
# ADDIS ABABA UNIVERSITY COLLEGE OF HEALTH SCIENCES, SCHOOL OF NURSING AND MIDWIFERY, DEPARTMENT OF NURSING, ADULT HEALTH NURSING POSTGRADUATE PROGRAM

# THE MAGNITUDE AND FACTORS ASSOCIATED WITH CHRONIC LIVER DISEASE IN SELECTED PUBLIC HEALTH HOSPITALS, WEST ARSI ZONE, OROMIA, ETHIOPIA 2022.

**BY: BERESA LEMA (BSc)**

**A THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES OF ADDIS ABABA UNIVERSITY COLLEGE OF HEALTH SCIENCE SCHOOL OF NURSING AND MIDWIFERY IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS SCIENCE IN ADULT HEALTH NURSING**

**JUNE, 5, 2023 G.C**

**ADDIS ABABA, ETHIOPIA**

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## APPROVAL SHEET

## ADDS ABABA UNIVERSITY

## COLLEGE HEALTH SCIENCE SCHOOL OF NURSING AND MIDWIFERY DEPARTMENT OF NURSING, MASTER OF SCIENCE SCIENCES IN ADULT HEALTH NURSING

I, the undersigned MSc student, declare that I have submitted my original work on a title the magnitude and factor associated with chronic liver disease in selected public health hospitals, West Arsi zone, Oromia, Ethiopia 2022 for the examination.

**Submitted by:**

**Beresa Lema (BSc)** _____ _____

Name of student Signature Date

This thesis work has been submitted for examination with my approval as an advisor.

Approved by:

1. **Debela Gela (RN, MSc N)** _____ _____
   Name of Major Advisor Signature Date

2. **Teshome Habte (RN, MSc N)** _____ _____
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## APPROVAL BY THE BOARD OF EXAMINATION

**This thesis by Beresa Lema is accepted in its present form by the board of examiners as satisfying thesis requirement for the degree of masters in Master of Science Sciences in Adult Health Nursing.**

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## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| anti-HCV | HCV-antibody |
| BMI | Body Mass Index |
| CI | Confidence Interval |
| CLD | Chronic Liver Disease |
| DALYs | Disability-adjusted life years |
| GBD | Global Burden of Disease |
| ETB | Ethiopian Birr |
| HBV | Hepatitis B virus |
| HBsAg | Hepatitis B surface antigen |
| HCV | Hepatitis C virus |
| HIV | Human Immunodeficiency Virus |
| H.P.S. | Hepatopulmonary syndrome |
| ml | milliliter |
| NAFLD | Non-Alcoholic Fatty Liver Disease |
| NASH | Non-Alcoholic Steatohepatitis |
| PWYLL | Potential Working Years of Life Lost |

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# ABSTRACT

**Background:** Chronic liver disease (CLD) is a severe public health issue that affects 1.5 billion people globally. It was Ethiopia's seventh leading cause of death in 2019 with 24 fatalities per 100,000 people.

**Objective**: The aim of this study was to determine the magnitude and factors associated with medically confirmed chronic liver diseases among adult population at selected public health hospitals in West Arsi zone, 2022.

**Methods:** An institution-based descriptive cross-sectional study design with the combination of structured interview was employed from February 20, 2022 – July 6, 2022 G.C. There were 384 respondents selected using systematic random sampling method. Multivariate logistic regression analysis was used to determine the factors associated with CLD.

**Results:** A total of 384 adult individuals participated, with a response rate of 100%. The magnitude of medically confirmed chronic liver disease among adults in west Arsi zone 60.2% which is higher in male (37.26%). Having family history of chronic liver disease (AOR=5.23; 95%CI: 2.59-12.13), drinking alcohol > 20 ml per day (AOR=13.53; 95 % CI: 5.50 - 33.29), smoking cigarettes (AOR = 4.15; 95 % CI: 1.70 - 10.14), chewing khat (AOR = 2.33; 95 % CI: 1.13 - 4.77), consuming high-fat diet (AOR = 3.97; 95 % CI: 1.67 - 9.42), being infected with viral hepatitis B and C virus (AOR = 18.15; 95 % CI: 7.47 - 44.09), having comorbidity (AOR = 3.58; 95 % CI: 1.65 - 7.77), using herbal medication (AOR = 9.84; 95 % CI: 4.58 - 21.13), and being overweight (AOR = 2.68; 95 % CI: 1.05 - 6.8160.) remained statistically significant.

**Conclusion:** The magnitude of medically confirmed chronic liver diseases is 60.2% in west Arsi zone which needs much more attention of ministry of health and local authorities for prevention and interventions focused on behavioral changes, life style modifications, strengthening viral hepatitis screening activities, to tackle these modifiable associated factors with consideration regarding family history of chronic liver diseases.



**Keywords:** Chronic Liver Disease, Factors Associated, West Arsi, Ethiopia

# 1. INTRODUCTION

## 1.1. BACKGROUND

Chronic liver disease is a persistent decrease in the physiological activities of the liver that lasts for six months or more. Cirrhosis is a condition characterized by the loss of liver parenchyma and irregular regeneration of the same tissue [1]. Cirrhosis exerts deleterious effects on the musculoskeletal system, inducing sarcopenia and a decline of peripheral muscle mass along with diminished exercise tolerance, functional capacity, and quality of life [2,3]. The medical condition known as cirrhosis is categorized into two types: compensated and decompensated cirrhosis, which encompasses variceal bleeding, hepatic encephalopathy, ascites, spontaneous bacterial peritonitis, and/or hepatorenal syndrome [4]. Compensated cirrhosis is correlated with decreased rates of mortality and morbidity in comparison with decompensated cirrhosis. Decompensated cirrhosis is observed to be comparatively more frequent in the case of cirrhosis prompted by alcoholism compared to cirrhosis stimulated by hepatitis B or C, as supported by literature sources [4]. As the condition deteriorates, hospitalization becomes increasingly frequent and prolonged. Ultimately, individuals succumb to mortality or undergo liver transplantation, a financially burdensome solution for patients, healthcare infrastructure, and fiscal affairs related to healthcare and governmental entities [5]. Liver cirrhosis, despite its reputation as an incurable affliction in advanced stages, has been shown to be reversible through the appropriate treatment of its underlying cause [6]. Nonetheless, the data concerning chronic liver disease and it correlates with patients attending public health hospitals are restricted. The comprehension of the magnitude and determinants linked to chronic liver disease in designated public healthcare facilities in West Arsi district is crucial in devising preventive measures and enhancing management protocols. This study seeks to ascertain the magnitude and factors that are linked with medically confirmed chronic liver disease (CLD) among adults in selected public hospitals located within the West Arsi zone.

## 1.2. STATEMENT OF THE PROBLEM

Chronic liver disease constitutes a significant contributor to both mortality and morbidity globally. In 2016, it was documented that the 11th most prevalent cause of mortality and the 15th primary source of morbidity on a global scale accounted for 2.2 % of fatalities and 1.5% of disability-adjusted life years (DALYs) [7]. The etiologies of chronic liver disease exhibit variations across different countries. Many factors, including alcohol usage, the occurrence of comorbidities, the association between non-alcoholic fatty liver disease (NAFLD) and metabolic syndrome, access to hepatitis B virus (HBV) immunization, and initiatives aimed at averting drug use, collectively exert significant influence on both the incidence and progression of the chronic liver disorder [8, 9]. The global burden of chronic liver diseases showed that markedly increased the prevalence of cirrhosis arising from non-alcoholic fatty liver disease over the period spanning from 2012 to 2017 [10]. Conversely, the World Health Organization report indicated that worldwide endeavors directed toward the elimination of hepatitis B and C experienced a decrease in momentum. The Sub-Saharan African region exhibits a noteworthy frequency of chronic liver disease, attributable to diverse factors such as economic insufficiency, skepticism toward Western medicine, veneration of traditional medicine, and paucity in accessing appropriate healthcare facilities. More than 50% of patients in the region are admitted to hospitals with the ailment in its terminal phase, accompanied by a consequentially elevated mortality rate [11, 12]. The etiology of chronic liver disease in Sub-Saharan Africa is still obscure in 31 % of cases, while the major causative agents implicated in cirrhosis include hepatitis B virus (HBV), hepatitis C virus (HCV), and alcohol abuse, as evidenced by prevailing evidence [13]. According to statistical data, Ethiopia situated in East Africa, has a population of roughly 100 million individuals and is classified as a low-income nation. [12] In Ethiopia, chronic liver disease ranks as the seventh leading cause of mortality, with a prevalence of 24 deaths per 100,000 individuals. Current research indicates that the occurrence of chronic liver disease (CLD) is notable in various regions throughout Ethiopia. Despite existing knowledge concerning the magnitude of CLD in Ethiopia, its associated factors have not been exhaustively explored. Various investigations of chronic liver disease (CLD) have generated certain contentious postulation that necessitate further research, including but not limited to advanced age, gender, domicile, educational

attainment, alcohol consumption, khat use, and the presence of concurrent ailments. This study assumes critical significance insofar as it yields information pertinent to the effective management of hepatic ailments. To date, no scholarly inquiry has been conducted in the realm of inquiry that bears any resemblance to the subject matter under consideration. This study investigated the magnitude and factors associated with medically confirmed chronic liver disease (CLD) among adults on follow-up evaluation in public hospitals located in the West Arsi Zone.

### 1.3 SIGNIFICANCE OF THE STUDY

The prevalence of chronic liver disease is a notable contributor to mortality and morbidity in developing nations. Notwithstanding the use of distinct study designs across varying studies, the outcomes revealed that the determinants linked to chronic liver disease exhibited heterogeneity across geographic locations. Although the identification of factors associated with the condition can significantly improve the healthcare delivery system and facilitate the development of effective strategies for disease prevention, management, treatment, delay of complications and the study affords patients valuable knowledge regarding the factors underlying chronic liver disease. This not only enables individuals to fill knowledge gaps and avoid disease burdens but also contributes to the overall reduction of morbidity associated with this condition. The scholarly community stands to benefit from the investigation as it can provide novel insights and expand the body of knowledge on the subject matter. The investigation also generates relevant data, which proves beneficial for the scholars. Initiating, planning, and implementing intervention programs can prove to be highly advantageous for the local district health offices, regional and national ministries of health, health policymakers, health facility personnel, and non-governmental organizations (NGOs).

# 2. LITERATURE REVIEW

## 2.1. OVERVIEW OF CHRONIC LIVER DISEASE

The chronicity of liver disease presents a noteworthy public health concern. According to statistical data from 2017, staggering 1.32 million individuals succumbed to perpetual liver disorders. The mortality rate was higher among males, accounting for two-thirds of the overall statistics compared with females, who comprised one-third of the aforementioned demographic [14]. In accordance with assertions made by the World Health Organization, the incidence of cirrhosis resulting from hepatitis B and C has witnessed a reduction because of worldwide endeavors aimed at preventive measures [15]. Notably, the etiology of chronic liver disease exhibits divergence across different countries, and dominance ratios appear to be contingent on extrinsic variables like alcohol consumption, comorbidities, accessibility to HBV immunization, and measures implemented to avert drug usage [8]. In spite of the challenges posed by underdiagnosis and underreporting, a study investigating the worldwide prevalence of non-alcoholic fatty liver disease (NAFLD) and non-alcoholic steatohepatitis (NASH) has corroborated that the incidence of these disorders in Africa can reasonably be estimated at 13 % [16, 17, 18]. Studies showed that there is a high burden of cirrhosis in sub-Saharan Africa, where more than 50% of patients are admitted to hospitals with end-stage liver disease (12). The occurrence of fatalities associated with cirrhosis witnessed an upsurge within Sub-Saharan Africa during the time line extending from 1980 until 2010. Analyzing the underlying causes related to cirrhosis for the reported mortality cases, they remained unspecified in a notable 31 % of instances [13]. On the basis of an observational study employing a rigorous questionnaire and meta-analytical techniques, it has been ascertained that CLD constitutes the seventh canonical cognitive paradigm of adversity that humans encounter throughout their lives. It is noteworthy that the aforementioned study documented 24 fatalities per hundred thousand individuals in 2019 attributable to this cognitive framework [14]. Numerous factors are implicated in the development of chronic liver disease. Three essential components can be distinguished: sociodemographic factors, behavioral-related elements, and clinical-related aspects.

## 2.2. SOCIO-DEMOGRAPHIC FACTORS

### 2.2.1. Age

Recent research on liver disorders and aging has demonstrated that individuals in the age range of 50–65 years are at the highest risk for developing chronic liver disease (CLD) [19]. Additionally, investigations examining the emergence of myofibroblasts in liver fibrosis have indicated that the likelihood of fibrosis progression is significantly elevated with advancing age [19, 20].

### 2.2.2. Gender

The latest population-based investigation in Europe has verified that the prevalence of chronic liver diseases (CLD) is significantly higher in adult males than in females [21]. This investigation comprises an examination of the plausible salutary utility of estrogen concerning disparities in sexual orientation in relation to nonalcoholic fatty liver disease, commonly known as nonalcoholic steatohepatitis. The investigation postulates the safeguarding influence of female sex hormones in curbing the onset of hepatic fibrosis [22]. In Veracruz, a multicentric, retrospective, and relational study was conducted among a cohort of patients with liver cirrhosis. The findings of this study indicate that persistent alcohol consumption was the predominant etiological factor associated with the development of liver cirrhosis in males (97.7 %), while women demonstrated a greater prevalence of all other contributing factors [23]. A study carried out in Mexico has revealed that liver cirrhosis is a condition prevalent among males, attributable mainly to alcoholism, while females are primarily affected by viral infections or nonalcoholic fatty liver disease [24].

### 2.2.3. Socioeconomic and education

The study addressing nonalcoholic steatohepatitis (NASH) incorporated diverse socioeconomic contexts and cultural orientations across the globe as influential factors impacting the prevalence of this chronic liver ailment [24, 25]. Analogously**,** a case-control investigation under taken in central India ascertained that insufficient education and unfavorable socioeconomic conditions exhibited considerable risk effects for chronic liver maladies [26].

### 2.2.4. Topography

A study conducted in the United States demonstrated that there were variations in chronic liver disease (CLD) mortality rates across diverse ethnicities [27]. According to data collected between 2012 and 2017, the mortality rates resulting from cirrhosis per 100 000 individuals were significantly lower (12.9 %) in Southern Africa than in other regions, such as Central Africa, Eastern Africa, and Western Sub-Saharan Africa, which accounted for 24.2 %, 23.1 %, and 23.5 %, respectively (10).

### 2.2.5. Marital status

The findings of research conducted in Mexico indicate that enduring alcohol consumption is positively correlated with chronic liver disease in individuals with primary and secondary education. Additionally, the study revealed that the group with persistent alcohol intake exhibited a higher prevalence of singleness (77.0 percent), as did the viral disease group (73.1 percent), while the unmarried partner group only marginally prevailed in non-alcoholic fatty liver disease (37.5 percent) [27].

## 2.3. BEHAVIORAL RELATED FACTORS

According to the study conducted on the global prevalence of alcohol consumption and its harmful effects on liver health within the European Union revealed that the predominant etiological factor for chronic liver disease in developed nations is frequent alcohol consumption. Furthermore, findings showed that 41 % of hepatic-related mortality is attributable to alcohol-induced disease. A notable observation from the study was that Romania recorded the highest fatality rate due to hepatic disease in Europe, with a significant proportion resulting from alcohol consumption. These results are documented in sources [13] and [16]. The findings of a study undertaken in various nations, including China, reveal that tobacco consumption is categorically recognized as a self-sustaining hazard factor for liver fibrosis in non-alcoholic fatty liver disease (NAFLD) [3, 28].

A case–control study executed in the central region of India revealed that the consumption of alcohol and cigarettes were notable elements that increased the possibility of chronic liver disease (CLD) [26]. The findings of a population-based cohort investigation examining the association between smoking behavior and the risk of liver cirrhosis revealed that smoking is strongly associated with heightened susceptibility to chronic liver disease. Notably, the study reported a greater proclivity for females who smoke exceeding

10 g of tobacco daily to be subject to the aforementioned risks by a factor of 9.4 compared to their non-smoking counterparts. Meanwhile, males who smoke this comparable amount is exposed to a risk 1.6 times greater than that of those who have never smoked [29]. The consumption of alcohol has been identified as a substantial causal factor in the emergence of persistent hepatic pathologies in several countries, including the Central African Republic, Gabon, Malawi, Uganda, and Cote d'Ivoire. These nations exhibited the highest mortality rates for cirrhosis globally, ranking within the top decile in 2010 [30]. A study investigating the link between smoking and liver fibrosis in nonalcoholic fatty liver disease patients revealed the significance of exercise in enhancing practical capacity, elevating the quality of life, reducing fatigue levels, and minimizing the hepatic venous portal gradient while avoiding unfavorable outcomes.

### 2.4. CLINICALLY RELATED FACTORS

Hepatitis B virus (HBV) and hepatitis C virus (HCV) have been identified as the prevailing etiologies of chronic liver disease (CLD) in a global context [16]. Reports show that chronic HBV approximately affects 257 million individuals worldwide. The absence of useful therapeutic measures poses a consequential threat, with almost 20 % of the afflicted individuals experiencing untimely mortality resulting from liver failure or hepatocellular carcinoma. Such a scenario undermines the global target of eliminating viral hepatitis by 2030 [31]. Based on a meta-analysis examining the prevalence, frequency, and ramifications of viral hepatitis infections, research regarding the transmission of non-alcoholic fatty liver disease has demonstrated a correlation with chronic liver disease. The anticipated global prevalence rate of NAFLD is estimated at 24 percent, with a prevalence exceeding 30 percent observed in the Middle East and South America [15].

A case–control study on the risk factors for chronic liver disease conducted in central India reports that excessive body weight acts as a cofactor for the progression of liver disease across all etiologies [29,32]. In the context of non-alcoholic chronic liver disease (CLD), both diabetes mellitus and an elevated body mass index (BMI) persist as significant risk factors. Additionally, excessive body weight has been identified as a contributor to the development and advancement of liver disease across all etiologies.

A multicentric inquiry was undertaken in India within an inpatient context involving a sample size of 13,014 to investigate the factors linked to liver disease. The study findings

indicate that HBV is the most prevalent etiology (33.3 %), followed by HCV (21.6 %), alcohol consumption (17.3 %), and non-alcoholic fatty liver disease (12.8 %) [33]. Non-alcoholic fatty liver disease (NAFLD) has a prevalence of approximately 13% in Africa but is frequently under estimated due to issues of underdiagnosis and under reporting. The escalation of traditional natural medicine use and weight issues in the sub-Saharan African region warrants attention due to its correlation with a surge in liver fibrosis as documented in reference 36. HBV, HCV, and alcohol are the predominant etiological factors in Sub-Saharan Africa, accounting for 34 percent, 17 percent, and 18 percent, respectively, according to a study [34]. As per research undertaken in Togo, hepatitis B virus (HBV) accounts for 66 percent of chronic liver disease (CLD) cases, followed by alcohol abuse at 57 percent and hepatitis C virus (HCV) at 12.3 percent [34].

A study conducted in China, on the use of traditional herbal medicine and liver fibrosis, showed that using not clinically tested traditional herbal medicine increase in severe liver fibrosis [35]. The seroprevalence of hepatitis B surface antigen in Ethiopia is reportedly 6.0 percent, whereas the seroprevalence of HCV antibodies is 3.1 percent. Both the aforementioned viral agents have demonstrated a noteworthy impact on the development of chronic liver disease (CLD) as identified by relevant sources [36].

## 2.5. CONCEPTUAL FRAMEWORK

This examination drew upon a literature review to establish the theoretical foundation for this study. This frame work divides factors that are associated with medically confirmed chronic liver disease (CLD) into three distinct categories: socioeconomic factors, behavioral aspects, and clinical factors [23, 25, 26, and 28].

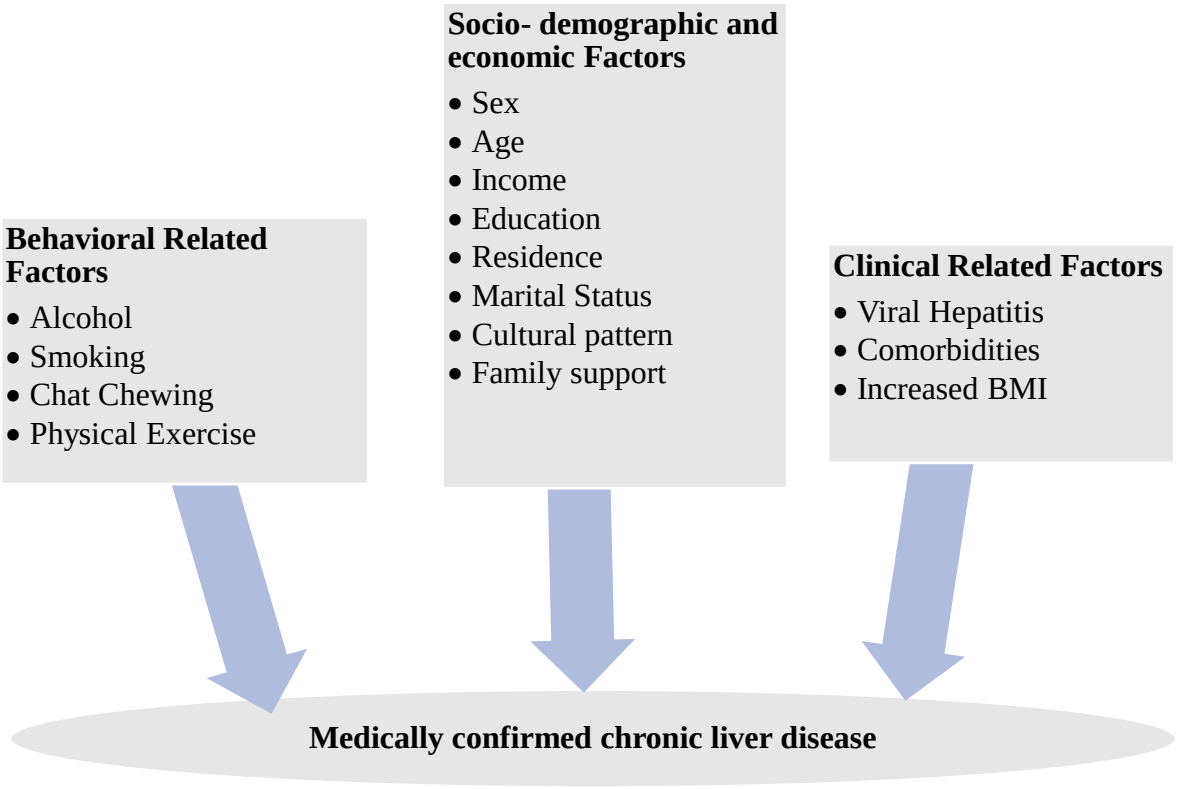



**Figure 1; Conceptual framework for the assessment of factors associated with medically confirmed chronic liver disease in West Arsi zone, Ethiopia, 2022.**

# 3. OBJECTIVES OF THE STUDY

## 3.1. GENERAL OBJECTIVE

- To assess the magnitude and factors associated with medically confirmed CLD in selected public health hospitals, West Arsi zone, Oromia, Ethiopia in 2022.

## 3.2. SPECIFIC OBJECTIVES

- To assess the magnitude of medically confirmed CLD in selected public health hospitals, West Arsi zone, Oromia, Ethiopia in 2022.
- To assess the factors associated with medically confirmed CLD in selected public health hospitals, West Arsi zone, Oromia, Ethiopia in 2022.

# 4. METHOD AND MATERIALS

## 4.1. THE STUDY AREA AND PERIOD

The region of West Arsi occupies a distinctive zone within the Oromia region of Ethiopia**.** Shashamane, located 249 kilometers from Addis Ababa, functions as the administrative focal point of the zone**.** Based on the 2007 census conducted by the respective agency, the western Arsi zone comprises a cumulative populace of 1,964,038, comprising 973,743 males and 990,295 females, gauged at a density of 96.46 individuals per unit area. Additionally, the region accommodates 272,084 inhabitants, constituting the urban community, which accounts for 13.85 percent of the total population. Within this region, a total of 387,143 residential units were recorded, presenting an average of 5.01 occupants per household alongside 369,533 identified housing structures [37]. The Oromo ethnic group dominates the demographic composition in Western Arsi region, which constituted 88.5% of the population. The Amhara ethnic group, on the other hand, represented a mere 3.98% of the total population. The residual population encompassing all non-specified ethnic groups, constituted a proportion of 7.5 percent. A predominant proportion of 87.34 % of the surveyed participants reported Afan Oromo as their primary language, while a smaller proportion of 6.46 % reported speaking Amharic as their primary language. The remaining 6.2 % of surveyed individuals indicated speaking other primary languages that were listed. In accordance with a report dated 2017, which was disseminated by the central statistics agency, it has been disclosed that a substantial proportion of the populace adheres to the Muslim faith, with 80.34 percent of individuals affirming their practice of the aforementioned belief. In addition, a smaller percentage of the population, comprising 11.04 percent, declared their association with Ethiopian Orthodox Christianity, while 7.02 percent of the populace vocalized their association with Protestantism [37]. Within the West Arsi zone, there exist seven governmental healthcare facilities, namely: Shashamane Comprehensive and Specialized Hospital, Melka Oda General Hospital, Dodola General Hospital, Gambo General Hospital, Negele Arsi Hospital, as well as the primary hospitals of Kokosa and Siraro. The study was conducted during the periods panning from February 2022 to July 2022, annotated as G.C. [37].

## 4.2. STUDY DESIGN

An institutional-based descriptive cross-sectional quantitative study design was conducted.

## 4.3. POPULATION

### 4.3.1. Source population

All medically confirmed and probable CLD patients in public hospitals of the West Arsi zone were the source population.

### 4.3.2. Study population

All patients were confirmed and/or probable chronic liver diseases in outpatient departments during the study period in selected hospitals.

### 4.3.3. Study Subjects

The study subjects were randomly selected confirmed and/or probable chronic liver diseases patients who visited the selected hospitals fulfilled the inclusion criteria.

## 4.4. INCLUSION AND EXCLUSION CRITERIA

### 4.4.1. Inclusive criteria

- All medically confirmed and/or probable CLD patients aged 18 years and above presented at selected hospitals who were signed the consent were included.

### 4.4.2. Exclusive criteria

- Any medically confirmed and/or probable CLD patients who were critically ill and cognitively impaired were excluded.

## 4.5. SAMPLE SIZE CALCULATION

To ascertain the appropriate sample size, a formula for a singular population proportion was employed considering the infinitude of the population. The prevalence of chronic liver disease (CLD) was found to vary across different ethnic backgrounds. Within the African-American population, the prevalence was determined to be 3.9 % with a confidence limit of 95 %. Additionally, a margin of error of 5% was established, while the estimated rate of non-response was found to be 5 %. These findings highlight the importance of considering demographic factors when analyzing CLD prevalence. The determination of the sample size involved the use of the single population proportion formula with a 5 % margin of error and a 95 % confidence interval. Consequently, the calculated sample size was 403.

$n= z^2 * p (1-p) / d^2$

where -n – required sample size

z – confidence interval

p – Assumed previous proportion and

d – Margins of error

$n= (1.96)^2 * 0.39(1-0.39) / (0.05)^2$

n= 3.8416* 0.39* 0.61/0.0025

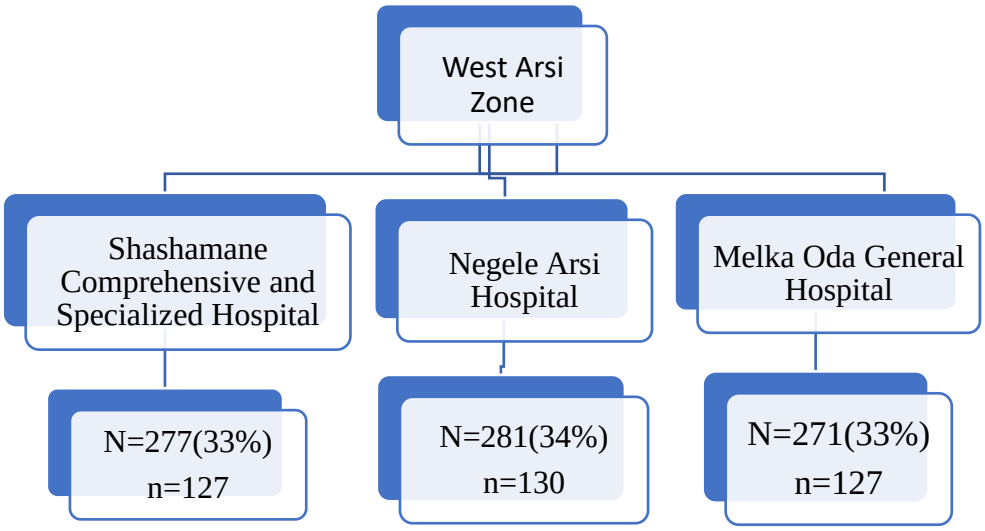
n= 0.91391664/0.0025

n= 366

The determined sample size, as ascertained through quantitative analysis, was 366 individuals. A slight increase of 5 % was applied to this value to accommodate anticipated nonrespondents. Consequently, the ultimate sample size amounted to 384. The participants for this study were selected using a systematic random sampling technique based on the estimated quantity of patients medically confirmed and/or probable CLD patients who visit the hepatologic unit.

**4.5.1. Sampling technique**

In the west Arsi zone, there were seven public hospitals (Shashamane Comprehensive and Specialized Hospital, Melka Oda General Hospital, Dodola General Hospital, Gambo General Hospital, Negele Arsi Hospital, Kokosa Primary Hospital, and Siraro Primary Hospital). Among these three hospitals were selected by using lottery method and the study participants were chosen using a systematic random sampling methodology every two patients.




**N**; Number of total CLD patients found in hospital. **n**; Number of samples drawn

***Figure 2;Schematic representation of sampling procedure used to assess the magnitude and factors associated with medically confirmed chronic liver disease in public hospitals of West Arsi zone, 2022.***

### 4.6. DATA COLLECTION PROCEDURES

#### 4.6.1. Questionnaires

The instrument used in this research was derived from the WHO step-wise approach to noncommunicable disease risk factors. The tool was subsequently refined to suit the study particular context**,** derived from the conceptual framework and variables of the investigation. The survey instrument was initially prepared in the English language and subsequently retranslated into Afan Oromo before being subjected to a retranslation process back to English. The sociodemographic characteristics, behavioral components, and clinically associated aspects of chronic liver disease (CLD) were derived from a primary source of data gathered through a face- to-face interview using structured and semi-structured questionnaires.

#### 4.6.2 Data Collectors

Data collectors were selected from each hospital based on their experience and ability to speak, read, and write well in Afan Oromo and Amharic. Each hospital had one BSc nursing supervisor with two years of experience. As data collectors, three BSc nurses were

assigned. All data collectors and supervisors were received two days of training on the data collection tools.

### 4.7. DATA QUALITY CONTROL

To ensure consistency, a questionnaire was composed in the English language, subsequently translated into Afan Oromo, and thereafter re-translated into English before the start of the investigation. The training event spanning two consecutive days was diligently conducted with the attendance of the appointed data collection personnel and their supervisors. The designated supervisors with the lead investigator regularly monitored the data collectors to guaranty the precise data collection. Any discrepancies were promptly identified and rectified at the study site. On a daily basis, designated supervisors diligently scrutinized the acquired data to ensure its coherence and comprehensiveness. To evaluate the suitability of phrasing, question clarity, and respondent response to the questions, a preliminary examination was carried out on 5% of the patients' designated sample size. A pretest was administered at Dodola Hospital to evaluate the soundness and consistency of the methods and resources used. Twenty individuals who originated from outside the targeted research area but possess comparable characteristics were recruited for this purpose. The results were employed for enhancement of the instrument. The supervisors undertaken a regular review of the questionnaire for completeness daily during actual data gathering. Similarly, the lead investigator conducted a periodic examination of the questionnaire at the data collection site at intervals of three days. The weight of each patient was determined by using pre-calibrated weighing scales while ensuring that the patients were attired in light clothing and barefoot. The weighing scales were checked and adjusted at zero level between each measurement and the instrument was calibrated daily by known object. Height was measured by following the standard procedures [38].

### 4.8. STUDY VARIABLES

#### 4.8.1. Dependent Variable

- Medically confirmed chronic liver disease

#### 4.8.2. Independent Variables

- Socio-demographic and economic characteristics: age, gender, education, marital status, family support, and monthly income.

- Risk behaviors: smoking, alcohol use, chewing khat, and lack of exercise.
- Clinically related factors: presence of comorbid disease; DM, HIV/AIDS, Viral Hepatitis, NAFLD, Herbal medicine, BMI.

### 4.9. OPERATIONAL DEFINITIONS

**Heavy alcohol consumption:** If the patient drinks alcohol of any type either fabricated or locally made greater than 20 gram or 20 ml per day that lasts over six months [23, 26].

**Khat chewing:** was when the patient was using chat of any dose on a daily basis that lasts over six months.

**Cigarette smoking:** was when the patient was using cigarettes of any dose on a daily basis that lasts over six months [28, 29].

**Physical Inactivity:** If a patient did not engage in moderate-intensity aerobic physical activities (brisk walking, hand mopping, gardening, swimming, or cycling for leisure purposes) for less than 30 min per day for three days, or if a patient did not engage in vigorous-intensity aerobic physical activities (jogging/running, soccer playing, digging with shovel, basketball/tennis playing, and martial arts/equivalents) for less than 15 minutes per day for two days [26].

**Chronic liver disease (CLD)** is progressive deterioration of liver functions that lasts over six months [1].

**Medically confirmed CLD (Yes):** is CLD confirmed medically in addition to sign and symptoms also diagnosed using biochemical tests and radiological studies.

**Probable CLD (No):** is clinically suspected CLD but not medically confirmed.

**Family support:** Any support from family members toward the management of chronic liver disease [26].

**Factors are** classified and presented into the following categories: socio-economic factors, behavioral factors, and clinical related factors [26]

### 4.10. DATA PROCESSING AND ANALYSIS

The collected data was checked for completeness, coded and entered into Epi data version 4.6. and exported to SPSS version 25 for analysis. Descriptive statics like, frequency and SD were calculated. The statistical technique of binary logistic regression was employed to perform both bivariate and multivariate analyses to assess the association between dependent and independent variables. In the bivariate analysis, those variables with p-

values < 0.25 at 95 % CI in bivariate logistic regression analysis were included in the multivariate analysis. Finally, variables that showed p-value less than 0.05, with 95 % CI were considered statically significant factor for chronic liver diseases (39).

### 4.11. DISSEMINATION OF THE RESULT

The result of the study was submitted and presented to AAU, college of health sciences, school of nursing and midwifery as partial fulfillment for the requirement of master's degree in Adult Health Nursing. The final result of this thesis was accessed to AAU, health science college library as the source for future learning. It will also be disseminated to West Arsi Zone and presented at various seminars, meetings, and workshops which can provide basic information about the health professionals' knowledge and practice toward the delivery of quality health services. Attempt will be made to offer the hard copy for each study hospitals which will be used as an input for health care professional training and development. Finally, repeated attempts will be made to access the information through scientific publications for other researchers.

### 4.12. ETHICAL CONSIDERATIONS

The study was conducted after approved by Institutional Review Board (IRB) of Addis Ababa University, Health Sciences College (protocol number: 18/22/SNM, meeting number: 10/2014EC). A letter was received from the School of Nursing and permission to conduct the study was offered from the chief clinical director, matron officer, and gastroenterology unit coordinators. The study was conducted per the declaration of Helsinki. Before data collection, the purpose and objective of the study were described to the study participants, and verbal and written informed consent was obtained. Besides, respondents were informed to terminate the interview any time. Confidentiality of the information was secured throughout the study process using code instead of any personal identifier and is meant only for the study.

# 5. RESULTS

## 5.1. SOCIO-DEMOGRAPHIC CHARACTERISTICS

A total of 384 adult individuals were included in this study with 100% response rate. Out of the entirety, 224 individuals (58.3 %) were male participants. Most of the respondents were married 191 (49.7 %), the mean age of the respondents was 42.77 ± 13.110, while 102 (26.6 %) were having secondary school educational level, 84 (21.9 %) of the respondents were government employees, and 209 (54.4 %) of respondents were resides in urban, the average monthly income of respondents was 2613.50 ± 1495.942 (Table 1).

**Table 1: Distribution of socio-demographic characteristics of study participants at selected public hospitals, West Arsi zone, Oromia, Ethiopia 2022 (n=384)**

| Variables | Response | n (%) |
|---|---|---|
| **Sex** | Male | 224 (58.3%) |
| | Female | 160 (41.7%) |
| **Marital Status** | Married | 191 (49.7%) |
| | Single | 130 (33.9%) |
| | Divorced | 40 (10.4%) |
| | Windowed | 23 (6.0%) |
| **Age in years*** | Mean age | 42.77 ± 13.110 |
| **Educational status** | Can't read and write | 36 (9.4%) |
| | Able to write and read | 79 (20.6%) |
| | Primary | 70 (18.2%) |
| | Secondary | 102 (26.6%) |
| | Diploma and above | 97 (25.3%) |
| **Occupational status** | Government employee | 84 (21.9%) |
| | Merchant | 83 (21.6%) |
| | Farmer | 83 (21.6%) |
| | Student | 44 (11.5%) |
| | Other | 90 (23.5%) |
| **Residence** | Urban | 209 (54.4%) |
| | Rural | 175 (45.6%) |
| **Average monthly income*** | ETB | 2613.50 ± 1495.942 |

**Note:** *mean ± standard deviation, ETB: Ethiopian birr, Km: kilometer
[a]: other occupational status includes; housewife, daily laborer, and Retired.

## 5.2. THE BEHAVIORAL AND SOCIO-CULTURAL CHARACTERISTICS OF THE STUDY PARTICIPANTS

Of the total respondents**,** 280 (72.9 %) drank alcohol > 20 ml daily, 110 (28.6 %) were smoke cigarettes, 222 (57.8 %) were khat chewers, 280 (72.9 %) were eat high animal-fat foods, 284 (74.0 %) were eat fruit and vegetables, 216 (56.2 %) were used herbal medicines, 226 (58.9 %) were engaged in sustained physical activity, and 274 (71.4 %) were received support from their families in adhering to treatment (Table 2).

**Table 2 : Behavioral and socio-cultural characteristics of study participants at selected public hospitals, West Arsi zone, Oromia, Ethiopia 2022 (n=384)**

| Variables | Response | n (%) |
|---|---|---|
| **Alcohol consumption >20ml per day** | Yes | 280 (72.9%) |
| | No | 104 (27%) |
| **Smoking cigarettes** | Yes | 110 (28.6%) |
| | No | 274 (71.3%) |
| **Chewing kchat** | Yes | 222 (57.8%) |
| | No | 162 (44%) |
| **Consuming high animal fatty diets** | Yes | 280 (72.9%) |
| | No | 104 (27%) |
| **Consuming Fruit and vegetable** | Yes | 284 (74.0%) |
| | No | 100 (26.0%) |
| **Herbal medicine use** | Yes | 216 (56.2%) |
| | No | 168 (43.7%) |
| **Regular physical activity** | Yes | 226 (58.9%) |
| | No | 158 (41.1%) |
| **Family support** | Yes | 274 (71.4%) |
| | No | 110 (28.6%) |

**Note:** ml: milliliter

### 5.3. THE CLINICAL CHARACTERISTICS OF THE STUDY PARTICIPANTS

The results of this study revealed that 240 (62.5%) of participants did not have a familial history of chronic liver disease, 88 (22.9%) reported no familial death attributed to chronic liver disease (CLD), 225 (58.6%) of them possessed medical insurance, 196 (51%) stated that it had not infected them with viral hepatitis, 214 (55.7%) reported no comorbidity, and the body mass index (BMI) of the study participants was a mean standard deviation (SD) measurement of 22.8 + 6 $kg/m^2$.

**Table 3 : Distribution of clinical related characteristics of study participants at selected public hospitals, West Arsi zone, Oromia, Ethiopia 2022 (n=384)**

| Variables | Response | n (%) |
|---|---|---|
| **Family history of CLD** | Yes | 143 (37.2%) |
| | No | 240 (62.5%) |
| **Family death due to CLD** | Yes | 58 (15.1%) |
| | No | 88 (22.9%) |
| **Medical Insurance** | Yes | 225 (58.6%) |
| | No | 130 (33.9%) |
| **Viral hepatitis infection** | Yes* | 159 (41.4%) |
| | No | 196 (51%) |
| **Co-morbid disease** | Yes** | 170 (44.3%) |
| | No | 214 (55.7%) |
| **Body Mass Index** | Health Weight (18.5-24.9 $Kg/m^2$) | 207 (53.9%) |
| | Under Weight (<18.5 $Kg/m^2$) | 21 (5.4%) |
| | Over Weight (25-29.9 $Kg/m^2$) | 102 (26.5%) |
| | Obese (30-34.9 $Kg/m^2$) | 54 (14%) |

**Note:** CLD: chronic liver disease, NAFLD: non-alcoholic fatty liver disease, $Kg/m^2$: kilograms per meter square

[a]: *: were embraces viral hepatitis B and C.

[b]: **: were embraces diabetes mellitus, HIV/AIDS, heart disease, non-alcoholic fatty liver disease (NAFLD), and hypertension.

## 5. 4. FACTORS ASSOCIATED WITH CHRONIC LIVER DISEASES

In the bivariate analysis the factors that have association with medically confirmed CLD were being men, getting old age, residing in urban, having a family history of chronic liver disease (CLD), consuming alcohol, smoking cigarettes, chewing khat, performing regular physical activity, consuming animal fatty diet, having medically confirmed viral hepatitis, having comorbidity, using herbal medicine, and being overweight were found to be significantly associated at a P-value of less than 0.25.

In the multivariate model, nine factors were associated with medically confirmed CLD: having a family history of CLD, drinking alcohol > 20ml daily, smoking cigarettes, khat chewing, consuming high animal fatty diet, being infected with viral hepatitis, having comorbidity, using herbal medicines, and being overweight.

Having a family history of CLD had 5.23 times more likely to develop medically confirmed CLD than those who did not having a family history of CLD (AOR=5.23 (95 % CI=2.59-12.13). Drinking alcohol greater than 20ml daily had 13.53 times more likely to develop medically confirmed CLD than those who did not (AOR=13.53 (95 % CI: 5.50-33.29). Smoking cigarettes had 4.15 times more likely to develop medically confirmed CLD than those who did not (AOR=4.15 (95 % CI: 1.70-10.14). Chewing khat had 2.33 times more likely to develop medically confirmed CLD than those who did not (AOR=2.33 (95 % CI: 1.13-4.77). Consuming high animal fatty diet had 3.97 times more likely to develop medically confirmed CLD than those who did not (AOR =3.97 (95 % CI: 1.67-9.42). Being infected with viral hepatitis B and C had 18.15 times more likely to develop medically confirmed CLD than those who did not (AOR =18.15 (95 % CI: 7.47-44.09). Having comorbidity had 3.58 times more likely to develop medically confirmed CLD than those who did not (AOR =3.58 (95 % CI: 1.65-7.77). Using herbal medicines had 9.84 times more likely to develop medically confirmed CLD than those who did not (AOR =9.84 (95 % CI: 4.58-21.13). Being overweight had 2.68 times more likely to develop medically confirmed CLD than those with normal weight (AOR =2.68 (95 % CI: 1.05-6.81). These associations were deemed statistically significant at a p-value of $\leq 0.05$ (Table 4).

**Table 4 : Significant variables only using backward variable selection to identify factors associated with medically confirmed CLD at selected public hospitals, West Arsi zone, Oromia, Ethiopia 2022 (n=384)**

| | | CLD | | | | |
|---|---|---|---|---|---|---|
| **Variables** | **Response** | **Yes** | **No** | **COR (95%CI)** | **AOR (95%CI)** | **P-value** |
| Family history of CLD | Yes | 109 | 34 | 3.10 (1.95-4.91) | 5.23 (2.25-12.13) | <.001*** |
| | No | 122 | 118 | 1 | 1 | |
| Alcohol intake > 20ml daily | Yes | 208 | 72 | 10.17 (5.95-17.37) | 13.535 (5.50-33.29) | <.001*** |
| | No | 23 | 81 | 1 | 1 | |
| Smoking cigarettes | Yes | 97 | 13 | 7.79 (4.17-14.57) | 4.15 (1.70-10.14) | .002** |
| | No | 134 | 140 | 1 | 1 | |
| Chewing khat | Yes | 158 | 64 | 3.01 (1.96-4.35) | 2.33 (1.13-4.77) | .021** |
| | No | 73 | 89 | 1 | 1 | |
| Consuming high animal fatty diet | Yes | 187 | 93 | 2.74 (1.72-4.35) | 3.97 (1.67-9.42) | .002** |
| | No | 44 | 60 | 1 | 1 | |
| Viral hepatitis | Yes | 157 | 31 | 8.35 (5.15-13.51) | 18.15 (7.47-44.09) | <.001*** |
| | No | 74 | 122 | 1 | 1 | |
| Co-morbid disease | Yes | 130 | 44 | 3.18 (2.06-4.93) | 3.58 (1.65-7.77) | .001** |
| | No | 101 | 109 | 1 | 1 | |
| Using herbal medicines | Yes | 184 | 32 | 14.80 (8.93-24.51) | 9.84 (4.58-21.13) | <.001*** |
| | No | 47 | 121 | 1 | 1 | |
| Body Mass Index (BMI=kg/m$^2$) | 18.5-24.9 | 114 | 93 | 1 | 1 | 0.108 |
| | <18.5 | 14 | 7 | 1.26 (.55-2.87) | 1.488 (.253- 8.745) | 0.66 |
| | 25-29.9 | 71 | 31 | 1.84 (.55-6.12) | 2.681(1.054-6.817) | .038* |
| | 30-34.9 | 32 | 22 | 1.84 (.75-4.49) | .65 (.22-1.90) | 0.44 |

**Note:** COR: crude odds ratio, AOR: adjusted odds ratio, CI: confidence interval, CLD: Chronic Liver Disease, NAFLD: Non-Alcoholic Fatty Liver disease, ml=Mil litter,

[a]**:**1 = Reference

[b]**:** BMI: <18.5=Under Weight, 18.5-24.9=Health Weight, 25-29.9=Over Weight, 30-34.9=Obese

[c]**:** *p < .05 **p < .01 ***p < .001

# 6. DISCUSSION

This study showed that the magnitude of medically confirmed chronic liver diseases among adults was 231 (60.2 %,) which was in line with a study conducted in sub-Saharan Africa, there is a high burden of cirrhosis where more than 50% of patients are admitted to hospitals with end-stage chronic liver disease (12). From 231 (60.2%) male's accounts 143 (37.26 %), while 88 (22.93 %) of medically confirmed were female adults which in lines with the study conducted in Europe and Mexico (21, 24). Even if it is difficult to conclude that based on the percentage literatures described that due to the protective effect of estrogen hormone females are less likely to develop medically confirmed chronic liver disease than males (22, 23).

According to this study, people with a family history of chronic liver disease have a higher risk of developing medically confirmed CLD than people without such a history. From a scientific point of view, it can be assumed that chronic liver disease is not always a hereditary disease, but that several hereditary diseases trigger liver damage and lead to the development of chronic liver disease (40).

This study found that people who consume more than 20 ml of alcohol per day have a significantly increased risk of developing medically confirmed chronic liver disease (CLD) compared to people who do not consume alcohol. This result is consistent with the results of previous studies conducted in regions such as sub-Saharan Africa and central India (13, 23, 25, 26). It's safe to assume that prolonged alcohol consumption is known to increase the likelihood of developing alcoholic liver disease, a condition closely linked to free radical damage, oxidative stress, and the breakdown of liver cells that contributes to scarring of liver tissue. Consequently, this could lead to the occurrence of persistent liver disease and hepatocellular carcinoma (HCC), as reported in various studies (41, 42). The observed incongruity could be due to differences in the categorization criteria used to distinguish alcohol users from alcohol abstainers. In our study, as well as in other scientific studies, the benchmark for alcohol consumption was at least 20 milliliters per day, regardless of the actual amount of alcohol drunk. In contrast, alternative studies have used duration of alcohol consumption and quantity consumed as measures for categorizing

individuals into drinkers and non-drinkers. The previous research has used the standard Cut down, Annoyed, Guilty, and Eye-opener (CAGE) tool, which may not account for the specific amount of alcohol consumed. Research has shown that the amount of alcohol consumed, regardless of the type of alcohol consumed, has emerged as the primary determinant of chronic liver disease (CLD). The risk of developing this disease increased with intakes of more than 60 to 80 grams per day for men and more than 20 grams per day for women for a decade. Therefore, it is plausible that the observed variability is due to this underlying factor.

According to the results of this study, individuals with a history of smoking were more likely to develop medically confirmed chronic liver disease compared to non-smokers. This finding is consistent with the study conducted in different geographic locations, namely Sub-Saharan Africa, Central India, Copenhagen and China (13, 26, 28, 29). The occurrence of liver damage due to nicotine ingestion is due to the physiological process in which nicotine is absorbed through inhalation and rapidly metabolized in the liver. The observed incongruity could be due to differences in the categorization criteria used to distinguish smokers from nonsmokers. In our study, the benchmark for smokers was when the patient was using cigarettes of any dose on a daily basis, regardless of the actual quantity of cigarette smoked. In contrast, alternative studies have used quantity consumed as measures for categorizing individuals into smokers and nonsmokers. The previous research has used the risk of developing chronic liver disease increased with intakes of more than 10 grams daily to be subjected as smoker. Therefore, it is reasonable that the observed variability is due to this underlying factor.

This study found that there was a statistically significant association between a patient's history of khat chewing and the likelihood of chronic liver disease. This finding is consistent with the corresponding observation previously reported in a study conducted in Ethiopia (14, 36) and thus provides further evidence for the causal association between khat consumption and the development of chronic liver disease.

In this study, individuals who regularly eat a diet high in animal fat are more likely to have medically confirmed chronic liver disease than people who do not eat a high in animal fat diet. This study is in line with the study done in united states (43). A notable association

was found with regard to cholesterol consumption which may leads to unrestricted accumulation of cholesterol in liver parenchymal cells and affects the cell physiology of hepatocytes (13, 43).

This study found that patients who tested positive for hepatitis B and C viruses were significantly more likely to develop medically confirmed chronic liver disease than patients who did not develop viral hepatitis. This study is consistent with the results of previous research conducted in areas such as India, sub-Saharan Africa, Togo, and Ethiopia as documented in the literature (31, 34, and 36). The scientific justification that the histopathologic manifestations of viral hepatitis, particularly hepatitis B and hepatitis C, could induce cellular necrosis, an inflammatory response, cytokine formation, and hepatic fibrosis. Consequently, persistent hepatitis can lead to serious diseases such as cirrhosis, liver failure and hepatocellular carcinoma (16). Nevertheless, the significant relevance of the findings to the chronic liver disease area, this study is not exempt from its inherent limitations. Since the vast majority of participants did not have reviewable medical records, this presented a significant obstacle in collecting history of chronic viral hepatitis. Therefore, the impact of this significant variable was not assessed in this study.

In this study, people with comorbidities, specifically diabetes mellitus, HIV/AIDS, heart disease, nonalcoholic fatty liver disease (NAFLD), and hypertension, were more likely to develop medically confirmed chronic liver disease than those without such comorbidities. This finding is consistent with previous studies conducted in Ethiopia and central India and the global burden of NAFLD and NASH (14, 15, 16, 17, 18). This association may be due to the characteristic spectrum of NAFLD, which includes hepatic steatosis with no apparent secondary causes of liver fat accumulation. The drug used to treat the comorbidity and disease process can affect liver cell functions and leads to liver cell damage (43, 44).

This study showed that individuals who had taken herbal medications in the past had a higher risk of developing medically confirmed chronic liver disease than those without such a history. This finding is consistent with study done in China (35). The reason for this association can be traced back to the fact that the liver serves as a central organ in filtering toxins through a complicated metabolic process. During the metabolic process, certain herbs can damage liver cells by creating toxic metabolites (45).

It has also been found that individuals with a body mass index (BMI) in the range of 25 to 29.9 kg/m2 (classified as overweight) are more likely to develop medically confirmed chronic liver disease (CLD) than those individuals whose BMI was in the range of 18.5 to 24.9 kg/m2 (classified as a healthy weight), consistent with a study conducted in Ethiopia and central India (29,32). The underlying cause of this phenomenon is the positive association between body mass index (BMI) and the likelihood of developing chronic conditions associated with the accumulation of adipose tissue (46).

# 7. CONCLUSIONS AND RECOMMENDATIONS

## 7.1. CONCLUSIONS

The magnitude of medically confirmed CLD was 60.26 %. Being infected with viral hepatitis (hepatitis B and C viruses), indulging in the consumption of alcohol, using herbal medications, having familial background of the ailment, being a habitual smoker of cigarettes, regularly consuming a diet rich in animal fats, exhibiting symptoms of comorbid conditions such as diabetes mellitus, HIV/AIDS, heart disease, non-alcoholic fatty liver disease (NAFLD), and hypertension, engaging in the practice of khat chewing, and exhibiting the condition of being overweight were significantly associated factors with confirmed chronic liver disease.

## 7.2. RECOMMENDATIONS

In current study we consider working on identified factors associated with chronic liver disease is fundamental to reducing the occurrence, progression, complications of chronic liver disease and saving lives.

**For health care managers and providers**

Health care managers and providers should focus on providing proper health education concerning effective lifestyle and behavioral changes such as getting regular exercise for at least 30 – 45 min, avoiding or limiting consumption of alcohol less than 10 ml per day, limiting or avoiding chewing khat, avoiding consumption of animal fatty diets, and increasing fiber diets that helps to combat liver cell injury, decreases occurrence of comorbid diseases, increases good therapeutic prognosis, and working on early detection and treatment of viral hepatitis B and C is mandatory. Heath care providers need remind every patient on available self-care recommendation and assess smoking and counsel on how to quit.

**For policy makers and stake holders**

Strengthening policies that focus on viral hepatitis screening activities and following interventions focused on behavioral and life style changes, linking traditional healers to the health care systems, strengthen laws used to govern or control the local and modern alcoholic beverages.

**For researchers**

Further investigations will be necessary to better clarify which factors associated with chronic liver disease using necessary biochemical tests plays great role in development of confirmed chronic liver disease and in-depth surveys are needed to implement cost-effective prevention programs and novel treatments to tackle this problem.

# 8. STRENGETH AND LIMITATIONS OF THE STUDY

## 8.1. STRENGTHS OF THIS STUDY

- Included three public hospitals found at West Arsi-zone and believed to better represent the study area and enable generalization.
- Data were collected from patients through face-to-face interviews with patients; this helps me to have more complete information.

## 8.2. LIMITATIONS OF THIS STUDY

- The cross-sectional nature of the study, making it difficult to see the real cause-and-effect relationship.
- Private health facility and patients who didn't visit the health facility during the data collection didn't include.
- This study was the inability to perform biochemical tests.
- The response may have been affected by patient desirability and recall bias.

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# 10. ANNEXES

Addis Ababa University College of Health Sciences College, School of Nursing and Midwifery, Department of Nursing, Post Graduate Program

**ANNEX I: PARTICIPANTS INFORMATION SHEET**

- **Name of the investigator:** Beresa Lema (BSC).
- **Research title:** The magnitude and factors associated with chronic liver disease in selected public health hospitals, West Arsi zone, Oromia, Ethiopia 2022.
- **Purpose of the study:** The aim of this study was to assess the magnitude and factors associated with medically confirmed CLD in selected public health hospitals, West Arsi zone, Oromia, Ethiopia in 2022.
- **Study area and period:** This study was conducted in selected public hospitals of West Arsi zone, Oromia regional state, Ethiopia from February 2022 and July 2022.
- **Study procedure:** In the west Arsi zone, there were seven public hospitals; we selected three of them were selected using simple random sampling methods.
- **Confidentiality:** The information obtained was kept confidential and used only for research purposes. No one except the members of the research team had access to the information collected and the personal information of the respondents was not notified.
- **Benefits of the study:** For the participation of the study subjects in the study no payment was granted or had no any special privilege to them. But, participating in the study and giving your genuine information will provide great input to bring change in quality of CLD patients care.
- **Risks of the study:** The procedure did not bear any physical or psychological trauma. Furthermore, participants were not forced to respond to information.
- **Rights:** Participation in this study was fully voluntary. Participants were given the right to declare to participate or not in this study. if they decide to participate, they were given the right to with draw from the study at any time and also, they were told that they do not have to answer any question that they do not want to answer.

**ANNEX II: PARTICIPANTS CONSENT FORM**

How are you! I am_____ from_____

I am here to collect data on the study of the magnitude and factors associated with chronic liver disease in selected public health hospitals, West Arsi zone, Oromia, Ethiopia 2022. For this study there were three public hospitals included namely: Shashamane Comprehensive and Specialized Hospital, Melka Oda General Hospital and Negele Arsi Comprehensive and Specialized Hospital were selected using simple random sampling methods. Data were collected from CLD patients of selected hospitals. you are an important stakeholder in this study. Therefore, I would appreciate if you could allot some valuable time to provide some information for the study. The information you provide will be kept confidential; no unauthorized person has access to the information. Your participation in the study is fully voluntary; You have the right to declare not participate at any time in between and also you don't have to answer any question you are not willing to answer. This study is expected to provide input for appropriate change in policy and program for improving the health care service for CLD patients.

Contact address: If you have any doubt regarding to the study; please contact and speak to the principal investigator **Beresa Lema**, via phone number: **09-10-93-01-30**

Therefore, I declare my voluntary consent for participants in this study with my initials signature as indicated below.

Investigators Name_____ signature _____date__/__/2022

Data collector's Name_____ signature _____date __/__/2022

Having read the information stated above, would you like to participate in this study?

1.Yes ☐

2.No ☐

**ENGLISH QUESTIONARIES**

To assess the magnitude and factors associated with medically confirmed chronic liver disease in selected public health hospitals, West Arsi zone, Oromia, Ethiopia 2022.

**Instruction:**

Choose and circle the best response for you from the options under each question, then write the answer in the area provided for those to which you give a direct answer.

**III. English version Questionnaires**

Code _____Date of data collection_____ Name of Heath facility: _____

| **Section 1: - General information (socio-demographic and economic factors)** | | | |
|---|---|---|---|
| **Sr.no.** | **Variable** | **Category** | **Remark** |
| 101 | Age of patient | _____years | |
| 102 | Gender | 1. Male<br>2. Female | |
| 103 | Marital status | 1. Married<br>2. Single<br>3. Divorced<br>4. Widowed. | |
| 104 | Religion | 1. Protestant<br>2. Orthodox<br>3. Muslim<br>4. Other (specify-- | |
| 106 | Educational status of the patient | 1. Cannot read and write<br>2. Can write and read<br>3. Primary<br>4. Secondary<br>5. Diploma and above | |

| | | | |
|---|---|---|---|
| 107 | Occupational status | 1. Government employee<br>2. Merchant<br>3. Farmer<br>4. Daily laborer<br>5. Housewife's<br>6. Student | |
| 108 | Place of residence | 1. Urban<br>2. Rural | |
| 109 | Average monthly income of the family | _____birr | |
| 112 | Do you have a family history of CLD | 1. Yes<br>2. No | 114 If the answer is no. |
| 113 | Is there any death due to CLD in your family? | 1. Yes<br>2. No | |
| 114 | Does your family support you in your treatment | 1. Yes<br>2. No | 201 If the answer is no. |
| 115 | What types of support do you get from your family | 1. Diet preparation as recommended<br>2. Paying for drugs<br>3. Psychological support<br>4. others (specify_____) | |
| **Part ll. Concerning behavioral associated factors of CLD** | | | |
| **Sr.no.** | **Variable** | **Category** | **Remark** |
| 201 | Have you been drinking alcohol greater than 20ml daily? | 1. Yes ----------<br>2. No ---------- | 203 If the answer is no. |

| | | | |
|---|---|---|---|
| 202 | If yes, for question number 2.01 how frequently? | 1. Daily<br>2. Weekly<br>3. Sometimes<br>4. Other (specify_____) | |
| 203 | Have you been smoking cigarettes? | 1. Yes<br>2. No | 205 If the answer is no. |
| 204 | If yes, for question number 2.03 in what amount? | 1. Less than one sticks a day<br>2. One stick per day<br>3. two sticks per day<br>4. Three and more sticks per day | |
| 205 | Have you been chewing chat? | 1. Yes<br>2. No | 207 If the answer is no. |
| 206 | If yes, for question number 5 how frequently? | 1. some times<br>2. one time per day<br>3. two times per day<br>4. three times per day<br>5. more than three times per day | |
| 207 | Have you been exercising regular physical activity? | 1. Yes<br>2. No | 211 If the answer is no. |
| 208 | If yes, for question number 207 what type of exercise? | 1. Walking<br>2. Running<br>3. Jogging<br>4. Swimming<br>5. Other (specify) | |
| 212 | Do you eat fruits and vegetables? | 1. Yes<br>2. No | 214 If the answer is no. |
| 213 | If yes, for question number | 1. Once per week | |

| | | | |
|---|---|---|---|
| | 212 in a typical week, on how many days do you eat vegetables? | 2. Twice per week<br>3. Three and above per week | |
| 214 | Dou you consume foods high in animal fats | 1. Yes<br>2. No | 301 If the answer is no. |
| 215 | If yes, for question number 218 how often do you eat? | 1. Always<br>2. Sometimes<br>3. During holydays | |
| **Part III: Concerning clinical associated factors of CLD** | | | |
| **Sr.no.** | **Variable** | **Category** | **Remark** |
| 301 | Do you have another comorbid disease | 1. Yes<br>2. No | 303 If the answer is no. |
| 302 | If yes, for question number 3 What is your comorbid diseases | 1. Diabetes Mellitus<br>2. HIV/AIDS<br>3. Viral hepatitis (if yes Specify _____)<br>4. NAFLD<br>5. Other(specify)_____ | |
| 305 | Are health workers providing health education about your diseases | 1. Yes<br>2. No | 307 If the answer is no. |
| 306 | If yes, for question number 305 what types of education do they provide you? | 1. How to use medication<br>2. Foods<br>3. Doing exercises<br>4. Others (specify_____) | |
| 307 | Do you use any herbal medicine? | 1. Yes<br>2. No | 310 If the answer is no. |
| 308 | If yes, for question number 307 please specify | _____ | |

| | | | |
|---|---|---|---|
| 309 | Why you prefer to use herbal medicine? | 1. Because CLD don't have medical management<br>2. Peer influence<br>3. Poor prognosis with given medical treatment<br>4. For the purpose of rapid recovery<br>5. Other specify; _____ | |
| 310 | Do you have medical insurance? | 1. Yes<br>2. No | 312 If the answer is no. |
| 313 | Do you have medically confirmed CLD? | 1. Yes<br>2. No | |

**I. Anthropometric Measurement**

| **Measurement** | **Reading** |
|---|---|
| Height ($m^2$) | |
| Weight (Kg) | |
| Body mass index (BMI) = weight in kilograms /height in meters squared. | |

**QUESTIONNAIRES: -AFAN OROMO VERSION:**

THE MAGNITUDE AND FACTORS ASSOCIATED WITH CHRONIC LIVER DISEASE IN SELECTED PUBLIC HEALTH HOSPITALS, WEST ARSI ZONE PUBLIC HOSPITALS FROM FEBRUARY, 2022 – APRIL, 2022 G**.C.**

**Waraqaa eeyyamaa**

Ani maqaankoo Barasaa Lammaa jedhama, yuunivarsiitii finfinneetti insititiyutii saayinsii fayyaarraa, barataa digrii lammafaa muummee "MSc in Adult Health Nursing" kanan ta'e qorannoo tatasa'inaa fi haaldureewwan dhibee tiruu miidhaa guddaan irra ga'ef sababoota kan ta'uu danda'an adda baasuuf dhukkubsatoota dhibee tiruu qabanii hordooffii yaalaaf gara hospitaala kana dhufan irratti qorannoo taasisaan jira.

Isinis gaafii kanarratti hirmaachuuf filatamtaniittu. Gaaffii kana irratti maqaa keessan hingalmeessinu odeeffannoo gaaffii kanarratti guurramu marti iccitii ta'a. Kana jechuunis, odeeffannoon isin nuuf kennitan namoota qorannoo kana gaggeessaniin ala nama biraatiif dabarsamee hinkennamu. Gaaffii kanarratti hirmaattota hundumaaf lakkoofsa iccitii fayyadamna, maqaa kamiyyuu hinfayyadamnu. Yoo odeeffannoon bu'aa kana maxxanfame odeeffannoo waligalaa qofaatu mul'ata. Gaaffiin kun tilmaamaan daqiiqaa15 fudhata. Gaaffii kana irratti hirmachuun fedhii biliisaa irratti kan hundaa'edha. Gaaffileewwan ka'an deebisuuf yoo fedhii dhabdan, deebisuu dhiisuu niidandeessu. Marii kana yeroo feetan addaan kuttanii deemuus nidandeessu. Gaaffii kana irratti hirmaachuu keessaniif dhiibbaan qaamaas ta'e kan xinsammuu sirra ga'u hinjiru. Gaaffii kanarrattii hirmaachuu keessaniifi kanfaltii homaayyuu hin argattani. Gaaffii kanarratti hirmaachuun keessan sababoota dhibee tiruu dhukkubsatoota dhibeetiruu keessatti sababa ta'an adda baasuuf gargaara.

<u>Gaaffii kana irratti hirmaachuuf fedhii qabdaa?</u> 1) Eeyyee 2) Lakki

Namoota leenjii fudhatanii odeeffannoo kana funaananif eyyamni afaanii hirmaattota irraa kennameeraaf.

Odeeffannoo funaanaa: _____

Kooddii _____Guyyaa odeffannoon itti funaaname_____

Maqaa dhaabbata fayyaa: _____

| **Kutaa 1 ffaa : -** Gaaffilee bu'uuraa | | | |
|---|---|---|---|
| 101 | Umurii | Waggaa_____ | |
| 102 | Saala | 1. Dhiira<br>2. Dhala | |
| 103 | Haala gaa'elaa | 1. Kan heerumte<br>2. Kan hin heerumin<br>3. Kan wal-hiikan<br>4. Kan irraa du'e | |
| 104 | Amantaa | 1. Protestantii<br>2. Ortodoksii<br>3. Musliima<br>4. Kan biroo (ibsi)_____ | |
| 105 | Sab-lammii | 1. Oromoo<br>2. Amaara<br>3. Guragee<br>4. Tigiree<br>5. Garabira_____ | |
| 106 | Sadarkaa barnootaa | 1. Kan hinbaranne<br>2. Barreessu fi dubbisuu kan dandahu/ dandeessu<br>3. Sadarkaa tokkoffaa<br>4. Sadarkaa lammaffaa<br>5. Dippilomaa fi isa ol | |
| 107 | Gahee hojii | 1. Hojjetaa/ttuu mootummaa<br>2. Daldala/tuu<br>3. Qotee bulaa<br>4. Dafqan bula<br>5. Haadha manaa<br>6. Barataa/ttuu | |
| 108 | Bakka jireenya | 1. Magaala<br>2. Baadiyyaa | |

| | | | |
|---|---|---|---|
| 109 | Galii maatii giddugaleessan ji'atti | _____ | |
| 110 | Fageenya dhaabbilee fayyaa dhihoo irra qabdan kiiloomeetraan. | _____ | |
| 111 | Baay'inni maatiikee siindabalatee meeqaa? | Dhiira ___ Dhalaa____Waliigala ___ | |
| 112 | Maatiikee keessaa namni dhibee tiruun dhukkubsataa jiru ykn dhukkubsataa ture jiraa? | 1. Eeyyee<br>2. Lakki | |
| 113 | Maatiikee keessaa namni dhibee tiruun du'e jiraa? | 1. Eeyyee<br>2. Lakki | |
| 114 | Maatiinkee yaalii dhibeee tiruukeef deeggarsasiif kennuu? | 1. Eeyyee<br>2. Lakki | |
| 115 | Deggarsa akkamii siif taasisuu? | 1. Nyaata qofa naaf qophessun<br>2. Qorichaf qarshii naaf kaffalun<br>3. Deggarssa xinsammuu<br>4. Gara biraa (ibsi_____) | |

**Kutaa 2: Amalefannoo dhukkubsattota dhibee tiruu ilalchisee**

| **Lakk.** | **Gaaffilee** | **Gartuulee fi koodii** | **Akeektuu** |
|---|---|---|---|
| 201 | Dhugaatii alkolii of keessaa qaban nidhugdaa? | 1. Eeyyee<br>2. Lakki | Yoo lakkii ta'e gara 203 deemi |
| 202 | Yoom yoom dhugda? | 1. Guyya guyyaan<br>2. Yeroo tokko tokko<br>3. Torbee torbeen<br>4. Gara biraa (ibsi)_____ | |
| 203 | Tamboo nixuuxaa? | 1. Eeyyee<br>2. Lakki | Yoolakkiita'egara 205 deemi |

| | | | |
|---|---|---|---|
| 204 | Hangam xuuxa? | 1. Muka tokkoo gadi<br>2. Guyyaatti muka tokko<br>3. Guyyaatti muka lama<br>4. Guyyaatti muka sadii<br>5. Guyyaatti muka sadiif isaa ol | |
| 205 | Caatii niqaamaataa? | 1. Eeyyee<br>2. Lakki | Yoo lakkii ta'e gara 207 deemi |
| 206 | Yeroo akkam akkamii qaamata? | 1. Darbee darbee<br>2. Guyyaatti yeroo tokko<br>3. Guyyaattiyeroo lama<br>4. Guyyatti yeroo sadii<br>5. Guyyatti yeroo sadiiol | |
| 207 | Sochii qaamaa nitaasistaa? | 1. Eeyyee<br>2. Lakki | Yoo lakkii ta'e gara 209 deemi |
| 208 | Sochii qaamaa gosa akkamii taasista? | 1. Deemsa miillaa<br>2. Fiigicha<br>3. Sussukuu<br>4. Bishaan daakuu<br>5. Gara biraa (ibsi _____) | |
| 210 | Fuduraa ykn kuduraa nisoorattaa? | 1. Eeyyee<br>2. Lakki | Yoo lakkii ta'e gara 214 deemi |
| 211 | Torbaanitti yeroo meeqa sooratta? | 1. Torbanitti yeroo tokko<br>2. Torbanitti yeroo lama<br>3. Torbanitti yeroo sadii | |

| | | | |
|---|---|---|---|
| | | 4. Torbanitti yeroo hundaa | |
| 212 | Nyaata cooma beeladaa of keessaa qabu nisoorattaa? | 1. Eeyyee<br>2. Lakki | |
| 213 | Yeroo akkam akkamii sooratta? | 1. Yeroo hundaa<br>2. Darbee darbee<br>3. Yeroo ayyaanaa | |

**Kutaa-3: Gaaffilee sababoota dhibee tiruu waliin wal qabachuu danda'aniif**

| | | | |
|---|---|---|---|
| 301 | Dhibee tiruu malee dhukkuboota gara biraa niqabdaa? | 1. Eeyyee<br>2. Lakki | Yoo deebbiinke lakki ta'e gara lakk 305 tti ce'i |
| 302 | Dhukkuba gosa akkamii qabda? | 1. Dhuukkuba Kale<br>2. Dhuukkuba Sukkaraa<br>3. HIV/AIDS<br>4. Stroke<br>5. Dhuukkuba Onnee<br>6. Garabira (ibsi )_____ | |
| 305 | Ogessi fayyaa haala dhukkubakee irratti barnoota sif kennanii beekuu? | 1. Eeyyee<br>**2.** Lakki | Yoo deebbiinke lakki ta'e gara lakk 307 tti ce'i |
| 306 | Barnoota akkamii sifkennanii beekuu? | 1. Haala itti fayyadama qorichaa<br>2. Haalaa soorataa irrati<br>3. Sochii qaaamaa taasisuu irrati | |

| | | | |
|---|---|---|---|
| | | 4. Garabira (ibsi_____) | |
| 307 | Qoricha aadaa fudhattee nibeektaa? | 1. Eeyyen<br>2. Lakki | Yoo deebbiinke lakki ta'e gara 310 tti ce'i |
| 308 | Maqaa qorichoota aadaa fudhatteetu caqasi ykn katabi. | _____<br>_____ | |
| 309 | Maaliif qoricha aadaa fayyadamuu filatte? | 1. Dhiibeen tiruu waan qoricha hinqabneefi<br>2. Dhiibbaa hiriyyoota kiyyanii<br>3. Yaalamee waan naaf fooyya'uu dideefi<br>4. Dafee fayyuu waanan barbaadeefi<br>5. Kan hin ibbsammne yoo jiraate caqasi _____ | |
| 310 | Ishuransii fayyaa hawwaasatti fayyadamaa jirtaa? | 1. Eeyyee<br>2. Lakki | |
| 313 | Dhibee tiruu yaalaan mirkanaa'e qabdaa? | 1. Eeyyeen<br>2. Lakki | |

## I. Anthropometric measurement

| Safartuu | Hanga dubbifame |
|---|---|
| Dheerina ($m^2$) | |
| Ulfaatina (kgs) | |
| **Body mass index = weight in kilograms/ height in meters squared** | |