information regarding fatty liver disease in a Tanzanian population.

Objective: To determine the prevalence, awareness and associated factors for fatty liver disease among outpatients at MUHAS Academic Medical Centre.

Methodology: A cross-sectional study conducted from June 2018 to November 2018 at MUHAS Academic Medical Centre – Dar es Salaam, Tanzania. Consenting patients attending internal medicine clinics were interviewed, examined and investigated. Socio-demographic information, clinical, laboratory, and assessment of awareness about fatty liver disease parameters were gathered during the interviews. Fatty liver disease was identified with ultrasound imaging. Continuous variables were compared with the use of student's t-test and categorical data with the use of chi-squared test. To assess for associated factors, we performed logistic regression analyses, $p<0.05$ was used to denote significance.

Results: A total of 432 outpatients were enrolled. The prevalence of fatty liver disease was 13.9%. An overwhelming majority of the subjects stated that their physicians did not have a discussion about fatty liver disease. Independent associated factors of fatty liver disease were the male gender, having diabetes mellitus, waist circumference >99M/80F, high total cholesterol >220mg/dl, high triglycerides >170mg/dl, and low HDL < 40mg/dl.

Conclusion: Fatty liver disease is not uncommon among outpatients in Tanzania. A significant number of people among the general community have never had a discussion about fatty liver disease with their physician. Factors that were associated with fatty liver

disease in this current setting were similar to the ones reported in several other settings around the globe. Several strategies to improve health education are vital. Early diagnosis and timely management of fatty liver disease will certainly improve the quality of life and its expectancy at large.

TABLE OF CONTENTS

CERTIFICATION i
DECLARATION & COPYRIGHT ii
ACKNOWLEDGEMENT iii
DEDICATION iv
ABSTRACT v
List of Figures ix
List of Tables ix
LIST OF ABBREVIATIONS x
DEFINITION OF TERMS xi
CHAPTER ONE 1
1.0 INTRODUCTION 1
1.1 Background 1
1.2 Literature Review 4
1.3 Conceptual Framework 6
CHAPTER TWO 6
2.0 PROBLEM STATEMENT AND OBJECTIVES 7
2.1 Problem Statement 7
2.2 Rationale 7
2.3 Research Questions 7
2.4 Hypothesis 7
2.5 Objectives 8
2.5.1 Broad Objective 8
2.5.2 Specific Objectives 8
CHAPTER THREE 9
3.0 METHODOLOGY 9
3.1 Study design 9
3.2 Study Period 9
3.3 Study Setting 9
3.4 Study Population 9
3.5 Inclusion criteria 9
3.6 Exclusion criteria 9

3.7 Sample size determination 10
3.8 Sampling technique 10
3.9 Data collection procedure 10
3.9.1 Awareness assessment 11
3.9.2 Clinical measurements 11
3.9.3 Laboratory procedure 13
3.9.4 Abdominal Ultrasound 14
3.10 Study Variables 14
3.11 Data processing and analysis 15
3.12 Ethical consideration 15
3.13 Disposal of Study Patients 16
CHAPTER FOUR 17
4.0 RESULTS 17
4.1 Descriptive Findings 17
4.2 The prevalence of fatty liver disease 19
4.3 Assessment of awareness of patients about FLD 20
4.4 Determination of the associated factors for fatty liver disease 21
CHAPTER FIVE 23
5.0 DISCUSSION, STRENGTHS AND LIMITATIONS 23
5.1 Discussion 23
5.2 Study Strengths and Limitations 25
CHAPTER SIX 26
6.0 CONCLUSIONS AND RECOMMENDATIONS 26
6.1 Conclusions 26
6.2 Recommendations 26
7.0 REFERENCES 27
8.0 APPENDICES 34
8.1 Consent form (English version) 34
8.2 Consent form (Swahili version) 35
8.3 Questionnaire (English Version) 36
8.4 Questionnaire (Swahili Version) 41

LIST OF FIGURES

Figure 1. Conceptual framework showing interaction of risk factors and comorbidities that are associated with fatty liver disease and the possible complications that may be caused by fatty liver disease..... 6

Figure 2:The distribution of gender with fatty liver disease among outpatients attending internal medicine clinics at MAMC..... 19

Figure 3:The grades of fatty liver disease among outpatients attending internal medicine clinics at MAMC..... 19

LIST OF TABLES

Table 1: Socio-demographic and clinico-laboratory correlates of Study Population.....18

Table 2: Awareness of FLD among study participants 20

Table 3:The associated factors of fatty liver disease among outpatients attending internal medicine clinics at MAMC. 21

Table 4: Multivariate logistic regression 22

LIST OF ABBREVIATIONS

AASLD	-	American Association for the Study of Liver Diseases
AFLD	-	Alcoholic Fatty Liver Disease
ALT	-	Alanine Aminotransferase
AST	-	Aspartate Aminotransferase
BMI	-	Body Mass Index
CTC	-	Care and Treatment Clinic
FLD	-	Fatty Liver Disease
HBsAg	-	Hepatitis B surface antigen
Hep CAb	-	Hepatitis C antibodies
HDL	-	High Density Lipoprotein
HIV	-	Human Immunodeficiency Virus
HS	-	Hepatic Steatosis
MAMC	-	MUHAS Academic Medical Centre
MUHAS	-	Muhimbili University of Health and Allied Sciences
NAFLD	-	Non- Alcoholic fatty Liver Disease
USS	-	Ultrasound Sonography

DEFINITION OF TERMS

For the purpose of this study, the following definitions were used:

Hypertension: Is defined as systolic BP > 140 mmHg and/or diastolic BP > 90 mmHg, or patients who are already on antihypertensive medications regardless of their BP.

Dyslipidemia: Is defined as deranged serum lipid profile, either raised total or low density lipid cholesterol, raised triglycerides and/or low high density lipid cholesterol.

Diabetes mellitus: Is defined as per the International Diabetes Federation criteria i.e. using the sugar cut-off level of <7.0mmol/L and 11.0mmol/L for fasting and random blood sugar levels respectively or use of sugar lowering medications.

Significant Alcohol intake: Is defined as alcohol consumption of up to 21 units per week for males, and 14 units per week for females for a period of more than 2 years. Whereby 1 unit was equated to 1 beer (500mls) of 5% alcohol strength or its equivalence.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Fatty liver disease is a spectrum of clinical and pathological conditions characterized by excessive (>5%) lipid (mainly triglycerides) deposition in the liver parenchyma regardless of any cause of hepatic diseases such as viral hepatitis, alcohol consumption and metabolic diseases (1–3). It is associated with a myriad of non-hepatic consequences including increased risk of cardiovascular disease, coronary artery disease, and peripheral vascular disease (4–6). Non-alcoholic fatty liver disease (NAFLD), the presence of fat infiltration in the liver in the absence of excessive alcohol consumption (>21 units/week or >60-80 g/day of alcohol for 2-10 years or longer in men, and >14 units/week or >20 g/day in women)(7) and other causes of liver disease, is the most common cause of fatty liver, with a prevalence as high as 30% in many populations (8). Conventionally, fatty liver has been considered a benign and reversible non-specific response of the liver to metabolic stress. However, in our current understanding fatty liver disease encompasses a broad pathological spectrum ranging between simple hepatic steatosis (fatty liver), steatohepatitis (fatty liver with inflammation), fibrosis, cirrhosis, and hepatocellular carcinoma. For instance, about 10-20% of patients with non-alcoholic fatty liver disease will progress to steatohepatitis and up-to 5% will develop cirrhosis. Among steatohepatitis patients with concomitant cirrhosis, a 3%/year rate of hepatocellular carcinoma is observed (9).

Pathophysiology and Predisposing factors for Fatty Liver Disease

The pathophysiology of fatty liver disease has not been fully elucidated due to its complexity and multifactorial nature. Initial proposed theories for the pathogenesis were based on a ‘2-hit hypotheses. The ‘first hit’ involved accumulation of triglycerides in the hepatocytes which increases susceptibility of the liver to injury mediated by the ‘second-hits’. Second-hits included inflammatory cytokines/adipokines, mitochondrial dysfunction and oxidative stress, which eventually lead to steatohepatitis and/or fibrosis (10,11). Nevertheless, this theory has been modified due to increasing evidence that free fatty acids play a direct role in promoting liver injury (12). For instance, in obesity and insulin resistance, there is an increased influx of free fatty acids to the liver. These fatty acids undergo either esterification with glycerol or beta-oxidation which ultimately lead to

hepatic fat accumulation which can cause toxicity by increasing oxidative stress and by activation of inflammatory pathways (13,14).

Furthermore, a 'third-hit' that reflects inadequate hepatic proliferation is now included in the pathogenesis of fatty liver disease. In fatty liver disease, oxidative stress inhibits the replication of mature hepatocytes to replace the dead cells thus resulting in expansion of the hepatic progenitor cell population (14).

Clinical Presentation and Diagnosis of Fatty Liver Disease

Majority of persons with fatty liver disease are asymptomatic and diagnosis is usually reached incidentally during routine haematological and radiological tests, or assessment of cardiovascular risk (15). Liver biopsy remains the gold standard for diagnosis of fatty liver disease. However, this method has some disadvantages including cost and invasiveness. **Owing to** their limitations, several non-invasive markers/tests including biochemical tests (aminotransferase levels) and hepatic imaging (ultrasonography, computed tomography, and magnetic resonance imaging) are used in routine daily practice for diagnostic purposes. In a meta-analysis study by Hernaez R et al, they showed that ultrasound is an accurate, reliable imaging technique for detection of fatty liver, as compared with histology, with a pooled sensitivity of 84.8%, a pooled specificity of 93.6% for detecting >20%-30% steatosis (3). Because ultrasound is relatively inexpensive and accessible, compared to other diagnostic techniques, their results suggest that ultrasound may be the imaging technique of choice for screening for the presence of fatty liver in clinical settings and, especially, population studies. The widespread use of ultrasound to detect fatty liver may help better identify the determinants and natural history of fatty liver disease in the general population and may help target interventions directed to reducing the complications associated with fatty liver (3).

Awareness of Fatty Liver Disease

Studies done among outpatient, high risk and the general population have revealed poor awareness of FLD. In a study by Wieland AC et al to assess awareness of nonalcoholic fatty liver disease as a disease entity among individuals with and without metabolic risk factors in an outpatient endocrinology clinic. Overall, 18% of all respondents reported awareness of NAFLD. Even among patients with self-reported major risk factors for

NAFLD (overweight/obese, insulin resistant, or both overweight/obese and insulin resistant), the rates of awareness of NAFLD were low (19%, 23%, and 24%, respectively). And a majority of survey respondents expressed interest in receiving patient-centered education on NAFLD (73%)(16).

Another study by Goh G et al, on perceptions of FLD among attendees at a gastroenterology public forum. While the majority of subjects (71.2%) had heard about NAFLD before, only 25.4% of them felt that they were at risk of NAFLD. Surprisingly, 75.6% of subjects with one or more metabolic risk factors did not think that they were at risk of NAFLD (17).

In a study by Ghevariya V. et al a majority of the participants had little awareness of NAFLD regardless of their age, gender, or educational status. Vast majority (98%) of them stated that their physicians never mentioned NAFLD to them (18). Also a study in Hong Kong by Leung C. et showed that 83% of respondents had never come across the term 'NAFLD' and 47% knew nothing about the clinical presentation of NAFLD. About 78% had a misconception that blood tests could provide a definite diagnosis of NAFLD. Smoking, hepatitis B carriage and a past history of hepatitis A infection were cited as risk factors of NAFLD by 52%, 57% and 42% of respondents, respectively (19).

Management and Prognosis of Fatty Liver Disease

There is paucity of data regarding the management and resolution of fatty liver disease. The lack of long-term follow-up and sparse biopsy data on large population-based studies further confounds the data paucity. To date, the most compelling data has come from the bariatric surgery population. For example, in a study by Silverman et al, hepatic fat infiltration was reduced in 71% of patients biopsied at time of bariatric surgery and at follow-up (20). In another study by Mottin et at, 18% remained at the same degree of steatosis, 28% showed improvement in steatosis, and in 54% normal hepatic tissue was restored by the time of second biopsy (21). However, lifestyle modification consisting of diet, exercise, and weight loss has been advocated to treat patients with NAFLD, as well as abstinence from alcohol has been recommended by the AASLD (22).

1.2 Literature Review

Burden and Epidemiology of Fatty Liver Disease

The epidemiology of fatty liver disease is increasingly an area of interest globally. Several studies have produced variable prevalence's for this condition mainly due to differences in population specifics and methods use to assess fatty liver. Nevertheless, fatty liver disease prevalence is evidently significant across the globe. For instance, the prevalence of non-alcoholic fatty liver in the Americas is estimated to range between 20% and 30% (15,23). A study done in Thailand produced similar results with prevalence ranging between 18.3% to 22.9% (24). Several other studies done elsewhere around the globe have revealed prevalence of non-alcoholic fatty liver disease to range between 10% and 63.5% (6,25–33). On the other hand, prevalence of alcoholic fatty liver disease has been reported to range from 12.5% - 42.2% (34,35). In the African continent, there is scanty of data regarding fatty liver disease. A study by Onyekwere revealed a prevalence of 8.7% among patients attending an urban hospital (36). Another study from Nigeria which involved Diabetes patients produced a prevalence of 16.7% (2).

Socio-demographic characteristics of Fatty Liver Disease

Age, Sex and Ethnicity

Fatty liver disease affects all ages; however, disease trend shows increased incidence with aging (37). Gender differences and its associated risk for fatty liver disease remain an area of controversy as thus far existing studies have produced conflicting results. While some studies have reported a female predominance (37,38), there is a growing body of literature suggesting higher prevalence in the male gender (39,40). Ethnicity is an important predictor of complications and response to treatment in chronic liver disease (15,41–43). Fatty liver disease affects all ethnic groups, however, American studies have shown that Hispanics have the highest prevalence and African Americans have the lowest prevalence (15,41–43).

Genetics

Genetic factors have been shown by family and interethnic variation studies to be important risk determinants of the susceptibility and severity of fatty liver disease (44). Lipid metabolism, cytokine regulation, fibrotic mediators, and oxidative stress are affected by multiple polymorphisms in genes which may be associated with the development and progression of fatty liver disease (44). For instance, studies have shown that polymorphism in the PNPLA3 gene predicts the extent of liver fat accumulation and the susceptibility to a more aggressive disease (45).

Associated Factors

Lifestyle-related factors

Several environmental and lifestyle-related factors have been associated with fatty liver disease. BMI and waist circumference have been shown to be strong predictors of fatty liver disease. Fatty liver disease is often associated with significant alcohol consumption and metabolic risk factors including obesity, insulin resistance/type 2 diabetes mellitus, and dyslipidemia. Based on these associations, this disease is regarded as the hepatic manifestation of the metabolic syndrome (25,46). For instance, the prevalence of fatty liver disease among morbidly obese individuals is estimated to be high (47). Furthermore, over three quarters of diabetic patients are reported to have fatty liver disease. As observed in the study by Yimaz et al, up-to 80% of persons with fatty liver disease have at least one component of the metabolic syndrome (48,49). Moreover, long-term use of several drugs including; amiodarone, griseofulvin, methotrexate, tamoxifen, estrogens, corticosteroids, aspirin, calcium channel blockers and NRTIs have been shown to increase the risk of fatty liver disease (50,51).

1.3 Conceptual Framework

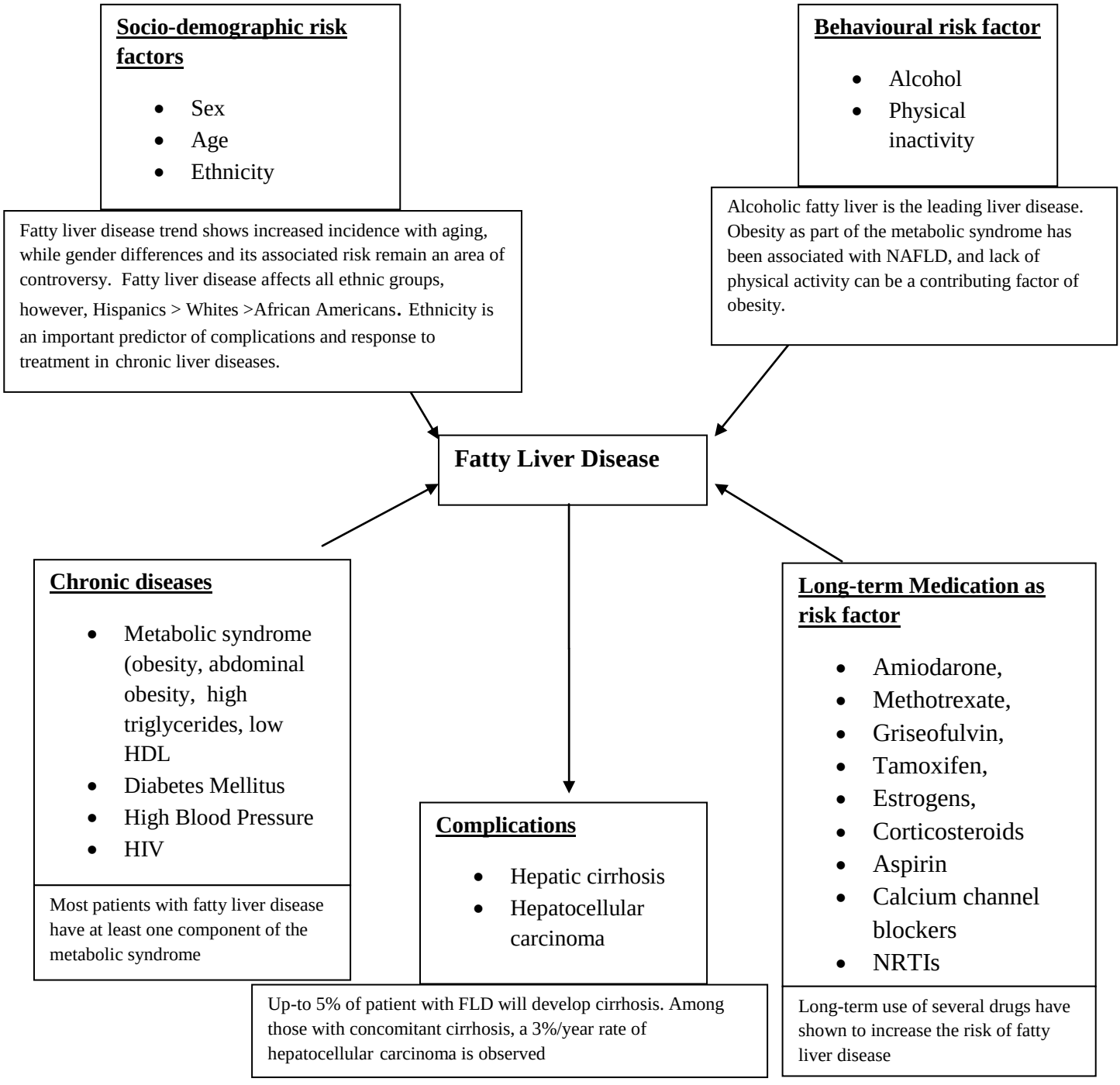


Figure 1. Conceptual framework showing interaction of risk factors and comorbidities that are associated with fatty liver disease and the possible complications that may be caused by fatty liver disease.

CHAPTER TWO

2.0 PROBLEM STATEMENT AND OBJECTIVES

2.1 Problem Statement

As the sedentary lifestyle and unhealthy diets continue to rise globally, the world is witnessing an upsurge of fatty liver disease. It is estimated that over a third of the global population is suffering from fatty liver disease, and this proportion is expected to rise (52,53). Tanzania like other resource-limited setting nations is witnessing an escalation of non-communicable diseases on top of the ever existing infectious diseases. The World Health Organisation estimated that approximately 20% of deaths in Tanzania were due to non-communicable diseases including injuries, in 2005 (54). To date, no local study has been conducted to determine the burden of fatty liver disease in Tanzania.

2.2 Rationale

This study was conducted to investigate on the prevalence of FLD in an outpatient population in Tanzanian. Data from this study hopes to shine light on the prevalence and associated factors for fatty liver disease among outpatients attending internal medicine clinics at MAMC using a non-invasive and cost-effective test (abdominal ultrasound)

2.3 Research Questions

1. What is the prevalence of fatty liver disease among outpatients attending internal medicine clinics at MAMC?
2. Are outpatients attending internal medicine clinics at MAMC aware of fatty liver disease?
3. What are the associated factors **(**sociodemographic and clinical-laboratory) for fatty liver disease among outpatients attending internal medicine clinics at MAMC?

2.4 Hypothesis

A significant proportion of outpatients attending internal medicine clinics at MAMC have fatty liver disease and are unaware of FLD causes and risk factors.

2.5 Objectives

2.5.1 Broad Objective

To determine the prevalence of fatty liver disease, associated factors and to assess awareness of fatty liver disease among outpatients attending internal medicine clinics at MAMC.

2.5.2 Specific Objectives

1. To determine the prevalence of fatty liver disease among outpatients attending internal medicine clinics at MAMC.
2. To assess awareness of patients about fatty liver disease among outpatients attending internal medicine clinics at MAMC.
3. To determine the associated factors for fatty liver disease among outpatients attending internal medicine clinics at MAMC.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study design

A cross sectional study.

3.2 Study Period

The data was collected from June 2018 up to November 2018

3.3 Study Setting

The study was conducted among outpatients attending internal medicine clinics at MAMC.

MAMC is tertiary hospital and an academic medical centre.

It is located in Dar es salaam, Tanzania and acts as one of the main referral centres for Tanzania. It runs specialist clinics with: gastroenterology, cardiology, nephrology, endocrinology, pulmonology, neurology, haematology, dermatology, and infectious (which includes CTC for HIV patients) clinics.

The Internal medicine outpatient clinics run for five days a week – Monday to Friday, whereby a minimum of fifty patients per day are seen.

3.4 Study Population

Outpatients attending internal medicine clinics at MAMC.

3.5 Inclusion criteria

Adults above 18 years of age attending any internal medicine outpatient clinic at MAMC who have signed a written informed consent form participated in the study.

3.6 Exclusion criteria

No exclusion criteria

3.7 Sample size determination

Sample size for this study was calculated using the formula for cross sectional studies:

$n = Z^2 \times p(1-p) / \varepsilon^2$

Where:

n = expected minimum sample size

Z = standard, corresponding to 95% confidence; 1.96

P = the prevalence of F.L.D50% (assume unknown prevalence)

Ɛ = maximum likely error, taken as 5%

$N = 1.96^2 \times 0.50 (1-0.50) / 0.05^2$

= 384

Taking a 10% non-response rate

$n' = \frac{n \times 100\%}{100\%-10\%}$

$n' = \frac{384 \times 100\%}{100\%-10\%}$

An actual sample size is **427** outpatients.

3.8 Sampling technique

A systematic sampling method was utilized to recruit participants. Every 3th number of patient in queue to see a doctor. The investigator obtained the list of outpatients on daily basis from a clinic nurse. The list included names and the order in which the patients would see a doctor. Every 3rd patient starting from the first one on the list on each respective recruitment day was asked to participate and enrolled after consenting.

3.9 Data collection procedure

A structured questionnaire designed by the principal investigator based on her specific objectives and literature search was used to collect data which included; socio-demographic data, that is, sex, age, marital status, level of education, and employment status, assessment of knowledge and risk factors i.e. (Diabetes, hypertension, HIV, physical activity, alcohol intake, medication history and clinical measurement of height, weight, waist circumference, skin fold thickness and mid upper arm circumference).

The interview was done by the **principal** investigator and an assistant who was trained before going to the field on how to fill the questionnaire, and take the anthropometric measurement.

3.9.1 Awareness assessment

For assessment of awareness about FLD, this study used a validated tool from the Institutional review board of the Brooklyn Hospital Centre by Ghevariya et al (18), which was pre tested here before data collection. This tool was originally in English language therefore, was translated to kiSwahili then back translated to English. It had the following questions, which gave responses for the participants to choose from:

1. Has your primary doctor ever mentioned fatty liver?
2. Which of these conditions can cause fatty liver?
3. Fatty liver is hereditary?
4. Is there a treatment available for fatty liver?
5. Fatty liver is preventable?
6. Do you think that fatty liver can occur in a non-alcoholic?
7. Do you think that fatty liver can be cured in its early stage?
8. How do you think doctors diagnose fatty liver?
9. Do you think that fat in the liver can cause a serious health problem?

3.9.2 Clinical measurements

3.9.2.1 Weight and height measurements

Weight of the participants was measured using a seca weighing scale. Calibration was done every morning before starting the work using a standard weight. Weight was taken without shoes and in light clothing. Reading was measured to the nearest 0.5 kilograms.

Height assessment was done using a height measuring wall attached meter scale without shoes and recorded to the nearest 0.5 centimetres.

BMI for each participant was then calculated by dividing weight (kilograms) with height meter squared and BMI of more than 25 kg/m^2 was taken as overweight or obesity.

3.9.2.2 Waist circumference measurements

Waist circumference was also taken using a 150cm long stretch-resistant tape measure at the end of several consecutive natural breaths, at a level parallel to the floor, midpoint between the top of the iliac crest and the lower margin of the last palpable rib in the mid auxiliary line and recorded to the nearest 0.5 centimetres.

The measurement above 94cm and 80cm in men and women respectively was considered as central obesity. This was according to the International Diabetes Federation criteria for ethnic or country-specific values for waist circumference (55).

3.9.2.3 Mid upper arm circumference and triceps skin fold thickness

Mid upper arm circumference was measured using a stretch resistant tape measure and recorded to the nearest 0.5cm

Thicknesses of skin folds (mm) measurements: triceps skin fold (TSF) was measured using a skin fold caliber and converted to centimeters.

These measurements were then used to calculate the mid arm muscle circumference using the formula:

Mid arm muscle circumference = Mid upper arm circumference (cm) – 3.14 x triceps skin fold (cm).

Whereby, <23cm in men and <18 cm in women was indicative of borderline or depleted muscle mass.

3.9.2.4 Blood pressure measurements

Blood pressure was taken from the arm (brachial artery) from all respondents in the first encounter by using digital sphygmomanometer.

Blood pressure measurement was done in a sitting position with the arm supported.

The systolic pressure of above or equal to140mmHg and diastolic pressure above or equal to 90mmHg was regarded as a high blood pressure.

3.9.2.5 Physical activities assessment

In this study, independent self-report (compendium coding) of activities that the individual does on a regular basis were identified and recorded. The respondent was asked questions about physical activity using assessment from the GLOBAL recommendations on physical activity for health (56,57).

3.9.2.6 Alcohol intake

The frequency and amount of alcoholic beverages currently/previously consumed were asked on the questionnaire. They were asked how many days they consumed alcoholic beverages in a week and how much they drank beer, cider, wine and spirits/liquor in a day, and for how long they had been taking alcohol. The number of grams of alcohol consumed per day, and the number of units of alcohol consumed in a week was calculated from the interviews. This information was recorded in standard unit (500 ml bottle of beer, 25ml glass of spirit/liquor, and 175ml glass of wine). Using information from the Alcohol guidelines 11th Report of Session 2010-12 by Stringer G et al (58), we calculated the following ethanol contents:

Beer 16g (2units)/bottle; spirits/liquor 8g (1unit)/glass; and wine16g (2units)/glass. With these estimates, we calculated the total grams of ethanol consumed in an average day, and the total units of alcohol consumed in a week.

Then > 21 units for men, and > 14 units for women per week, for a period of more than 2 years was considered significant alcohol intake.

3.9.3 Laboratory procedure

3.9.3.1 Biochemical tests

Blood was drawn from participants from the forearm by venepuncture in the hospital outpatient laboratory to perform the following blood work:

- Liver enzymes(AST, ALT), Serum Albumin
- Lipid profile (Triglycerides, HDL, Total Cholesterol) ; More than 250mg/dl of serum total cholesterol level or more than 170 mg/dl of serum triglyceride level was regarded as hypercholesterolemia or hypertriglyceridemia respectively.

Using the Biotecnicia 3500 (BT3500) machine

- Hepatitis panel (HBsAg, Anti-Hep CAb)

Using CTK biotech OnSite rapid test kits

3.9.4 Abdominal Ultrasound

Was performed by the principal investigator with an experienced sonographer, using a 4 – 5.5 MHz transducer Phillips GE (Voluson P8) ultrasound machine. The findings were stored in the hospital system and disc and were cross checked by an experienced radiologist for confirmation of results.

Normally: The echogenicity of the normal liver equals or minimally exceeds that of the kidney cortex or spleen. Intrahepatic vessels are sharply demarcated, and posterior aspects of the liver are well depicted.

In this study, fatty liver was:

Diagnosed by:

- Focal or Diffuse fatty infiltration, and graded as
    1. Slight/Mild, increase in fine echoes in liver parenchyma with normal visualization of diaphragm and intrahepatic vessel borders;
    2. Moderate, increase in fine echoes with slightly impaired visualization of intrahepatic vessels and diaphragm;
    3. Marked, increase in fine echoes with poor or nonvisualization of the intrahepatic vessel borders, diaphragm, and posterior right lobe of the liver (59,60).

3.10 Study Variables

Study variables for this study include as follows:

Independent variables include: Age, sex, metabolic syndrome (diabetes mellitus, dyslipidemia, waist circumference and hypertension), alcohol use, and BMI

Dependent variables include: Fatty Liver Disease by ultrasound scan diagnosis.

3.11 Data processing and analysis

All questionnaires were assessed by the investigator for completeness and accuracy before data entry. A predesigned database accommodating all variables in the questionnaire was created on SPSS v.20 and utilized for both data entry and analysis. The variables and values of the final data set provided in SPSS are in English.

Continuous and Categorical variables were presented as means (± SD) and frequencies (percentages) respectively. Furthermore, Student's t-test and chi-square tests was utilized to compare continuous and categorical variables respectively. To assess for associated factors for fatty liver disease (as a dependent variable), we performed logistic regression analyses. The multilevel models were fitted with baseline covariates like age, sex, metabolic syndrome (diabetes mellitus, dyslipidemia, hypertension), alcohol use, and BMI (as independent variables) associated with fatty liver disease by bivariate analysis at the <0.05 significance level. Crude and adjusted odds ratios with 95% confidence intervals and p-values were reported. All tests were 2-sided, and $p<0.05$ was used to denote statistical significance.

3.12 Ethical consideration

Ethical approval for conducting this research was sought from the research and publication committee of MUHAS. Written informed consent from participants was sought prior recruitment into the study. Potential study participants were informed of the study objectives and of their right to participate, to withdraw from the exercise whenever they wish to, or not to participate at all. Informed written consent was obtained from individuals who agreed to participate in the study. Complications that could arise during the drawing of blood for investigation from venepuncture were explained to patients, these; include haematoma formation, nerve damage, pain, haemaconcentration, extravasation, iatrogenic anaemia, arterial puncture, petechiae, allergies, fear and phobia, infection, syncope and fainting, excessive bleeding, edema and thrombus (61). Confidentiality was and is still maintained in all aspects. Privacy was observed during clinical assessment.

3.13 Disposal of Study Patients

All clinical findings and results were communicated as early as possible to the respective participants. For participants whose results showed to have fatty liver disease, they were called in to be informed of the results, then patients were advised to attend gastroenterology clinic whereby they are advised and assisted in management of the suspected risk factors as there is no definite treatment for fatty liver disease, but to eliminate the suspected risk factor, for example: those taking alcohol are advised to reduce intake and if possible eventually stop, those with high BMI are advised on weight loss. Patients are set to be reviewed at gastroenterology clinic for follow up investigations.

CHAPTER FOUR

4.0 RESULTS

4.1 Descriptive Findings

A total of 432 outpatients participated in the study, of which 199(46.1%) were male and 233(53.9%) female. The participants' mean (SD) age was 52.6±16.6 years old. Age ranged from 18-97 years old. Majority of the patients, 295 (68.3%) were in the age group ≥45 years old. Most of participants in this study lived in the urban area 379(87.7%), 330(76.4%) were married, 408(94.4%) had formal education, and 343(79.4%) were ever employed (currently employed plus retired). Among the participants 77(17.8%) had DM, 125(28.9%) had HTN, 23(5.3%) had HIV and 161(37.3%) had history of medication use within the past 12 months (NRTIs, CCB, and ASA). The mean (SD) BMI and waist circumference of the participants were 27.3±5.3 kg/m² and 95.8±14.8 cm respectively, table 1.

Comparatively, participants with FLD shared similar baseline demographic characteristics to their FLD-free counterparts except for age>45 which was significantly associated with FLD. The baseline anthropometric, lipid profile, risk factors like diabetes mellitus, hypertension and history of medication also showed a higher rate among the FLD group as compared to the No FLD group, table 1.

Table 1: Socio-demographic and clinico-laboratory correlates of Study Population.

N=432

Characteristic		All patients (n=432)	FLD 60	NO FLD 372	P- value
Demographics					
Age, mean (SD), years		52.6 (16.6)	57.9 (11.9)	51.8 (17.1)	**0.008**
Age groups					
<45 (%)		137 (31.7)	8 (13.3)	129 (34.7)	
≥45 (%)		295 (68.3)	52 (86.7)	243 (65.3)	**0.001**
Gender	Male (%)	199 (46.1)	35 (58.3)	164 (44.1)	**0.050**
	Female (%)	233 (53.9)	25 (41.7)	208 (55.9)	
Marital status: Married (%)		330 (76.4)	47 (78.3)	283 (76.1)	0.870
Residency: Urban (%)		379 (87.7)	54 (90.0)	325 (87.4)	0.675
Level of education: Formal Education (%)		408 (94.4)	58 (96.7)	350 (94.1)	0.555
Job: Ever Employed (%)		343 (79.4)	44 (73.3)	299 (80.4)	0.229
Alcohol intake: Significant (%)		130 (30.1)	21 (35.0)	109 (29.3)	0.367
Exercise: ≥days /week (%)		227 (52.5)	32 (53.3)	195 (52.4)	1.000
Anthropometrics, mean (SD)					
BMI		27.3 (5.3)	29.1 (5.5)	27.0 (5.2)	**0.019**
Waist Circumference		95.8 (14.8)	100.2 (13.7)	95.0 (14.8)	**0.013**
Mid arm muscle circumference		23.0 (3.8)	24.1 (3.8)	22.9 (3.8)	**0.040**
Laboratory investigations, mean (SD)					
AST		25.1 (23.3)	26.6 (15.7)	24.9 (24.3)	0.405
ALT		23.3 (19.0)	23.9 (12.0)	23.3 (20.0)	0.859
Serum Albumin		4.3 (0.7)	4.4 (0.6)	4.3 (0.7)	0.698
Total Cholesterol		188.8 (70.0)	256.3 (134.6)	178.0 (44.2)	**<0.001**
HDL		45.9 (13.6)	38.8 (16.1)	47.1 (12.8)	**<0.001**
Triglycerides		150.7(228.5)	272.3 (572.0)	131.1 (76.3)	**<0.001**
Co morbidities					
DM (%)		77 (17.8)	37 (61.7)	40 (10.8)	**<0.001**
HTN (%)		125 (28.9)	27 (45.0)	98 (26.3)	**0.005**
HIV (%)		23 (5.3)	4 (6.7)	19 (5.1)	0.543
Hepatitis B (%)		11 (2.5)	2 (3.3)	9 (2.4)	0.655
Hepatitis C (%)		2 (0.5)	1 (1.7)	1 (0.3)	0.259
Medication History (%)		161 (37.3)	39 (65.0)	122 (32.8)	**<0.001**

4.2 The prevalence of fatty liver disease

Out of the total sample, the prevalence of fatty liver disease among outpatients attending internal medicine clinics at MAMC was found to be 13.9% (60/432). The prevalence in male gender was 17.6% (35/199) and in females, 10.7% (25/233) figure2.

In regards to grades, 38 participants had grade 1 (63.3%), 19 presented with grade 2 (31.7%), and 3 were grade 3 (5.0%), figure 3.

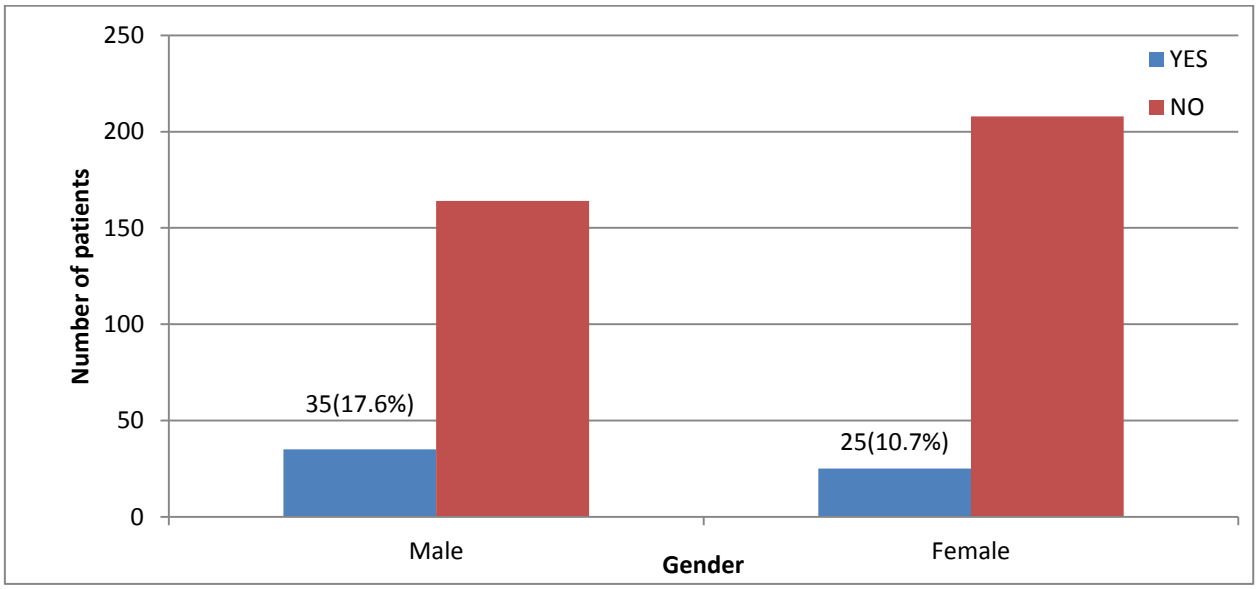


Figure 2: The distribution of gender with fatty liver disease among outpatients attending internal medicine clinics at MAMC.N=432

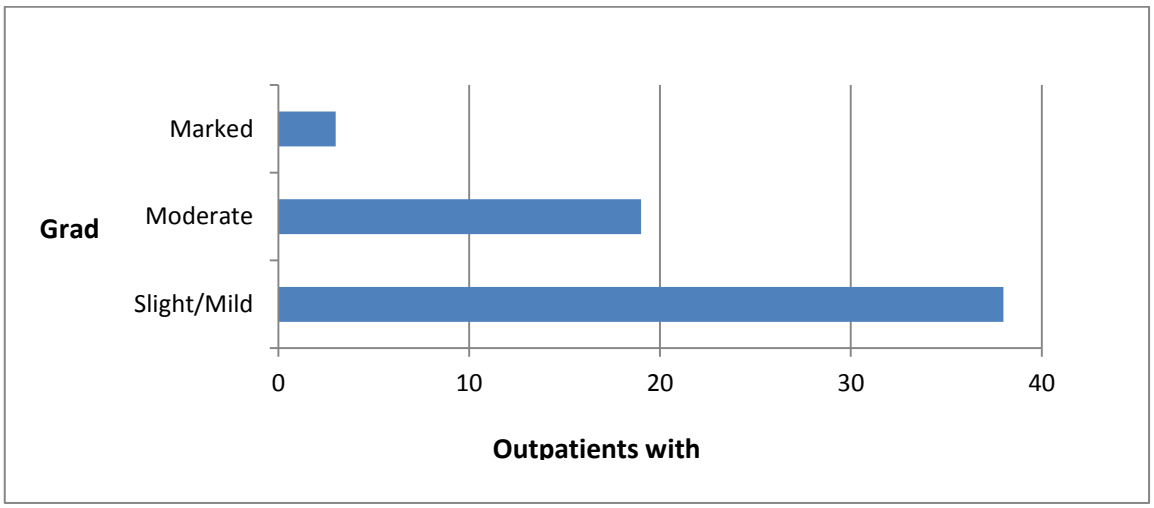


Figure 3: The grades of fatty liver disease among outpatients attending internal medicine clinics at MAMC.N=432

4.3 Assessment of awareness of patients about FLD

Overall, 91.4% of the study participants denied any prior discussion regarding FLD with their primary physicians. Participants' awareness on disease states that are associated with FLD ranged from 25% (diabetes) to 71% (excessive alcohol intake). Furthermore, 17.8% of the participants believed that FLD is hereditary and 65.7% of the participants recognized FLD as a preventable condition. Similarly, 68.8% of subjects were unaware of the reversibility of FLD in its early stage. Only 18.1% of the participants thought that FLD could occur in a non-alcoholic individual. About 52% of the study participants were not sure how this condition is diagnosed. Eighty-six percent were not sure if fat deposition in the liver could cause serious health problems, table 2.

Table 2: **Awareness of FLD among study participants (N=432)**

QUESTION	OPTION	No	%
Has your primary doctor ever mentioned fatty liver?	Yes	37	8.6
	No	395	91.4
Which of these conditions do you think can cause fatty liver?	Obesity	278	64.4
	Diabetes	108	25
	Excessive alcohol intake	308	71.3
	High cholesterol	219	50.7
	Lack of exercise	164	38
Fatty liver is hereditary	True	77	17.8
	False	355	82.2
Is there a treatment available for fatty liver?	Yes	106	24.5
	No	116	26.9
	Don't Know	210	48.6
Fatty liver is preventable	True	284	65.7
	False	148	34.3
Do you think that fatty liver can occur in a non-alcoholic?	Yes	78	18.1
	No	196	45.4
	Don't Know	158	36.6
Do you think that fatty liver can be cured in its early stage?	Yes	69	16
	No	66	15.3
	Don't Know	297	68.8
How do you think doctors diagnose fatty liver?(one or more answers)	Sonogram of liver	67	15.5
	Blood tests	114	26.4
	Body weight/Obesity	27	6.3
	Not sure	224	51.9
Do you think that fat in the liver can cause a serious health problem?	Yes	15	3.5
	No	46	10.6
	Don't Know	371	85.9

4.4 Determination of the associated factors for fatty liver disease

In a logistic regression model of 19 potential associated factors for FLD, 10 factors including Male gender, age ≥45 years, BMI>25, waist circumference >94M/80F, history of medication use, DM, high total cholesterol, high triglycerides and low HDL showed significance during bivariate analysis, table 3.

Table 3: **The associated factors of fatty liver disease among outpatients attending internal medicine clinics at MAMC.N=432**

FACTOR	COMPARISON	OR	95% CI	P VALUE
Female	Male	0.563	0.324-0.979	**0.042**
AGE <45	≥ 45	3.451	1.591-7.485	**0.002**
No significant alcohol	Significant intake	0.770	0.433-1.369	0.373
EXERCISE < 3 days/week	≥3 days/week	0.964	0.558-1.665	0.895
Non-diabetic	diabetic	0.075	0.040-0.139	**0.000**
Non-hypertensive	hypertensive	0.437	0.250-0.764	**0.004**
HIV negative	positive	0.754	0.247-2.297	0.619
Negative medication history	positive	0263	0.148-0.466	**0.000**
BMI ≤ 25 kg/m²	> 25 kg/m²	1.901	1.055-3.425	**0.033**
WAIST CIRCUMFERENCE ≤ 94M/80F cm	> 94M/80F cm	2.504	1.192-5.259	**0.015**
MID ARM MUSCLE CIRCUMFERENCE ≤23M/18F cm	>23M/18F cm	1.311	0.719-2.392	**0.377**
AST ≤40 U/L	>40 U/L	1.379	0.503-3.780	0.532
ALT ≤40 U/L	>40 U/L	0.763	0.223-2.617	0.667
ALBUMIN <3.5mg/dL	≥3.5mg/dL	2.815	0.848-9.345	0.091
HEP B S Ag Negative	positive	0.719	0.152-3.412	0.678
HEP C AB Negative	positive	0.159	0.010-2.577	0.196
T.CHOLESTEROL≤ 220	>220	8.744	4.806-15.910	**0.000**
HDL < 40	≥40	0.212	0.119-0.377	**0.000**
TRIGLYCERIDES ≤170	>170	4.931	2.789-8.718	**0.000**

However, during multivariate logistic regression analysis of the 10 factors which showed significance during bivariate analysis just 6 remained independent associated factors, table 4.

For instance males had a 2.6 increased likelihood of having FLD compared to females, (OR 2.6, 95% CI 1.2-5.5, p=0.02). Participants with diabetes mellitus displayed a 10 times risk of FLD compared to their diabetes free counterparts, (OR 10, 95% CI 5.0-21.3, p<0.001). Abdominal obesity was associated with a 3 fold increase in FLD, (OR 3.0, 95% CI 1.1-7.6, p=0.03). Participants with elevated cholesterol had about 5 times increased chance of FLD compared to ones with normal cholesterol levels, (OR 4.9, 95% CI 2.2-10.7, p<0.001). Low HDL and high triglycerides were associated with 4 fold and a 2 fold increased likelihood of FLD respectively, (OR 4.3, 95% CI 2.1-8.9, p<0.001; OR 2.2, 95% CI 1.0-4.7, p=0.04), table 4.

Overall, during this analysis diabetes mellitus was found to be the strongest associated factor for FLD.

Table 4: **Multivariate logistic regression**

VARIABLES	**ODDS RATIO**	**CI of 95%**	**P-VALUE**
Male gender	2.569	(1.202 5.493)	**0.015**
DM	10.278	(4.958 21.303)	**0.000**
Waist >94M,80F	2.945	(1.147 7.567)	**0.025**
T. Cholesterol >220	4.870	(2.210 10.733)	**0.000**
HDL <40	4.326	(2.108 8.879)	**0.000**
Triglycerides >170	2.196	(1.034 4.666)	**0.041**
Medication History	0.960	(0.334 2.761)	0.940
HTN	1.083	(0.499 2.352)	0.840
Age ≥ 45	0.710	(0.282 1.787)	0.467
BMI >25.5	0.554	(0.237 1.297)	0.174

CHAPTER FIVE

5.0 DISCUSSION, STRENGTHS AND LIMITATIONS

5.1 Discussion

To our knowledge, this study represents the first study on the prevalence of fatty liver disease in Tanzania. Fatty liver is a clinicopathologic syndrome that manifests from hepatic steatosis and excessive fat accumulation caused by a variety of factors. While liver biopsy is the gold standard for diagnosis of fatty liver, ultrasonography is generally used as a non-invasive screening method for the general population.

In this present study 13.9% of adults attending internal medicine clinics at the MUHAS Academic Medical Centre had fatty liver disease. Several studies have revealed variable rates of fatty liver disease. These variations are highly attributed to differences in characteristics of populations studied, their specifics and methods of assessing FLD. For instance, a Nigerian study by Asabamaka et al which involved 150 outpatients attending endocrine clinic revealed a prevalence of 8.7%, slightly lower than our present findings (36). In unison to our findings, a Chinese study which had over 9000 participants found prevalence of 12.5% of fatty liver disease in the general population (35). On the contrary, majority of studies have produced relatively higher rates of fatty liver disease in various populations. For example, study by Olusanya et al revealed a fatty liver prevalence of 16.7% in a diabetes sub population (2). Similarly, a study in Malaysian general population found a prevalence of 22.7% (28). Moreover, an Italian study by Bellentani et al involving nearly 7000 people from the general population published a fatty liver rate of 58.3% (62).

The aim of our study was to explore the awareness about FLD from patients attending a tertiary hospital in Tanzania. Overwhelming majority of the participants 395 (91.4%), admitted that their primary physicians had never mentioned FLD to them, and therefore most of them did not know whether FLD was a potentially dangerous condition. These findings are similar to several other previous studies which have showed poor awareness of FLD. For example, in a study by Wieland et al, just 18% of the 302 endocrine clinic patients reported awareness of FLD (16). While in a study by Leung et al, 83% of the 521 responders to a telephone survey were perceived to have no knowledge of FLD (63). Furthermore, in an American study by Ghevariya et al, of 5000 participants from the

general population, 98% stated that their primary physicians did not have a discussion regarding FLD (18).

Despite of these depressing results on the awareness about FLD, there are studies that have shown a good awareness of the disease. For instance, a study by Goh et al assessing the attitudes towards FLD among attendees at a gastroenterology public forum with 227 subjects, 126 (71.2%) reported to have heard about FLD (17). Lack of awareness may result in affected individuals remaining undiagnosed and presenting only in the later stages of symptomatic advanced disease. Our study findings call for strategies to improve awareness of FLD through education of risk recognition especially in populations at risk. Moreover, even though unaware, the majority of subjects were open to FLD screening.

Several factors ranging from genetics to lifestyle have been attributed to FLD. In our study, male gender, overweight, increased waist circumference, diabetes mellitus, high total cholesterol, low HDL and high triglycerides were found to be independent associated factors for fatty liver disease. This observation was echoed by several studies within the literature. For instance, in an Asian community based study by Goh et al there was a preponderance of FLD in males, subjects with FLD were older, had higher BMIs and larger waist circumferences (17). Another study by Browning et al from a multiethnic population based sample showed men to have FLD more than women, obesity and insulin resistance were also associated risk factors (64). Several other Asian studies showed similar findings in associated factors of FLD, like a study by Fu et al obesity, increased waist circumference and high triglycerides were associated with FLD in adolescents (33). Likewise, a study by Liao et al had the male gender, high triglycerides, high cholesterol, hyperglycemia, with an addition of old age, hypertension and hyperuricemia as associated risk factors for FLD (65). In addition, a study by Li et al revealed male gender, obesity, diabetes mellitus, high triglycerides, high cholesterol, low HDL, increased age, hypertension, high LDL and ALT abnormalities to have a strong association with FLD (35). A population based study done in Iran by Amirkalali et al interestingly had the female gender as associated factor for FLD, other factors were high waist circumference, overweight, old age, diabetes mellitus, dyslipidemia and abnormal liver enzymes (66).

5.2 Study Strengths and Limitations

Findings from this study have revealed data of FLD in Tanzania and its potential importance in public health. Our data has also provided a glimpse of how poor the knowledge of FLD is, in a population whose burden was not known, which raises concern about intervention to improve this. Another strength being that several associated factors of FLD have been revealed in this study, which opens room for the policy makers and clinicians in preventive medicine to tackle on these problems before they become unbearable.

The limitation of the study could be a possibility of performance and observer bias of ultrasound as all patients were screen and diagnosed via ultrasound, although we did try our best to mitigate this by having our ultrasound images being confirmed by a senior radiologist.

CHAPTER SIX

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

Fatty Liver Disease is not uncommon in an outpatient population of Tanzania. Our findings also have shown that there is a significantly poor awareness among the outpatient population regarding FLD in its totality. Factors that were associated with FLD in this current setting were similar to the ones reported in several other settings around the globe.

6.2 Recommendations

In view of this several strategies to raise community awareness and improve health education are vital especially in this era where NCDs are blooming. To aid in prevention of FLD, provision of education to the community by means of thorough counseling by primary care health providers can be of vital importance. For early detection and timely management implementation of screening for high-risk individuals should be adopted by policy makers.

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8.0 APPENDICES

8.1 Consent form (English version)

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES

CONSENT FORM

My name is Dr. Nontobeko N. Simelane; I am pursuing a master's degree in Internal Medicine at the Muhimbili University of Health and Allied Sciences (MUHAS). I am carrying out a study on prevalence of fatty liver disease and associated factors among outpatients attending internal medicine clinics at Muhas academic Medical centre.

You have been selected by chance to participate in this study. Your participation is completely voluntary and you may withdraw consent at any time in the course of the interview. I would like to assure you that all your information will be kept confidential; serial numbers instead of your name will be used in this study for identification.

I will assess you by conducting an interview, measuring your blood pressure, BMI, skin fold thickness, abdominal ultrasound and eventual take blood samples for lipid profile, liver enzymes and hepatitis panel. After reading the explanation, don't hesitate to ask any questions in case you need clarification.

If you have any questions related to this study, or your health you can call me on my telephone numbers +255(0)787 926 884 the undersigned do hereby volunteer to participate in this study. The nature and purpose have been fully explained to me.

I understand that all information obtained will be used for this study only.

SIGNATURE _____ DATE _____

WITNESS _____ DATE_____

8.2 Consent form (Swahili version)

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES

FOMU YA RIDHAA KUSHIRIKI KWENYE UTAFITI

Jina langu ni Dr. Nontobeko N. Simelane

Ninatokea chuo kikuu cha tiba na afya Muhimbili katika idara ya tiba. Ninafanya utafiti kuhusu kiwango cha mafuta katika ini na viashiria vyake kwa wagonjwa wanaokuja kupata huduma katika hospital ya Mloganzila (MAMC) Dar es salaam, ikiwa huu ni utafiti wasayansi ya tiba unapaswa kufahamu yafuatayo kabla ya kushiriki; kwako ni kwa hiari na kwakupenda kwako.

Unaweza kukataa kushiriki au kusitisha mahojiano au majadiliano wakati wowote,utafiti huu utahusisha kupima shinikizo la damu,uwiano wa uzito na urefu wako,kuchukuliwa vipimo vya ultrasound na pia kutolewa damu kwa ajili ya kujua utendaji kazi wa ini,kiwango cha mafuta mwilini na virusi vya ini.

Taarifa zako utakazozitoa hazitawekwa hadharani kwa namna yeyote ile kwa hiyo ushiriki wako hautafahamika. Jina lako au taarifa zozote zinazokutambulisha hazita ambatanishwa na taarifa zako utakazozitoa

Usisite kuuliza swali lolote pale unapoona kuna sababu.

Kama una maswali zaidi ambayo ungependa kuuliza kuhusianana utafiti huu, tafadhali:

Wasiliana na mtafiti mkuu +255(0)787 926 884 idara ya magonjwa ya tiba Chuo Kikuu cha afya Muhimbili S.L.P. 65001 Dar es salaam, Tanzania.

Nimesoma au nimeambiwa kuhusu yaliyomo humu ndani. Maswali yangu yamejibiwa.

Nakubali kushiriki katika utafiti huu.

SAHIHI _____ TAREHE _____

SHAHIDI_____ TAREHE_____

8.3 Questionnaire (English Version)

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES

QUESTIONNAIRE ON PREVALENCE OF FATTY LIVER DISEASE ANDASSOCIATED FACTORS AMONG INTERNAL MEDICINE OUTPATIENTS AT MUHAS ACADEMIC MEDICAL CENTRE

SECTION A

I. GENERAL INFORMATION

Date of Interview: ...../...../ 2018

Name of Interviewer: .....

Serial Number: .....

Hospital File No. .....

II. DEMOGRAPHIC CHARACTERISTICS OF RESPONDENT

10. Number of interviewee.....

11. Age …….

12. Gender of respondent
    a) Male
    b) Female

13. Where do you reside? …….
    a) Urban
    b) Rural

14. What is your marital status?
    a) Married
    b) Never married
    c) Divorced/separated
    d) Widow
    e) Cohabiting

15. What is your highest level of education?
    a) No formal education
    b) Primary school
    c) Secondary school
    d) College/University

16. What is your employment status?
    a) Employed
    b) Unemployed
    c) Self – employed
    d) Retired

III. BEHAVIORAL ACTIVITIES

17. Do you currently take /previously taken alcohol? (If yes, answer following questions)
    a) No
    b) Yes

18. How often do you drink alcohol?
    a) Daily
    b) Weekly
    c) Monthly
    d) Occasionally

19. For how long have you been having/had alcoholic drinks?
    a) Less than 2years
    b) More than 2years

20. Which alcoholic drink do you prefer to drink?, how many?
    a) Beer ……
    b) Cider ……..
    c) Spirits …….
    d) Wine ……..
    e) Local brew ……..

21. On average, how many days per week do you engage in moderate to strenuous exercise (like a brisk walk)?

    _____ days

22. On average, how many minutes do you engage in exercise at this level?

    _____ minutes

IV. CHRONIC DISEASES AND LONG-TERM MEDICATION

23. Have you been diagnosed (currently/previously) with any disease? (put more than one response where applicable)
    a. No
    b. Yes
        i. Diabetes mellitus
        ii. Hypertension
        iii. HIV/AIDS
        iv. Obesity
        v. Dyslipidemia
        vi. Other ……
24. In relation to drug use, have you in the past twelve months used any of these drugs? (put more than one response where applicable)
    a) No
    b) Yes
        i. Amiodarone
        ii. Methotrexate
        iii. Griseofulvin
        iv. Tamoxifen
        v. Estrogens
        vi. Corticosteroids
        vii. Aspirin
        viii. Calcium channel blockers
        ix. NRTIs
        x. Other ……

V. ASSESSMENT OF AWARENESS ABOUT FLD

25. Has your doctor ever mentioned fatty liver? a)Yes b)No

26. Which of these conditions can cause fatty liver?

a) Obesity b) Excessive alcohol intake

c) Diabetes d) High cholesterol e) Lack of exercise

27. Fatty liver is hereditary? a) True b) False

28. Is there a treatment available for fatty liver? a) Yes b) No c) Don't know

29. Fatty liver is preventable? a) True b) False

30. Do you think that fatty liver can occur in a non-alcoholic? a)Yes b)No c)Don't know

31. Do you think that fatty liver can be cured in its early stage? a)Yes b)No c)Don't know

32. How do you think doctors diagnose fatty liver?(one or more answers)

a) Sonogram of liver b) Blood tests

c) Body weight/obesity d) Not sure

33. Do you think that fat in the liver can cause a serious health problem

SECTION B

I. CLINICAL ASSESSMENT

34. Weight …….
35. Height ……. BMI……
36. Waist circumference ……..
37. Mid upper arm circumference …….
38. Skin fold thickness ……
39. Blood pressure …….

II. BLOOD WORK-UP RESULTS

40. Liver enzymes: AST …… ALT ……
41. Serum albumin …….
42. HBsAg……., Anti-HepCAb……...
43. Lipid profile: Triglycerides ……., HDL……., T. Cholesterol ……..

III. ABDOMINAL ULTRASOUND FINDINGS

44. Fatty Liver changes (hepatic steatosis)
    a) No
    b) Yes

45. If yes, what grade?
    a) Slight (grade I)
    b) Moderate (grade II)
    c) Marked (grade III)
    d) Steato hepatitis (with inflammation)
    e) Cirrhosis

46. Other findings …….

8.4 Questionnaire (Swahili Version)

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES

I

Tarehe ya mahojiano:_____/_____/2018

Jina la msahili: .....

Serial Number: .....

Namba ya kadi ya hospitali…….

II: MAELEZO BINAFSI

1. Namba ya mshiriki anaye hojiwa: .....
2. Umri wake (Miaka): .....
3. Jinsia ya mshiriki
    a) Mume
    b) Mke

4. Unaishi wapi ?.....
    (a) Mjini
    (b) Kijijini

5. Nini hali yako ya ndoa
    a) Nimeoa / Nimeolewa
    b) Sijawahi olewa
    c) Tumeachana / Tumetengana
    d) Mjane
    e) Tunaishi bila ndoa

6. Je una kiwango gani cha elimu?
    a) Sijasoma
    b) Elimu ya msingi
    c) Elimu ya sekondari
    d) Elimu ya chuo/chuo kikuu

7. Ningependa unieleze hali ya ajira yako

a) Nimeajiriwa

b) Sina ajira

c) Nimejiajiri mwenyewe

d) Nimestaafu

III: MASWALI KUHUSU TABIA

8. Je, unatumia/umeshawahi tumia Pombe (kama Ndiyo Jibu maswali yafuatayo 9-11)

a) Ndiyo

b) Hapana

9. Unatumia mara ngapi Pombe?

a) Kila Siku

b) Kila Wiki

c) Kila Mwezi

d) Mara Chache

10) Kwa muda gani umekuwa unatumia Pombe?

a) Chini ya miaka miwili

b) Zaidi ya miaka miwili

11)Unatumia Pombe ya aina gani? Unatumia kiasi gani?

a) Bia……

b) *Siki*……..

c) *Konyagi*……

d) *Wine***……**

e) Pombe za Kienyeji……..

12) Kwa wastani ni mara ugapi kwa wikiunajishuhulisha na kazi/mazoezi ya wastani au mazito …….. siku?

13) Kwa dakika ngapi …….

IV: MAGONJWA SUGU NA MATUMIZI YA MADAWA KWA MUDA MREFU

14. Je? una ugonjwa wowote sugu kati ya haya(Jibu kama ni zaidi ya moja)

a) Hapana
b) Ndiyo
i) Kisukari
ii) Shinikizo la Damu
iii) Virusi vya Ukimwi/Ukimwi
iv) Uzito Kupitiliza
v) Mafuta Mengi Mwilini(REHEMU)
vi) Mengineyo……..

15. Je kuna Dawa ambayo umetumia ndani ya mwaka huu?

NRTI (dawa za HIV)

V: UFAHAMU KUHUSU UGONJWA WA MAFUTA KWENYE INI

16. Je daktari wako amewahi kuzungumza na wewe kuhusu ugonjwa wa mafuta kwenye ini? a) Ndiyo b) Hapana

17. Magonjwa yapi kati ya haya yanaweza kuleta ugonjwa wa mafuta kwenye ini?

a) Uzito mkubwa b) Kisukari c) unywaji wa pombe kupindukia
d) mafuta mengi kwenye damu e) kutofanya mazoezi

18. Ugonjwa wa mafuta kwenye ini ni wa kurithi? a) kweli b) sikweli

19. Je kuna tiba ya ugonjwa wa mafuta kwenye ini? a) Ndiyo b) Hapana c) Sijui

20. Ugonjwa wa mafuta kwenye ini unaweza kuzuilika a) kweli b) sikweli

21. Je unadhani ugonjwa wa imafuta kwenye ini unaweza kumpata mtu asiyetumia pombe?

a) Ndiyo b) Hapana c) Sijui

22. Je unadhani ugonjwa wa mafuta kwenye ini unaweza kutibika katika hatua za awali?

a) Ndiyo b) Hapana c) Sijui

23. Je unadhani ugonjwa wa mafuta kwenye ini unagunduliwa kwa njia zipi?

a) Ultrasound ya Ini b) vipimo vya damu
c) uzito e) sina hakika

24. Je unadhani ugonjwa wa mafuta kwenye ini unaweza kuwa na madhara makubwa ya kiafya? a) Ndiyo b) Hapana c) Sijui