KNOWLEDGE AND PRACTICE OF HOUSEHOLD TRANSMISSION PREVENTION AMONG PEOPLE WITH CHRONIC HEPATITIS B ATTENDING LIVER CLINIC AT TIKUR ANBESSA SPECIALIZED HOSPITAL, ETHIOPIA

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SUMMARY PAGE

PROJECT TITLE: Knowledge and Practice of Household Transmission Prevention among People with Chronic Hepatitis B Attending Liver Clinic at Tikur Anbessa Specialized Hospital, Ethiopia

THEMATIC AREA: Hepatology and Infectious Disease

SUB-THEMATIC AREA: Hepatitis B Virus Infection

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FULL TITLE OF THE PROJECT

Assessment of knowledge and practice towards household transmission prevention among people with chronic hepatitis B attending liver clinic at Tikur Anbessa Specialized Hospital, Addis Ababa Ethiopia.

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ABSTRACT

Background: *Hepatitis B infection is a major global public health problem. Better disease related knowledge among Hepatitis B patients is important for prevention of transmission and facilitate screening of their sexual partners and household contacts.*

Objective: *To assess the level of knowledge and practice of household transmission prevention among people with chronic hepatitis B attending liver clinic at Tikur Anbessa Specialized Hospital, Ethiopia.*

Methods: *A cross-sectional study among 229 hepatitis B patients visiting liver clinic for follow up service was undertaken in 2021. Data were collected using a structured interviewer guided questionnaires and analyzed using descriptive and inferential statistical methods in SPSS 26.*

Results*: Mean age of respondents was 40 years, 68% were male, Mean total knowledge score was 11.1(79 out of 100) with 65% of respondents scoring ≥75 (defined as a high knowledge). In adjusted linear regression, age <40 years, presence of additional infected household members and disease duration >3 years were associated with higher knowledge score (R^2= 0.106, F=8.936, P<0.001).Mean total practice score was 4.7 with only 38.6% of paticipants scoring ≥6 (defined as good prevention practice). In Adjusted logistic regression, factors associated with poor practice were; low level of education (OR: 5.218; 95%CI: 1.34-20.23; p=0.017), being on anti HBV treatment (OR: 3.582; 95%CI: 1.04-12.33; p=0.043) and duration of follow up at TASH <2 years (OR: 2.93; 95%CI: 1.14-7.55; p=0.025).*

Conclusion*: Poor implementation of recommended prevention practices and misunderstandings about transmission were identified among chronic hepatitis B patients.*

Key words: *Chronic Hepatitis B, Household, Knowledge and Practice*

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ABBREVIATIONS AND ACRONYMS

AAU: Addis Ababa University

AASLD: American Association for the Study of Liver Disease

CHB: Chronic Hepatitis B

CHS: College of Health science

COVID-19: Corona Virus Disease 2019

DNA: Deoxyribonucleic Acid

ETB: Ethiopian Birr

FMOH: Federal Ministry of Health

HBeAg: Hepatitis B e Antigen

HBIG: Hepatitis B immunoglobulin G

HBsAg: Hepatitis B Surface Antigen

HBV: Hepatitis B virus

HCC: Hepatocellular Carcinoma

HCV: Hepatitis C Virus

HIV: Human Immunodeficiency Virus

PWID: People Who Inject Drugs

TASH: Tikur Anbessa Specialized Hospital

WHO: World Health Organization

1. Introduction

1.1. Background

Hepatitis B infection is a major global public health problem caused by the hepatitis B virus (HBV), an enveloped DNA virus that attack the liver, and can cause acute and/or chronic liver disease. WHO estimates that 296 million people were living with chronic hepatitis B infection, and it resulted in 820,000 deaths in 2019.[1] Sixty eight percent of overall global burden of hepatitis B infection occur in western Pacific and African regions of WHO, with estimated prevalence of 6.2% and 6.1% respectively.[2 3] A recent systematic review and Meta analysis of the prevalence of hepatitis B virus in Ethiopia showed that; overall pooled prevalence of HBV was 6% and among subgroups, pregnant women, healthcare workers, and HIV positive patients accounted for 5% for each group. [4]

In most countries where HBV is endemic, perinatal transmission remains the most important route and cause of chronic infection. In comparison, horizontal transmission, (i.e., household contacts, particularly child to child transmission), after exposure to infected body fluids is important route of infection in areas of intermediate prevalence.[5 6] The risk of developing chronic HBV infection (the presence of detectable HBsAg in the blood for longer than six months), after acute exposure ranges from 90% in newborns of HBeAg-positive mothers to 20%-50% in infants and children under 5 to less than 5% in adults.[7] In addition, the likelihood of progression to chronic disease is higher in immunocompromised individuals.[8 9 10] Between 20% and 30% of those who become chronically infected will develop cirrhosis and/or hepatocellular carcinoma (HCC). Overall, HBV accounts for around 53% of cases of HCC and 30% of cirrhosis. In Africa, both HBV and HCV infections are highly endemic and responsible for 80% of cirrhosis and HCC cases, with HBV being the main cause of end-stage liver disease. [11 12] Chronic liver disease caused by hepatitis B and hepatitis C virus infections, remains a significant public health problem in Ethiopia. It was reported that 12% of the hospital admissions and 31% of the mortality in medical wards in Ethiopian hospitals were due to chronic liver disease. [13]

Vaccination against HBV prior to an exposure is the best way to prevent HBV infection. This includes; universal vaccination for all infants and administration of HBIG and hepatitis B vaccine within 12 hours of delivery to infants exposed to HBV which can reduce transmission by at least 95%.[14 15 16] In addition AASLD guidelines recommend vaccination also for individuals

who are not immune to HBV and are at high risk of exposure or a poor disease outcome.[17] This includes; household and sexual contacts of persons with CHB, HIV-infected persons, persons who inject drugs (PWID), men who have sex with men, sex workers, health-care workers, individuals with underlying chronic liver disease and immunocompromised individuals.[17] Ethiopia also adapted the recommendation to offer HBV vaccine to people who are at increased risk of acquiring or transmitting the virus especially key population such as healthcare workers.[18] On top of this, HBsAg-positive persons should be counseled regarding transmission to others. Because of increased risk of acquiring HBV infection, household members and sexual partners should be vaccinated if they test negative for HBV serological markers. For casual sex partners or steady partners who have not been tested or have not completed the full immunization series, barrier protection methods should be utilized. [17] Thus screening sexual partners and household contacts is an efficient way of identifying additional people with HBV who can benefit from treatment and monitoring.[19]

However most individuals with chronic hepatitis B are unaware of their infection and thus will be less benefited from clinical care, treatment, and interventions designed to reduce onward transmission and disease progression. One explanation for the under-diagnosis of CHB and poor access to clinical care is a lack of awareness about the virus among people with, or at greater risk of hepatitis B infection.[20] This hypothesis is supported by improvements in healthcare-seeking behavior among people with CHB following educational interventions.[21] [22] The studies have shown that patients' good knowledge regarding transmission, prevention and treatment of Hepatitis B infection results in; improved screening and vaccination of high risk groups, limit the spread of the infection to the community, early detection and linkage to care for many undiagnosed cases, and lowered the risk of developing related complications and death among CHB patients.[23] [24]

However data regarding awareness and practice of CHB patients towards prevention of disease transmission is scarce worldwide, particularly in Africa. Therefore this study was aimed at assessing the level of knowledge and practice towards household transmission prevention among people with chronic hepatitis B attending liver clinic at TASH AAU.

1.2. Problem statement

A vast majority of individuals infected with viral hepatitis B live in low to middle-income countries of Africa and Asia, where screening and access to care and treatment are not readily available. [25] Even in U.S and Europe more than 75% of individuals with chronic HBV or HCV infection, or both, are unaware of their infection or often present with advanced disease and therefore do not benefit from clinical care, treatment, and interventions that are designed to reduce onward transmission. [26] In Africa over 90% of persons infected with hepatitis B and C were unaware of their condition, and as such they don't seek treatment.[27] Another report showed that; in Africa less than 1% of adults who tested positive for HBsAg at the community level had been previously tested and aware of their diagnosis.[28]

To curtail this problem, the WHO global health sector strategy on viral hepatitis, created in 2016, aims to achieve a 90% reduction in new cases of chronic hepatitis B and C and a 65% reduction in mortality due to hepatitis B and C by 2030 compared with the 2015 baseline.[29] Following this strategic plan for elimination of viral hepatitis, many countries in sub-Saharan Africa are now in the process of developing viral hepatitis management guidelines and strategic plans to achieve these goals of viral hepatitis elimination.[30] Although vaccination is effective in reducing the incidence of chronic disease in high prevalence countries, the effect on the incidence of advanced liver disease will not be seen for several decades. To prevent the life-threatening complications of cirrhosis, liver failure, and hepatocellular carcinoma, identification of individuals who are infected with HBV is essential to assess the need for treatment and set appropriate frequency of follow-up. Identifying those individuals is difficult because chronic hepatitis B is an asymptomatic disease, only presenting when complications arise. As a result, focused screening for high risk group is one of the recommended measures by international guidelines to overcome this challenge.[30 17]

Household members of CHB patients are among the group of populations with high risk of acquiring HBV infection. The significance of household transmission of HBV infection has been identified in different studies that at least a half of HBV infection in children could not be attributed to vertical transmission and in many endemic regions, prior to the introduction of neonatal vaccination peak prevalence was seen in children between 7-14 years of age.[5] Similarly, in another study that involved household members of CHB patients, about 14-60% of them have

serological evidence of resolved HBV infection, while 3-20% has chronic infection, with the highest risk for infection among sexual partners and children living in the household of a person with chronic HBV infection.[31] In a study conducted in Taiwan, the HBV infection rate was 65 percent among neonates born to HBsAg-negative mothers and HBsAg-positive fathers. Most of these transmissions are believed to result from close contact of the unprotected infants with the infected blood and body fluids of the fathers.[32] One study done in Ethiopia also found that non-perinatal transmission was highly prevalent route of transmitting the infection, and has important role in the maintenance of the high infection rate in Ethiopia.[33] Therefore screening family members, sexual partners, and household contacts is an efficient way of identifying additional people with HBV who can benefit from treatment and monitoring.[19]

In addition to lack resources and emphasis, one explanation for the under-diagnosis of CHB and poor access to clinical care is a lack of knowledge about the virus among people with, or at greater risk of hepatitis B infection. [20] This hypothesis was supported by improvements in healthcare-seeking behavior among people with CHB following educational interventions.[21] [22] Studies have shown that adequate knowledge of hepatitis B among CHB patients regarding risk of transmission to others and preventive practices positively influence both screening and vaccination of high risk groups, limit the spread of the infection to the community, leads to early detection and linkage to care for many undiagnosed cases.[23] [24] AASLD Guideline also recommend counseling of all CHB patients; as it will improves their knowledge and the practice of preventing viral transmission to others.[17] Lastly, Poor knowledge of Hepatitis B was associated with HBV-related stigma and misconceptions on modes of transmission leading to unnecessary actions taken by the patients which would disrupt their daily living and affect overall quality of life [34]

Thus assessing the knowledge and practice of chronic hepatitis B patients regarding transmission prevention would provide crucial information for prevention and control of HBV infection as well as in achieving its elimination goals. To date there are only few studies done targeting similar topic and population worldwide. In almost all of these studies, the practices of preventing HBV transmission to others were not adequately assessed. The status of household transmission prevention among people with chronic hepatitis B in Ethiopia is unknown. There are few studies in Ethiopia that have investigated the knowledge and practice of hepatitis B. All of these studies

focused on populations for which Hepatitis B is an occupational hazard. No study to date has assessed the knowledge and practice regarding household transmission prevention of HBV among people with CHB. Therefore this study aimed at assessing the level of knowledge and practice towards prevention of household transmission among people with CHB attending liver clinic at Tikur Anbessa specialized hospital, Addis Ababa University, Ethiopia.

1.3. Significance of the study

Since this study was the first hospital based-study aimed at assessing the of level knowledge and practice towards household transmission prevention among people with CHB patients, it will provide crucial baseline information for public health planners, policy makers and implementers to plan and design appropriate intervention strategies and therefore helpful in achieving the goals of HBV elimination. Moreover, the finding will help clinicians to see the status of CHB patients' knowledge and prevention practices and plan for necessary modification of their clinical approach. It will also serve as baseline data and pave the ways for further research in similar population.

2. Review of literatures

2.1. Transmission of HBV

In most countries where HBV is endemic, perinatal transmission remains the most important route and cause of chronic infection. In comparison, horizontal transmission, (i.e., household contact particularly child to child transmission), after exposure to infected body fluids is important route of infection in areas of intermediate prevalence.[5] This includes; exposure by sexual intercourse, medical/surgical procedures, or from sharing razors and tooth brushes contaminated with infected blood; contact with dermatological lesions, use of non sterile syringes and needles; tattooing; body piercing; and acupuncture. In contrast, HBV cannot be transmitted by hands shaking, sharing food utensils, kissing, hugging, coughing or sneezing [6 17 35 9 36]

Transmission of HBV from fathers to their infants is possible based upon genotypic and phylogenetic analysis. In a study conducted in Taiwan, the HBV infection rate was 65 percent among neonates born to HBsAg-negative mothers and HBsAg-positive fathers. Most of these transmissions are believed to result from close contact of the unprotected infants with the infected blood and body fluids of the fathers. [32]

Although perinatal transmission remains the most important route and cause of chronic HBV infection in sub-Saharan Africa including Ethiopia, one study showed importance horizontal transmission in Ethiopia. In a study that involved 54 mothers, 25 of them HbsAg positive (twenty one of the 25 (84%) had anti-HBe and none had HBeAg) and 29 mothers negative for HBsAg) and their families (husbands, infants and the infants' older siblings) were followed for two years, One case of vertical hepatitis B virus transmission was seen while horizontal transmission during the study period occurred in two infants and in two older siblings. The investigator concluded that potential risk factors for non-perinatal transmission were highly prevalent in both groups and may represent the main route of transmitting the infection, while, the vertical transmission of HBV infection only plays a minor role in the maintenance of the high infection rate in Ethiopia and suggested that vaccinating all babies soon after birth would, therefore, be an effective means of eradicating or reducing the hepatitis B virus infection and its sequellae. [33]

2.2. Prevention of HBV

Vaccination against HBV prior to an exposure is the best way to prevent HBV infection. A world health organization guidelines recommend universal vaccination for all live births [14] [15] In addition administration of HBIG and hepatitis B vaccine within 12 hours of delivery to infants exposed to HBV is recommended and can reduce transmission by at least 95 percent. [16] Transmission of HBV through breastfeeding is unlikely, particularly in infants who received HBIG and hepatitis B vaccine at birth. Thus those infants can be breastfed and should complete the hepatitis B vaccine series. Mothers with chronic hepatitis B who are breastfeeding should also exercise care to prevent bleeding from cracked nipples. Carrier mothers should not participate in donating breast milk. [37] [3] Cesarean delivery should not be routinely recommended for carrier mothers for the purpose of reducing HBV transmission since there were no clearly established benefit in well-conducted controlled trials [38]

In addition most international guidelines recommend vaccination also for individuals who are not immune to HBV and are at high risk of exposure or a poor disease outcome. This includes; household and sexual contacts of persons with CHB, HIV-infected persons, persons who inject drugs (PWID), men who have sex with men, sex workers, health-care workers, individuals with underlying chronic liver disease and immunocompromised individuals. [17] HBsAg-positive persons should be counseled regarding transmission to others and their household members and sexual partners should be vaccinated if they test negative for HBV serological markers. For casual sex partners or steady partners who have not been tested or have not completed the full immunization series, barrier protection methods should be utilized. [17]

In 2016 Ethiopian Federal Ministry of Health issued a national strategy for prevention of viral hepatitis in which the following focused interventions were listed; increasing awareness among health professionals and the general public, provision of safe and effective HBV vaccines including through universal childhood vaccination and in particular delivery of hepatitis B vaccine within 24 hours, to offer HBV vaccine to people who are at increased risk of acquiring or transmitting the virus (specially key population such as healthcare workers), implementation of blood safety strategies and safe sex practices by promoting behavioral change to avoid unprotected and multiple sexual activities. [18]

2.3. The knowledge CHB patients regarding HBV transmission and prevention

There are only few studies done in Asia, America and Australia assessing HBV knowledge among CHB patients. Most of them found overall low level of hepatitis B knowledge among CHB patients. [23 34 39 40]

A study done in Australia has identified hepatitis B knowledge gaps among people with CHB, particularly in those with a low level of academic education and in elderly. The mean total knowledge score was 55 out of 100 (standard deviation [SD]: 22) with a median score of 56 (inter-quartile range [IQR]: 36, 70), showing an intermediate level of overall hepatitis B knowledge among participants. [39] Another study done in Pakistan that involved 390 HB patients found that, 298 (76.4%) were within the poor knowledge range whereas 92 (23.6%) showed adequate knowledge about HB. [23] According to another study done in Malaysia, patients in age group of 30–39, those with tertiary education level and longer duration of HBV diagnosis were independent factors contributing to a higher knowledge score. [34]

An Australian study done by Hajarizadeh and his collegues, only 35 participants (38%) were aware of all four main routes of hepatitis B transmission (i.e. vertical, sexual contact, sharing injecting equipment, sharing toothbrushes or razor blades), while 33 participants (35%) were not aware of any transmission routes. Sexual transmission was the least familiar route of transmission, with 56% unaware that hepatitis B can be transmitted through sexual contact. About 40% of participants said HBV transmission can be prevented by washing hands before eating. [39] Similarly, a three-quarter of San Francisco residents with chronic hepatitis B who were interviewed did not voluntarily identify a possible risk factor for their infection and over half of respondents failed to demonstrate knowledge of recommended practices for preventing HBV transmission to close contacts. [40]

Misunderstanding regarding transmission and prevention of HBV infection has been reported in different studies. In Australian study; 25% of participants reported at least one misunderstanding about hepatitis B transmission. Among six misunderstandings about hepatitis B transmission routes (i.e. touching, kissing, sharing foods, coughing/ sneezing or sharing eating utensils), transmission through sharing eating utensils and kissing were the most common misunderstanding; with only 54% and 56% of participants, respectively, knowing that hepatitis B

could not be transmitted through these two routes. About 40% of participants said HBV transmission can be prevented by washing hands before eating. [39] In another Australian study, 25% of people with CHB believed hepatitis B could be transmitted by sharing food. [41] Misunderstanding about the transmission of hepatitis B through sharing food and utensils was identified also in a study done in china. [42]

2.4. The practice of CHB patients on prevention of HBV transmission

A study done in Pakistan reported; 129 (33.1%) showed good practice towards HBV prevention whereas two hundred and sixty one (66.9%) patients were categorized as having bad practice. When their response to individual question checked, 47.1% (n = 160) were ready to disclose their disease to their spouse. Two hundred and ninety three (75.1%) respondents had never asked their barber to use a new blade, or for safe and clean equipment before nose and ear piercing. The majority of the patients (n = 308, 79.0%) revealed that they avoided meeting with people after becoming infected with HB. [23] Australian study showed that 89% of respondents has informed family members of the need to get tested [39] According to a study done in USA, respondents were asked an open-ended question to name practices they use to prevent spreading HBV to others, and 41% of respondents said they did nothing; 20% reported using separate eating utensils and dishes or not sharing food; 12% said they had recommended hepatitis B vaccination to their close contacts or that their contacts were already vaccinated; and 3% said they had recommended HBV testing to their close contacts or that their contacts had been tested for HBV. When queried about specific preventive practices, 94% denied sharing toothbrushes or razors; 91% said that they cover open wounds; 12% said they recommended HBV testing to their close contacts who had not previously been tested; and 7% said they recommended HBV vaccination to their unvaccinated close contacts [40] Another study from Malaysia reported that; most of the respondents (91.7%) encouraged their immediate family members to undergo screening for HBV. For prevention of transmission, almost all the participants avoided sharing personal items such as razors and toothbrushes (98.3%) and did not engage in blood donation (99.0%), but a half of the participants (50.6%) avoided sharing eating and drinking utensils with others. [34]

Both Regional and Ethiopian data regarding knowledge and practice towards hepatitis B among CHB patients as well as the general population is scarce and however study done in Haramaya

University showed poor knowledge among the medical and health science students entering into the profession practice about the hazards of Hepatitis B, its mode of transmission and prevention [43] Another most recent study done among Healthcare Workers of Jimma University Medical Center, Southwest Ethiopia found that most participants had good knowledge of HBV (73.9%) and Standard precautions (82.2%) but only 42.6% had a good practice of Standard precautions. [44]

3. Objectives the study

3.1. General Objectives

- ✓ To assess the level of knowledge and practice towards household transmission prevention among people with chronic hepatitis B attending liver clinic at TASH AAU

3.2. Specific Objectives

- ✓ To determine the level of knowledge about HBV routes of transmission & prevention means
- ✓ To assess the degree of implementation of recommended precautions and practices to prevent household transmission
- ✓ To identify misunderstandings and wrong practices about prevention of HBV
- ✓ To detect socio-demographic variables associated with a high level of knowledge regarding prevention of household transmission
- ✓ To identify factors associated with poor practice towards household transmission prevention

4. Methods and Materials

4.1. Study setting

4.1.1. Study Area

This study was conducted at Tikur Anbessa specialized hospital (TASH) which is the main tertiary referral center in Ethiopia located in the capital, Addis Ababa. TASH is one of the leading referral tertiary health facilities that provide specialized and comprehensive medical care to the immediate community and beyond who are referred for specialty consultations and/or interventions. The hospital is also a teaching hospital for the Addis Ababa University, College of Health sciences and is involved in undergraduate, postgraduate and fellowship trainings in different fields of clinical medicine.

It has its own Gastroenterology division under the department of internal medicine that is responsible for taking care of clients with various GI and hepatology problems. It provides various gastroenterology and hepatology services which include the inpatient, outpatient and functioning endoscopy suite. Medical care is delivered to CHB patients by internal medicine residents, in close consultations with fellows and gastroenterologists. The Unit runs 3 days weekly outpatient clinic and on average up to 30-40 CHB patients are expected to visit the clinic every week as newly referred cases or for follow up. A total of 507 CHB patients had visited TASH liver clinic at least twice in the 12months periods (i.e., from January 2020- January 2021).

4.1.2. Study period

The study was conducted over a period from July-October, 2021

4.2. Study design

A hospital-based cross sectional study was conducted

4.3. Source population

The source population for this study was all CHB patients attending TASH liver clinic for follow up service.

4.4. Study population

The study population for this study was all CHB patients attending TASH liver clinic for follow up service during data collection period.

4.5. Sample size and sampling technique

Sample size was calculated using single proportion formula with the assumptions of confidence interval = 95%; critical value (Zα/2) = 1.96; and degree of precision (d) = 0.05. The population proportion (p) = 50% was used since there was no research done in the same setting concerning knowledge and practice for prevention of HBV household transmission.

$$n = \frac{(Z)^2(p.q)}{d^2}$$

Where,

n= sample size

p=population proportion rate = (50%), since proportion of patients coming to the clinic was unknown

Z=standard normal variable that at the confidential level of 95%

d= margin of error which is 5%

q= 1-p

$$n = \frac{(1.96)^2(0.5x0.5)}{(0.05)^2} = 384.16 \approx 384$$

n=384

Since the source population is less than 10,000, the sample size was adjusted using the correction formula;

$N_f = n_i/(1+ n_i/N)$

where

n_i= initial sample size

N_f= new sample size

N (total population) =507

Therefore:

Nf: 384/(1+384/507)

Nf: 384/1.76= 218

N_f= 218

Then 10% of the new sample size was added by considering for non-response rate.

➔ (10/100) x 218 =22. Therefore the sample size for this study is approximately 22+218=240

A convinience sampling method was used to recruit 240 adult patients with confirmed chronic hepatitis B infection from those who visited the TASH liver clinic during four months periods of data collection.

4.6. Inclusion and exclusion criteria for patients

4.6.1. Inclusion criteria

The study included; (1) patients with confirmed diagnosis of CHB infection (HbsAg-positive persistence for more than 6 months) and had at least two visit at the TASH liver clinic (2) aged 18 years and above, (3) able to speak and understand either English, Amharic or Afan Oromo languages and (4) understood the study objectives and voluntary to be interviewed.

4.6.2. Exclusion criteria

Patients with known cognitive or mental disorders and those who are seriously ill were excluded from the study.

4.7. Study variables

4.7.1. Independent variables

Independent variables were; the participant's demographic details and clinical data that might influence the dependent variables. These are; Age, sex, marital status, occupation, level of education, region, disease duration, duration of follow up at TASH, treatment status and if anybody else in the household is infected.

4.7.2. Dependent variables

- ✓ The level of knowledge of transmission and prevention of HBV
- ✓ The degree of practices towards household transmission prevention of HBV

4.8. Operational definition

CHB: The presence of detectable HBsAg in the blood for longer than six months

Household members: household refers to a social unit of people who live together under one roof and share resources, even if they are not related to each other. [45]

Knowledge is defined as the fact or condition of being aware of something. [46] In this study it will be used to assess patient's awareness on modes of HBV transmission and how to prevent it.

Overall knowledge of individual respondents regarding HBV transmission and prevention was assessed by 14 questions. Each of 14 knowledge questionnaire had three possible responses: yes, no, or don't know. The responses was scored by assigning a value of 1 to correct answers and a value of 0 to wrong answers and don't know. A total knowledge score was presented on the scale of 100 and to categorize knowledge score the total score was dichotomized as high (≥75 out of 100 (≥11 out of 14)) and low to intermediate if <11(75%) using a top quartile score as cut of point as defined by previous studies [39 47]

Practice: is defined as; to carry out, to apply or to do or perform often, customarily, or habitually.[48] In this study, it was used to assess degree of implementation for recommended measures to prevent HBV transmission with in the household.

The practice of individual respondents regarding household transmission prevention of HBV was assessed by seven 'yes' or 'no' questions. Each correct response was given a score of "1" while an incorrect answer given a score of "0". The total score was categorized using a top quartile score, as good for a score between 6 and 7 points and fair to poor if <6 (<75 out of 100).

4.9. Data collection procedures

4.9.1. Data collection instruments

Data was collected using a pre-tested, structured and interviewer guided standardized questionnaire adopted from related studies. [39] [23] [40] The questionnaire was prepared in English and translated in to Amharic and Afan Oromo Languages. A structured questionnaire containing 31 items with 3 sections, covering the socio-demographic and clinical characteristics of the patients (10 questions), patients' knowledge related to HBV transmission and prevention (14 questions), and (7 questions) to assess the practice towards prevention of HBV household transmission were used for data collection. The nurses who had access to patients' medical record number were asked to select CHB patients and give their lists for the data collectors after routinely taking their vital statistics. A simple random sampling method was used to select the participants from the lists. Then Patients were invited to participate in the research while they were waiting for his/her turn at follow up clinic or after seen by their doctors. Participation was strictly voluntarily and consent was obtained orally and confidentiality assured prior to partaking in the study.

The questionnaire was validated by doing pre-test on 5% of the sample before the actual data collection period. Furthermore, the reliability of the questionnaires was checked, and their using SPSS Cronbach Alpha value was 0.93 and 0.729 for questions of knowledge of transmission and prevention and prevention practice respectively.

4.9.2. Data quality management

First the questionnaire was prepared in English and translated to Amharic and Afan Oromo and then pretested on 5% (11 patients) CHB patients. Necessary modification of the questionnaires was carried out based on the pre-test feedback. The data collectors were the investigator and staff nurses and medical interns. Adequate orientation was given to data collectors on the aim of the research, content of the questionnaire, and the data collection process. The data was collected on three days/week (i.e. during the clinic weekly service). Investigator also supervised the data collection processes regularly during the whole period of data collection. The collected data was being checked every day by investigator for its completeness and consistency.

4.9.3. Data analysis

Data were analyzed using SPSS version 26 statistical packages. Descriptive variables were expressed as frequency, percentages, mean, standard deviation and abnormally distributed variables as median. Bivariate analyses (independent t-test, chi-square & ANOVA) were conducted to test the associations between dependent and selected independent variables. The association was further assessed using regression analysis for the variables that showed significance on bivariate analysis. A P-value < 0.05 was considered to be statistically significant in all cases.

4.10. Ethical consideration

Before conducting the study, the study proposal was submitted for approval to the department of internal medicine and ethical clearance was obtained from ethical review committees of the department and the college of health sciences. The study was started following endorsement by the committees. Participants' involvement in the study was on voluntary basis and informed consent was reviewed for all participants. No personal identifiers were used on the data collection form. Collected data were only accessed by the investigators and confidentiality was be maintained at all levels of the study.

5. Results

5.1. Demographic characteristics of respondents

Of 240 sampled and eligible for interviews, only 229 chronic HBV patients who were included in this study; making the response rate 95 percent. 156(68.1%) respondents were male and 73(31.9%) were female. Participants had a mean age of 39.8(±11) years. 183(79.9%) of the them were married and 41(17.9) were single. Majority (71.1%) of respondents have had at least attended secondary education. 125(54.6%) participants were either government or private employed while 28(12.2%) had no job. About 2/3rd of participants (69%) were residents of Addis Ababa. The mean duration of illness from time of diagnosis was 4.8(±4.2) years and mean duration of follow up at TASH was 3.2(±2.7) years. The majority of them (69%) have never received any specific treatment for HBV and 92.1% of the participant had no additional household member infected with HBV. *Table 1* shows general characteristics of respondents.

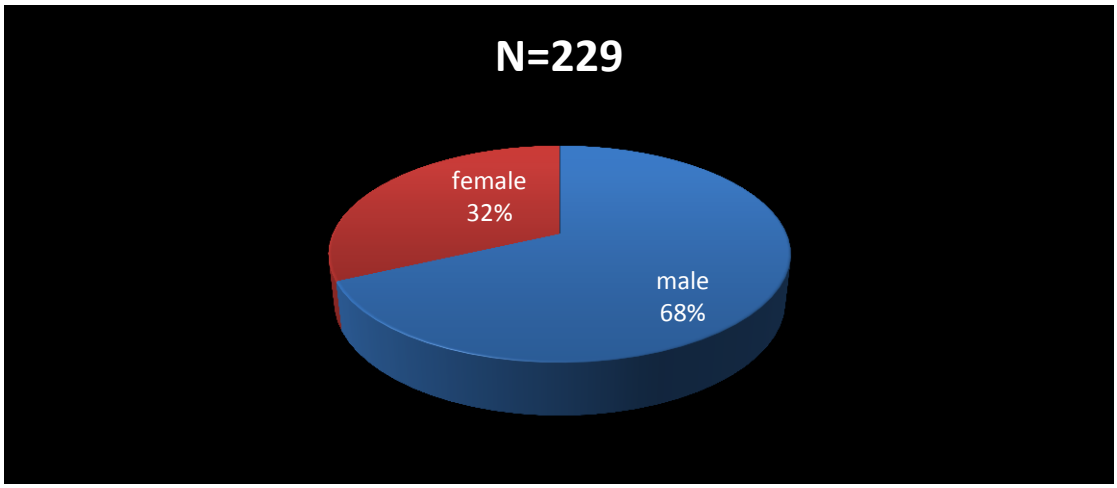

Figure 1 Sex distribution of CHB patients on follow up, TASH Liver clinic, 2021

Table 1. Socio-demographic and clinical characteristics of CHB patients, TASH Liver clinic, 2021

	total n=229	
	Number	Percent (%)
Mean age, years (standard deviation)	39.8(±11)	
Sex		
male	156	68.1
female	73	31.9
Marital status		
single	41	17.9
married	183	79.9
divorced	2	0.9
widow/widower	3	1.3
Level of education		
did not attend school	18	7.9
primary school	46	20.1
high school	57	24.9
diploma/degree and above	108	47.2
Occupation		
unemployed	28	12.2
Government/private employed	125	54.6
self employed	25	10.9
student	13	5.7
housewife	29	12.7
retired	5	2.2
others	4	1.7
Regional state		
Addis Ababa	158	69.0
Oromia	50	21.8
Amhara	6	2.6
SNNP	15	6.6
Treatment status		
not started antiviral	158	69.0
on antiviral	71	31.0
Is there additional infected household member?		
yes	18	7.9
no	211	92.1
Mean disease duration, years (SD)	4.8(±4.2)	
Mean follow up duration at TASH, years (SD)	3.2(±2.7)	

5.2. Knowledge of HBV transmision and prevention

Mean total knowledge score of 14 questions for HBV transmission and prevention was 79.1 (11.14(SD: ±2.6)) showing an high level of hepatitis B knowledge among participants. Nearly 2/3rd of participants (65%) showed high level of knowledge.

90% percent of respondents knows HBV can be transmitted by having unprotected sex with a person infected with hepatitis B; while 28% of them were unware of vertical transmission. Nearly 2/3rd of participants (65%) were aware of four main routes of HBV transmission (i.e. vertical, sexual contact, sharing injecting equipment, sharing toothbrushes or razor blades), only 3 patients were not aware of any transmission routes. The three questions that were least likely to be answered correctly were, about possibilities of transmission by; touching a person with hepatitis B (69%), by kissing a person with hepatitis B (52%) and through the air when a person with hepatitis B coughs or sneezes (67%). Most of participants (96.5%) were aware that people with hepatitis B should tell their family members to get tested. *Table 2* summarized participants' response to knowledge questions.

Table 2 Proportion of CHB patients who answered correctly to questions about knowledge of hepatitis B transmission and prevention, TASH Liver clinic, 2021

knowledge of hepatitis B transmission and prevention (correct answer)	total n=229	
transmission routes	number	percent
By having unprotected sex with a person with hepatitis B (True)	205	89.5
Through mother to child at birth (True)	166	72.5
By sharing toothbrushes or razor blades (True)	198	86.5
By sharing injecting equipments, e.g. needles used in tattooing, body piercing or drug use (True)	190	83
By touching a person with hepatitis B (False)	158	69
By kissing a person with hepatitis B (False)	120	52.4
Through the air when a person with hepatitis B coughs or sneezes (False)	154	67.2
By eating food prepared by a person with hepatitis B (False)	198	86.5
By sharing eating utensils (False)	194	84.7
By sharing foods (False)	204	89.1
prevention knowledge		
People with hepatitis B should use condoms when having sex* (True)	174	76
People with hepatitis B should tell their family members to get tested (True)	221	96.5
There is a vaccination to prevent hepatitis B (True)	183	79.9
Newborn of Hepatitis B infected mothers should receive vaccine at birth (True)	187	81.7

*not applicable if partner is vaccinated or is naturally immune

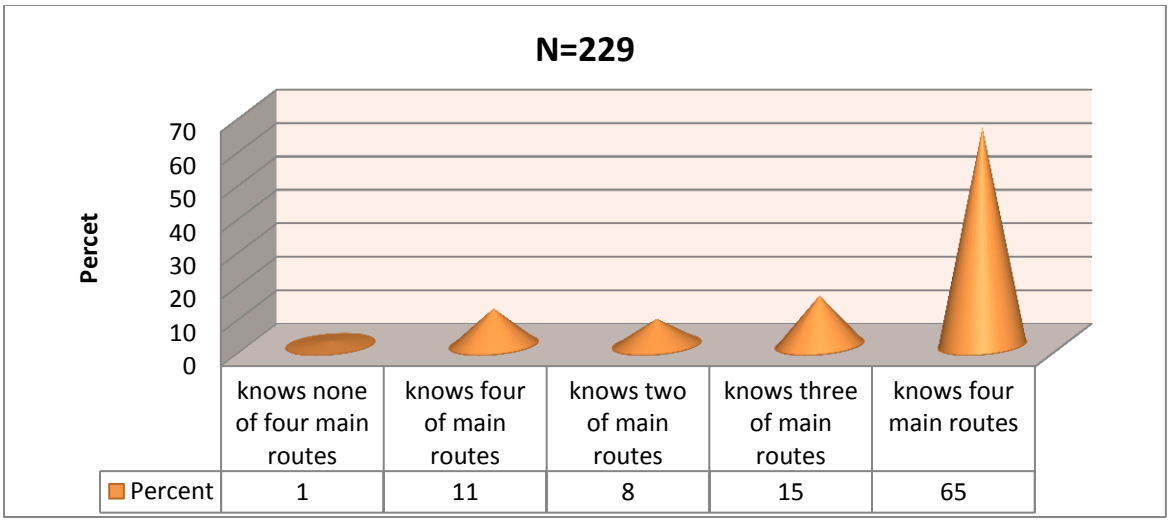

Figure 2 CHB patients knowlege about four main routes of transmission, TASH Liver clinic, 2021

5.3. Practices towards prevention of Household transmission

Mean total total practice score of seven questions to used to assess the practices towards prevention of household transmission was 4.7(SD: 1.79). Since some of questions were not applicable to some patients, only participants for whom all of question assessing practice were included to calculate mean practice score and to categorize practice. The total practice score was dichotomized as good (6-7) or fair to poor(<6). Accordingly, 39 (38.6%) patients were within the good practice range whereas 62 (61.4%) showed fair to poor practice towards HB prevention. When queried about specific preventive practices, most of respondents (87%) answered they have disclosed their status of HBV infection to spouse; about 2/3rd of participants said they encouraged their household members or sexual contacts to get tested; only a half of the respondents said they recommended HBV vaccination to identified unvaccinated household members and/or sexual contacts. Fifty three (26%) of respondents said they always use condom when having sex with unvaccinated/ unimmunized partners. Twenty six (11%) said they had ever shared personal items (razors, toothbrush, and /or nail scissors) with household members while 109(83%) said they always cover their wound. The status of HBV transmission prevention practices reported by respondents are summarized in *Table 3*.

Table 3. HBV transmission prevention practices reported by respondents with CHB infection, TASHLiver clinic, 2021

	number	Percent
disclosed his/her HBV status to spouse [a]		
no	27	12.6
yes	187	87.4
encouraged any of household members to undergo HBV testing [b]		
no	72	32.4
yes	150	67.6
ever recommended HBV testing to sexual contacts [c]		
no	67	30.5
yes	153	69.5
Recommended HBV vaccination to identified unvaccinated household members and/or sexual contacts [d]		
no	95	46.3
yes	110	53.7
Always use condom when having sex * [e]		
no	151	74.0
yes	53	26.0
Ever shared personal items (razors, toothbrush, and /or nail scissors) with household members [f]		
yes	26	11.4
no	203	88.6
Always cover his/her open wounds or cuts [g]		
no	23	17.4
yes	109	82.6

[a] Data available for 214 respondents

[b] Data available for 222 respondents

[c] Data available for 220 respondents

[d] Data available for 205 respondents

[e] Data available for 204 respondents

[f] Data available for 229 respondents

[g] Data available for 132 respondents

*not applicable if partner is vaccinated or is naturally immune

Table 4. Bivariate analysis of the association between mean total knowledge scores and socio-demographic and clinical characteristics of CHB patients, TASH Liver clinic, 2021

variables		number	mean total knowledge	SD	test value	p value
Age group						
	≤40 years	134	11.49	2.283	t=2.331	0.021*
	>40 years	95	10.65	2.938		
sex category						
	male	156	10.99	2.784	t= -1.4	0.162
	female	73	11.47	2.148		
marital status						
	single	41	11.85	2.209	F=1.8	0.154
	married	183	10.99	2.692		
	others	5	10.80	1.095		
level of education						
	low level of education	64	11.20	2.961	t= 0.213	0.831
	high level of education	165	11.12	2.459		
treatment status						
	not started antiviral	158	11.21	2.257	t= 0.49	0.625
	on antiviral	71	11.00	3.256		
other infected household member						
	yes	18	13.39	0.502	t= 3.9	<0.001**
	no	211	10.95	2.620		
duration since diagnosis (years)						
	≤3 years	118	10.80	2.540	t= -2.099	0.037*
	>3 years	111	11.51	2.628		
follow up duration at TASH (years)						
	≤2 years	118	11.15	2.520	t=0.05	0.960
	>2 years	111	11.14	2.698		

*significant different at p≤0.05; **significant different at p≤0.001

Figure 3 Implementation of recommended prevention practices status of CHB patients dichotomized based on top quartile score (≥75/100), TASH Liver clinic, 2021

5.4. Factors associated with knowledge of hepatitis B transmission and prevention

Specific socio-demographic characteristics were associated with hepatitis B knowledge among participants (*Table 4*). Bivariate analyses (independent t-test, chi-square & ANOVA) were conducted to test the associations between socio-demographic data and mean knowledge score of respondents. Three variables; age group, duration since diagnosis and presence or absence of additional infected household members showed significant association with knowledge score. Significant predictors of knowledge were assessed using standard multiple regression.

The three variables that were identified as significant predictors of mean knowledge score (age, duration since diagnosis and other infected household members) were further analyzed by standard multiple regression. The results indicated that younger age group, presence of additional infected household members and longer duration since diagnosis as significant predictors of higher knowledge score (R^2*= 0.106, F=8.936, P<0.001*) as summarized in *Table 5*.

Table 5. Socio-demographic and clinical characteristics associated with high total knowledge of transmission and prevention score (>75%) in people with chronic Hepatitis B, TASH Liver clinic, 2021

Adjusted multiple linear regression

variables	*B*	*t*	*p value*	*R*	*R Square*	*Adjusted R Square*	*F*	*Sig.*
Duration since diagnosis (years)	0.099	2.532	0.027	.320[a]	0.106	0.095	8.936	.000[b]
Age group dichot. (years)	-0.770	-2.293	0.012					
Other infected household member	-2.028	-3.267	0.001					

a. Dependent Variable: total knowledge score

b. Predictors: (any infected household member, duration since diagnosis dichotomized.(years), age group dichotomized.(years)

5.5. Factors associated with associated with prevention practice

Factors associated with practice regarding HBV transmission prevention in the bivariate analyses were assessed using logistic regression (*Table 6*). In Adjusted logistic regression, factors associated with poor practice were; low level of education (OR: 5.218; 95%CI: 1.34-20.23; p=0.017), being on anti HBV treatment (OR: 3.582; 95%CI: 1.04-12.33; p=0.043) and duration of follow up at TASH < 2years (OR: 2.93; 95%CI: 1.14-7.55; p=0.025).

Table 6. Socio-demographic and clinical characteristics of respondents associated with fair to poor practice of transmission prevention among people with CHB, TASH Liver clinic, 2021

	un adjusted binary logistic regression				Adjusted logistic regression			
	Sig.	Exp(B)	95% C.I.for EXP(B)		Sig.	Exp(B)	95% C.I.for EXP(B)	
variables			Lower	Upper			Lower	Upper
level of education								
low level of education	0.015	5.617	1.401	22.509	0.017	5.218	1.346	20.238
high level of education		1.0				1.0		
treatment status								
on antiviral	0.041	3.666	1.055	12.738	0.043	3.582	1.041	12.330
not started antiviral		1.0				1.0		
other infected household member								
yes	0.069	9.045	0.839	97.480				
no		1.0						
follow up duration at TASH (years)								
≤ 2 years	0.009	3.750	1.390	10.117	0.025	2.943	1.146	7.557
>2 years		1.0						

5.6. Correlation between knowledge and prevention practices

Pearson correlation analysis revealed significant linear correlation between knowledge score and total practice score (p=0.01). Linear regression model was also showed significant association; F(1,99)=6.924, p=0.01, R2=0.065.

6. Discussion

Our study identified higher mean total knowledge (11.14 or 79/100) of hepatitis B transmission and prevention among respondents and 2/3rd of respondents have high level of knowledge. The finding was not consistent with other studies, from Australia and Pakistan where low knowledge level were identified. This could be explained by lack access to health care (immigrants) and some difference in data collection tools as well as scoring methods used in these studies.[39] [23] In our study the respondents have better knowledge of transmission routes, as 65% of them know four main routes (i.e. vertical, sexual contact, sharing injecting equipment, sharing toothbrushes or razor blades), while only 35% of respondents were aware of four main routes in Australian study.[39] A community based study that assessed the Hepatitis B Virus (HBV) infection knowledge status of un infected persons across three states in Nigeria identified overall poor knowledge but still higher than the figures reported in both Australian and Pakistan studies.[27] The difference may be related to high prevalence of HIV in sub-Saharan Africa including Ethiopia contributing to better awareness, as most of participants said; "the routes of transmission is the same as that of HIV" in response the questions about routes of transmission.

Despite the context of high mean knowledge score, still significant knowledge gap was seen as more than a quarter of the participants were unware of vertical transmission and also the necessity of new born vaccination against HBV. In addition similar proportion of respondents in this study have a knowledge gap about availability of effective HBV vaccine and condom utilization. The results from other studies showed relatively better knowledge when compared to the finding of our study, suggesting important areas that require attention to halt household transmission HBV.[47] [49]

Misunderstanding about the transmission of hepatitis B through kissing (50%), air (coughing, sneezing), touching infected person and sharing eating utensils was identified among significant proportions of participants and reflects the findings of other studies.[39] [47] [49] The implications of this mistaken information could be significant considering Ethiopian cultures of sharing food, with the likely marginalization of people with CHB leading to unnecessary actions taken by the patients which would disrupt their daily living and affect overall quality of life.

This study also identified that age <40 years, presence of additional infected household members and longer duration since diagnosis of CHB infection (>3 years) predicted higher knowledge of

HB transmission and prevention among participants. In addition to high level of education and English language proficiency, similar findings were reported in other studies as significant predictors of high knowledge in this population.[34 39 47 49 41] This findings indicate a priority for the interventions designed to improve knowledge should be given to older age group, recently diagnosed patients and to those without additional infected household member.

Our study showed the respondents have over all fair to poor practice towards prevention of HBV household transmission based on mean total practice score. The finding is in line with the results of studies done in Pakistan and California.[40 23] In response to specific questions, although most of respondents (87%) said they have disclosed their status to the spouse; around 2/3rd of them encouraged testing while only half of them recommended vaccination to identified unvaccinated household members and/or sexual contacts. The available literature findings are more or less consistent with the current results regarding disclosure. However with regard to the practice of recommending testing and vaccination, a higher practices where seen in a study done in Malaysia and Turkey, while a study done in San Francisco reported lower practice despite higher knowledge among respondents.[34 40 49] This finding highlights high knowledge by itself cannot results in good prevention practices. This could be due to fear of potential social stigma associated with revealing their HBV status even the more knowledgeable cases may have been reluctant to encourage testing and vaccination among their close contacts.[40]

Respondents with low education, <2 years of follow up and those on anti hepatitis B treatment were identified as significant predictors of poor prevention practice among the participants. This association was not analyzed in any of previous studies. We hypothesize that patients on anti hepatitis B treatment may think as if their infection is controlled and no more transmissible to others, thus making them reluctant towards implementation of recommended prevention practices. This finding also suggests a priority groups to be targeted by any interventions designed to improve prevention practice. The positive correlations between knowledge-practice in this study reaffirm the association between knowledge and practice with infection control measures seen in other studies.[23 50]

7. Limitation of the study

The findings of our study are subject to some limitations. It is not possible to exclude the possibility of selection bias based on willingness to be interviewed and with use of convenience sampling method or of response bias based on respondent self-report that could not be verified by any other means. The study was done on outpatients in a single public tertiary hospital that are usually approached by low to middle income population. The high income group usually uses these facilities during emergency only. Besides, the participants were recruited in a clinical settings and the result may over-represent people with CHB who are sufficiently motivated to seek clinical care for their infection. Hence the results of our research may not represent the entire population.

8. Conclusion

This study identified that good overall knowledge of hepatitis B transmission prevention. However misunderstandings about transmission through air, kissing and eating utensils were identified in nearly half of respondents. Furthermore, age >40 years, recently diagnosed patients (<3 years) and those without additional infected household member were identified in this study as priority population for the interventions designed to improve the knowledge gap and correct wrong impressions about transmission. With regards to practice towards prevention of HBV transmission, our study showed that the respondents have overall poor practice. In particular, poor practice was identified in encouraging or recommending testing and/or vaccination to household members and sexual contacts. Lower level of education, follow up duration <2 years and being on anti hepatitis B treatment were identified in this study as significant predictors of poor prevention practices. Higher practice about disclosure of HBV status to spouse identified in this study may be due to response bias. If response bias occurred, it would have biased the results to show better knowledge and preventive practices, so the gaps in knowledge and practice may be even larger than what we found in our study.

9. Recommendation

To clinicians and policy makers

We recommend comprehensive educational interventions using strategies and techniques shown to increase health literacy (by clinicians at outpatient clinics or Mass Medias) are needed to improve knowledge gap and misconception about HBV transmission identified in people with CHB infection. Any educational programs planned for this population should give special attention to implementation of recommended prevention practices than simple awareness creation with priority given to those with low education, <2 years of follow up and those on anti hepatitis B treatment.

To fellow Researchers

Defining the best strategies and methods to deliver education and health promotion messages to this population requires further research. Further studies are also needed to identify awareness and practices of household members of CHB patients as it could contribute a lot to achieve elimination goals launched by World Health Organization.

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ANNEX 1

CONSENT FORM (for patients)

Dear Participant,

My name is Liban Dida. I am a medical doctor who is specializing in Internal Medicine at Addis Ababa University, school of medicine. I am conducting a research project titled: The assessment of knowledge and practice towards household transmission prevention among people with chronic hepatitis B attending liver clinic at Tikur Anbessa Specialized Hospital (TASH), Addis Ababa, Ethiopia. Accordingly I am grateful to inform you that you are selected to be a participant of the study. By participating in the study, you will provide us about 15-20 minutes of your time in answering certain questions related to your disease.

All the information you provide us will be kept confidential. There is no risk associated with the study to you. You have full right to decline involvement in the study or withdraw from the study at any point during the interview. Finally we kindly ask you to give as a genuine response.

Once you decide to involve in the study please put your signature in the space provided below to describe that you willingly decided to participate in the study.

Signature of participant:_____ Date:_____

Signature of the interviewer:_____ Date:_____

Dear data collector if the patient declined to involve in the study, please thank him and proceed to the next participant.

Information to data collector

Dear data collector, the study is aimed to assess the level of knowledge and practice towards household transmission prevention among people with chronic hepatitis B attending liver clinic at TASH, Addis Ababa, Ethiopia.

Please make sure that the data is complete. If you have any questions, you can contact me at the following address:

Mob: +251 953898802 Email: lbndida1@gmail.com

ANNEX 1

QUESTIONEERE

I. Socio-demographic and clinical characteristics of Respondents

1. Age:_____
2. Sex: _____
3. Marital status
   - Married
   - Single
   - Divorced
   - Widow/widower
4. Level of education
   - Not attended
   - Completed primary education
   - Completed secondary education
   - Diploma/degree and Above
5. Occupation
   - Employed (government/private)
   - Unemployed
   - Self employed
   - Student
   - Housewife
   - Retired
6. Region_____
7. Duration since diagnosis of CHB infection:_____
8. Duration of follow up at TASH:_____
9. Treatment status:_____
10. Is there any other person infected with HBV in your household members?
    - Yes
    - No

II. Knowledge of transmission routes and prevention

No.	Answer yes or No about routes of HBV transmission and prevention			
	A. HBV can be transmitted by:	**Yes**	**No**	**I don't know**
1	Having unprotected sex with a person with hepatitis B patients			
2	Through infected mother to child at birth			
3	Sharing toothbrushes or razor blades with hepatitis B patients			
4	Sharing injecting equipments, e.g. needles used in tattooing, body piercing or drug use with hepatitis B patients			
5	Touching a person with hepatitis B			
6	Kissing a person with hepatitis B			
7	Through the air when a person with hepatitis B coughs or sneezes			
8	By eating food prepared by a person with hepatitis B			
9	Sharing eating utensils			
10	Sharing foods			
	B. Answer yes or no about the knowledge to prevent HBV transmission;	**Yes**	**No**	**I don't know**
11	People with hepatitis B should use condoms when having sex if partner is not vaccinated or is not naturally immune			
12	People with hepatitis B should tell their household members/sexual contact to get tested and vaccinated if negative			
13	There is an effective vaccine available to prevent hepatitis B infection			
14	Newborn of Hepatitis B infected mothers should receive vaccine at birth			

III. Practices to prevent household transmission of HBV

No.	specific questions about prevention practices	YES	NO	NA
1	Have you disclosed your HBV status to your spouse/sex partner?			
2	Have you encouraged any of your household members to undergo HBV testing?			
3	Have you recommended HBV testing to any of your sexual contacts?			
4	Have you recommended HBV vaccination to identified unvaccinated household and/or sexual contacts?			
5	Do you always use condom when having sex? (not applicable if partner is vaccinated or is naturally immune)?			
6	Have you ever shared personal items (razors, toothbrush, and /or nail scissors) with your household members?			
7	Do you always cover your open wounds or cuts?			

Annex II: Assurance of principal investigator

Declaration:

I, the undersigned, declare that this is my original work and has not been presented in this or any other University and all sources of materials used for this proposal have been fully acknowledged.

Name: **Dr. Liban Dida Godana**

Signature: _____

Date: _____

Place: Addis Ababa University, College of Health Sciences, School of Medicine, Department of Internal Medicine

Advisor:

Dr Hiwot Belachew (MD, internist, consultant Gastroenterologist and Hepatologist, Assistant professor**)**

Signature: _____

Date: _____

Department of Internal Medicine Head

Dr. Abdurezak Ahmed (MD, internist, consultant Endocrinologist, Associate Professor**)**

Signature: _____

Date: _____