PREVALENCE AND ASSOCIATED FACTORS OF HEPATITIS B VIRUS AMONG VOLUNTEER BLOOD DONORS IN JIMMA ZONE, SOUTHWEST ETHIOPIA

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Jimma, Ethiopia

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Abstract

Background: Hepatitis B virus, a DNA virus of the family Hepadnaviridae is the causative agent of hepatitis B infection and about 50 to 100 times more infectious than HIV. Hepatitis B is a silent killer disease of the liver with many carriers not aware of their clinical status. WHO estimates in 2015 around 3.5% of the populations were living with chronic HBV infection in the world. Globally transfusion of contaminated blood causes up to 16 million new infections with HBV and with each blood unit transfused; there is always a 1% likelihood of transfusion-linked risks including transfusion-transmitted infections.

Objective: The overall objective of this study was to determine the prevalence and associated factors of Hepatitis B Virus among volunteer blood donors in Jimma Zone.

Method: A cross sectional study design was conducted among volunteer blood donors in Jimma Zone who donate blood for Jimma Blood Bank from March 10- April 20/2018. After ensuring the completeness of the questionnaire, the data were checked, data entry and analysis was done by Epi-data version 3.1 and SPSS 20.0 statistical software, respectively. Multivariable logistic regression analyses were used to identify independent risk factors of Hepatitis B virus among blood donors

Result: Among a total of 548 volunteer blood donors participated in the study, Majority of them were found in the age group of 18-24 years 334(60.9%). The overall prevalence of HBsAg among volunteer blood donors participated in this study was 16 (2.9%) with 12(4.5%) were among male and 4(1.4%) in female. Following the multiple logistic regression analysis performed using forward stepwise method male sex {AOR=3.28, 95%CI: 1.01-10.68 (p-0.049)}, Age (groups 18-24) AOR=0.17, 95%CI: 0.36-0.78 (p-0.022) number of donation AOR= 0.25, 95%CI: 0.08-0.76 (p-0.015) and history exposure to unsafe therapeutic drug injection AOR= 6.98, 95%CI: 1.66-29.29 (p-0.008) had remained statistically significant factors for hepatitis B viral infections.

Conclusion: The overall prevalence of HBsAg among volunteer blood donors participated in this study was 16 (2.9%) and first time donation and history of exposure to unsafe therapeutic drug injection were identified to be (high risk) factors independently associated with positive HBsAg status.

Keywords: Hepatitis B virus, prevalence, associated factor, volunteers blood donors

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Abbreviation and Acronyms

CI: ----------Confidence Interval

CHBV---------- Chronic Hepatitis B Virus

DNA: ----------Deoxyribonucleic Acid

ELISA: ----------Enzyme Linked Immune Sorbent Assay

HBsAg: ----------Hepatitis B Surface Antigen

HBV: ----------Hepatitis B virus

HCC: ----------Hepatocellular Carcinoma

MOH: ----------Ministry of Health

PI: ----------Principal Investigator

SOP: ----------Standard Operational Procedure

SPSS: ---------- Statistical Package for Social Science

SSA: ---------- Sub Saharan Africa

TTI: ----------Transfusion Transmittable Infections

US: ----------United state

WHO: ---------- World Health Organization

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CHAPTER ONE

INTRODUCTION

1.1 Background

The term "hepatitis" is used to describe a common form of liver injury. Hepatitis simply means "inflammation of the liver" (the suffix "itis" means inflammation and "hepa" means liver). Viral hepatitis is an inflammation of the liver due to viral infections of hepatitis families and there are seven genotypes (A to G) of hepatitis viruses that affect the liver. It is most often caused by viruses that are hepato-tropic (hepatitis A, B, C, D, and E). Other viral infection may also occasionally affect the liver. Whereas hepatitis A and E are self-limiting, infection with hepatitis C and to a lesser extent hepatitis B usually becomes chronic.(1)

Hepatitis B virus (HBV), a DNA virus of the family *Hepadnaviridae* is the causative agent of hepatitis B infection. Hepatitis B is one of the most common infectious diseases in the world and a major health problem (2). It is about 50 to 100 times more infectious than HIV and 10 times more infectious than hepatitis C virus with many carriers not realizing they are infected with the virus. It is an important cause of liver diseases such that, chronic infection with HBV is a common cause of death associated with liver failure, cirrhosis and liver cancer (3). Hepatitis B is a silent killer disease of the liver with many carriers not aware of their clinical status therefore they act as potential source of infection to other seronegative people. (4)

Humans are the only known host for HBV, although some non-human primates have been infected in laboratory. HBV is stable and resistant at both humid and extreme temperatures but the virus is effectively destroyed by autoclaving at 121^{o}C for 20 minutes. The virus relatively resilient and in some instances, has been shown to remain infectious on environmental surfaces for more than 7 days at room temperature. (5)

The presence of HBsAg in the blood indicates that an individual is currently infected with the virus. Individuals who recover from acute hepatitis B infections clear the blood of HBsAg within approximately four months after the onset of symptoms. These individuals develop antibodies to HBsAg (anti-HBs) that provides complete immunity to subsequent hepatitis B viral infection. Similarly, individuals who are successfully vaccinated against hepatitis produce anti-HBs in the blood. (6)

The risk of developing chronic Hepatitis B (CHB) virus infection commonly defined as being positive for hepatitis B surface antigenaemia (presence of HBsAg in blood) for greater than 6 months and is inversely related to the age of acquisition of the infection. Generally the risk of chronic HBV infection is 90% following infants infected at birth while the risk is put at 30% for children infected between 1 and 5 years of age, and only about 1–5% for those infected as older children and adults. Worldwide, the majority of persons with CHB were infected at birth or in early childhood. (7)

Depending on the epidemiological pattern within a geographic area, the main routes of transmission are by percutaneous or mucosal exposure to infected blood and various body fluids, as well as through saliva, tears, menstrual, vaginal, and seminal fluids. Transmission of the virus may also occur through the reuse of needles and syringes either in health-care settings or among persons who inject drugs. In addition, infection can occur during medical, surgical and dental procedures, through tattooing, or through the use of razors and similar objects that are contaminated with infected blood. (8)

Worldwide, it is estimated that 240 million people are chronically infected with hepatitis B virus (9). The largest number of people living with chronic HBV live in the Western Pacific region (over 95 million) followed by the African region (over 75 million) (10). Recent reports demonstrated that 68,600 people die of HBV infection and more than 300,000 deaths due to liver cancer secondary to hepatitis B every year globally.(11) Prenatal and early childhood transmissions are the main routes of HBV infection in high and intermediate endemic areas(12). Administering HBV vaccination to 90% of newborns within 24 hours from birth would prevent 84% of global HBV-related deaths.(13)

HBV infection prevalence varies markedly in different geographic areas of the world, as well as in different population sub groups. It ranges over 10% in some Asian, Western Pacific and sub-Sahara African countries to under 0.5% in the US and northern European countries (14). Regions like South East Asia and SSA are high endemic areas for HBV .Ethiopia, being part of this region, is ranked as an area with medium to high endemicity for HBV. (15, 16)

In general, the prevalence of chronic HBV infection worldwide could be categorized as high if it is higher than 8%, intermediate if it is between 2% and 7% and low endemicity if it is below 2% (17). Overall, approximately 45% of the global populations live in areas of high chronic HBV prevalence (18).The prevalence of HBV is estimated at 8% in West Africa and 5-7% in Central, Eastern and Southern Africa. (8)

According to WHO reports, the prevalence of HBV infections among blood donors in different parts of the world varies from 0.008% to 6.08% (19). In voluntary, non-remunerated blood donors recruited with effective education and selection programs, the prevalence and incidence of HBV infection should be lower than in the general population. Despite a lower prevalence and incidence, screening of blood donors may lead to tests that are positive for HBV infection.(20, 21)

Globally, an estimated 1.6 million blood units are discarded annually due to the presence of markers for transfusion-transmitted infections, including HIV, HBV, HCV and syphilis (22). However, donors with reactive tests are not always managed appropriately. Following confirmatory tests, they should either be returned to the pool of blood donors (if not infected) or be further assessed for treatment (if infected). (20)

In sub-Saharan Africa and other resource-limited settings, transfusion-transmitted HBV infections remain a public health burden. From 2000 to 2011, the number of countries in sub-Saharan Africa screening at least 95% of donated blood units for HBV increased from 76% to 94%, during the same period, the median percentage of HBV marker-reactive units decreased from 7.1% to 4.4%. (23)

In Ethiopia it was estimated that, over 5 million people are living with chronic HBV infection among the general population. (6) Several programs have been implanted in Ethiopia to reduce the burden of HBV in the community. These programs includes: the Expanded Program on Immunization Policy, updated in 2007 and including childhood immunization against HBV using a pentavalent form at ages 6, 10 and 14 weeks after birth; implementing antenatal screening for HBsAg of all pregnant women and the vaccination of their babies at birth; and recommending the vaccination of high risk groups such as health professionals against HBV. However, these programs have not been routinely enforced in most healthcare settings across the country. (24)

Quality-guaranteed screening of all donated blood for TTIs, including HIV, HBV, and HCV, is recommended by the WHO and adopted by the Ethiopian government for the provision of safe and efficacious blood and blood components (25). This includes the selection of eligible blood donors, the collection of blood, the processing and testing of the donated blood, the issuing of compatible blood, and safe administration of the blood to recipients. In response to this strategy, Ethiopia take responsibilities for blood transfusion from the Ethiopian Red Cross Society and granted it to the national blood transfusion service Agency, a government

agency managed under the Federal Ministry of Health and Regional Health bureau created in 2010 to ensure blood safety and accessibility.(26) Though few studies were conducted in Ethiopia on the blood donors Marker-reactive rates in 2000/2004 from 24,000 donors was 4% Hepatitis B and 2010/2011 from 92,218 donors was 3.42% Hepatitis B and 2000/2004 to 2010/2011 ratio was 0.86% Hepatitis B. (23)

A cross-sectional retrospective record review conducted in Jimma Blood bank center from 2010 to 2015 shows the prevalence of HBV 3.05%. (27)

1.2 Statement of the problem

Hepatitis B virus (HBV) infection is one of the major diseases of mankind that has shown to cause serious public health problem.(28) WHO estimates in 2015 around 3.5% of the populations were living with chronic HBV infection in the world. The African and Western Pacific regions accounted for 68% of those infected. HBV infection is estimated to be the cause of 30% of cirrhosis and 53% of liver cancer worldwide. (21)

Most of the deaths (94%) were attributed to complications of chronic infection, such as cirrhosis and Hepatocellular carcinoma (HCC), and only 6% were attributed directly to acute hepatitis B (13). HCC is the sixth most common cancer and the third most common cause of cancer death in the world (29). Chronic HBV infection is the most common cause of HCC, accounting for 50% of HCC cases worldwide and up to 80% of cases in high HBV endemic regions. (30)

Globally, millions of people are living with viral hepatitis and millions more are at risk. This is because of most people who were infected long ago with HBV are unaware of their chronic infection. They are at high risk of developing severe chronic liver disease and can unknowingly transmit the infection to other people (8) through exposure to infected blood via blood transfusion or unsafe injection practices, and transmission from mother to child during pregnancy and delivery.(32)

Screening of donated blood for transfusion-transmissible infections represents one of the most important strategies for blood transfusion safety and availability, and the presence of this type of infection among blood donors is a rare event. Globally, transfusion of contaminated blood causes up to 16 million new infections with HBV. With each blood unit transfused, there is always a 1% likelihood of transfusion-linked risks including transfusion-transmitted infections. Prevention of transfusion transmitted infections (TTIs) in developed countries has been achieved by reducing unnecessary transfusions, using only regular voluntary donors, excluding donors with specific risk factors and systematic screening of all donated blood for infection. By contrast, in many developing countries none of these interventions is applied uniformly and the risks of transfusion-transmitted infections remain high. (34, 35)

In Sub-Saharan Africa 12.5% of patients who received blood transfusion are at risk of post transfusion hepatitis.(36) It is estimated that more than 45,000 HBV infections are transmit

through contaminated transfusions annually. Due to those risks evaluation and monitoring the prevalence of transfusion transmissible viral infections in blood donors is a valuable index of donor selection and blood safety.(23, 37)

Standard blood transfusion guidelines and protocols, including stringent donor screening, effective identification of blood-borne pathogens before donation, and proper counseling and treatment of positive cases, need to be implemented in the blood transfusion work process.(34)

There were different studies in Ethiopia on the prevalence of HBV among blood donors showing the result ranges 2.1%-25% (39-41). A cross sectional study results at Bahir Dar referral hospital reported that prevalence of HBV among blood donors was 4.1%. (42) And another study at Hawasa Blood Bank on blood donors shows HBV prevalence of 4.2%.(43) and a cross-sectional retrospective record review conducted studies at Dire Dawa Blood Bank from 2009 to 2014 and Jimma Blood bank from 2010 to 2015 shows the prevalence of HBV 3.73% and 3.05% respectively.(27, 44)

Although previous studies have described prevalence of HBV infection among blood donors in Ethiopia, but almost all studies conducted among all types of donors including Family replacement blood donors and Commercial blood donor in which the probability of transfusion transmissible infection including HBV is high prevalence due to absence of exposure screening before blood donation.

Also only few studies identified risk factors of hepatitis B Virus among volunteer blood donors especially in study area. Therefore, this study was aimed to determine the prevalence of HBV and associated factors among volunteer blood donors in Jimma zone.

1.3 Significance of the study

Viral hepatitis is key public health problems that pose an enormous risk for disease transmission in the general population including blood donors. Reliable epidemiological data are essential for planning health programs and facilitating the scaling up of hepatitis treatment as well to identify highly risk groups especially in blood donor recruitment process.

Hence this study will be try to fill gap of information on the prevalence and risk factors of hepatitis B virus infection among blood donors specifically in study area and contributes as an input for prevention and control of the hepatitis B virus infection and to assure blood safety in achieving the national blood transfusion services strategies for further improving blood donor selection protocol according to the geographic area and population subgroup if necessary, so that based on research findings to recommend remedy action for further planning to improve blood service delivery and recommend possible interventions to save lives risked due to unsafe transfusions. In addition, the finding of this study will be used as a baseline data for further studies.

CHAPTER TWO

LITERATURE REVIEW

2.1 Prevalence of HBV infection

The prevalence of HBV and its modes of transmission vary with geographically, and it can be classified into three endemic patterns. Countries can be divided by their level of endemicity, which is based on the percentage of the general population that is seropositive for HBsAg (chronic carriers). Around 45% of the world's population lives in regions of high endemicity, defined as areas where 8% or more of the population are positive for HBsAg such as Southeast Asia and SSA. The moderately endemic areas, such as Mediterranean countries and Japan, are defined as those areas where 2-7% of the populations are HBsAg positive, and around 43% of the world's population lives in regions of moderate endemicity. Western Europe and North America are considered as areas with low endemicity (2% of the populations are HBsAg positive) and it constitutes 12% of the world's population.(28)

In 2015, the global prevalence of HBV infection in the general population was 3.5%. Among those born before the hepatitis B vaccine became available, the proportion of persons living with chronic HBV infection remains high. Prevalence was the highest in the African (6.1%) and Western Pacific regions (6.2%).(21)

Across sectional Study conducted on the prevalence of HBV infection among blood donors in the northern part of Karnataka in India , a total of 720 volunteer blood donors samples out of which 14 (1.94%) samples were positive for HBsAg.(45) Similarly study from Jordan by Al-Ganiet show that from 24173 blood donors, 370 were found to be positive for HBsAg, giving an overall prevalence of HBsAg of 1.4%.(46)

Study by Nawfal Rasheed Hussein and his colleagues on the prevalence of hepatitis B and C viruses among blood donors in Iraq found that 62 (0.78%) donors showed positive HBsAg results(47).On the other hand study conducted by A.A. Al-Waleedi and Y.S. Khader Prevalence of hepatitis B and C infections and associated factors among blood donors in Aden city, out of 290 volunteer blood donors 10 (3.4%) were positive for HBsAg.(48)

Beside different study from parts of the world, there also different studies were done in Africa. A cross-sectional study was conducted on Prevalence of HBV infection among blood donors in Cameroon shows overall prevalence of HBV infection was 11.2%.(49) On the other hand similar cross sectional study conducted on Prevalence of transfusion -transmissible

hepatitis B infection among blood donors in Nigeria indicates the prevalence of hepatitis B infection among 150 consecutively- recruited blood donors tested, 14(9.3%) were positive for overall TTIs and the prevalence of HBV was 3.3%.(50)

The study conducted on the Seroprevalence of HBV and Hepatitis C virus among blood donors in Darfur Sudan a total of 400 male blood donors were tested for the detection of HBsAg, (6.25%) were found reactive for HBsAg and the result clearly state associated factor and the highest percentage (30.8%) of HBV reacted samples were aged within the age group 19-24 and 37-42 for each.(51)

Concerning HBV, different studies were done in Ethiopia in different parts of the countries at different time. A national wide study conducted on Sero-epidemiology of hepatitis B and C virus infections among blood donors in Ethiopia shows that the overall HBV prevalence of 3.9%. When we compare each region, HBV prevalence was relatively high in Adama (5.91%) followed by Gondar (4.05%), Jimma (3.87%), Addis Ababa (3.75%) and Tigray (3.7%)(52). Other systematic review and meta-analysis conducted for five decades (1968–2015) from different published studies in 2016 showed a pooled HBV prevalence of overall blood donors in Ethiopia was 8.4%.(55)

Another study conducted on HBV & HCV viral infections among blood donors in Bahir Dar, the sero prevalence rate of HBV infection was 4.11%.(53) and similar study conducted in southern Ethiopia on transfusion transmissible infections among voluntary blood donors at Wolaita Sodo University teaching referral hospital the prevalence of HBV was 9.6%.(54)

A cross sectional study conducted in Hawasa Blood Bank among 384 blood donors, 16(4.2%) were positive for HBV (43). Similar study conducted on prevalence and associated factors of Hepatitis Band Hepatitis C virus among volunteer blood donors in Arba Minch Blood Bank shows the prevalence of HBV among Volunteer blood donors was 4.7%.(56)

A retrospective study conducted on transfusion-transmissible infection surveillance among blood donors in Southwest Ethiopia, Jimma Blood Bank, from the total of 10 733 individuals who donated blood in Jimma blood bank between 2010 and 2015 the seroprevalence of HBV was 3.05% including all three type of blood donors, Over the six-years period, the prevalence rates of HBV showed significant declining from 3.95% in 2010 to 2.05% in 2015.(27)

2.2 Associated factors of HBV

Study conducted on the prevalence of HBV infection among blood donors in the northern part of Karnataka in India shows a higher seroprevalence rate of HBV was observed among male donors than in female blood donors. The majority of the seropositive donors were younger than 35 years of age.(45)

Another study conducted by A.A. Al-Waleedi and Y.S. Khader in Yemen on Prevalence of hepatitis B and C infections and associated factors among blood donors in Aden city shows history of blood transfusion and dental treatment was significantly associated with increased prevalence HBV infection.(48)

Also study conducted in Nigeria indicates Hepatitis B prevalence was significantly higher among civil servants and farmers and lowest among traders and students. Hepatitis B infection was significantly higher among younger donors in the 18-28 years age group compared to in the 29-38 and 39-48 years age groups and Married donors was significantly as risk for HBV compared to single blood donors.(50)

Beside those study on Sero prevalence of Hepatitis B virus and Hepatitis C virus among blood donors from Dar fur, Sudan show that different factors associated with HBV and their study result indicates those parenteral drug injections was (10%), razor sharing (13.3%), tattooing and surgical procedures were (3.3%).(51)

In Ethiopia there were different study conducted on the prevalence of HBV among blood donors. A study conducted on HBV & HCV viral infections among blood donors in Bahir Dar, found that 95 (4.4%) out of 2177 males and three (1.5%) of the 207 females were having HBV infections .In case of occupation of the blood donors the higher seroprevalence of HBV was observed in day laborers 62(4.6%) followed by farmers 28(3.8%), and students 4(3.1%).(53)

In a similar study to determine seroprevalence of HIV, HBV, HCV and syphilis infections among blood donors at Gondar University Teaching Hospital of Northwest Ethiopia in 2010, significantly increased HBV sero-positivity was observed among first time donors, in age groups 26 – 45 years (40)

2.3 Conceptual frame work

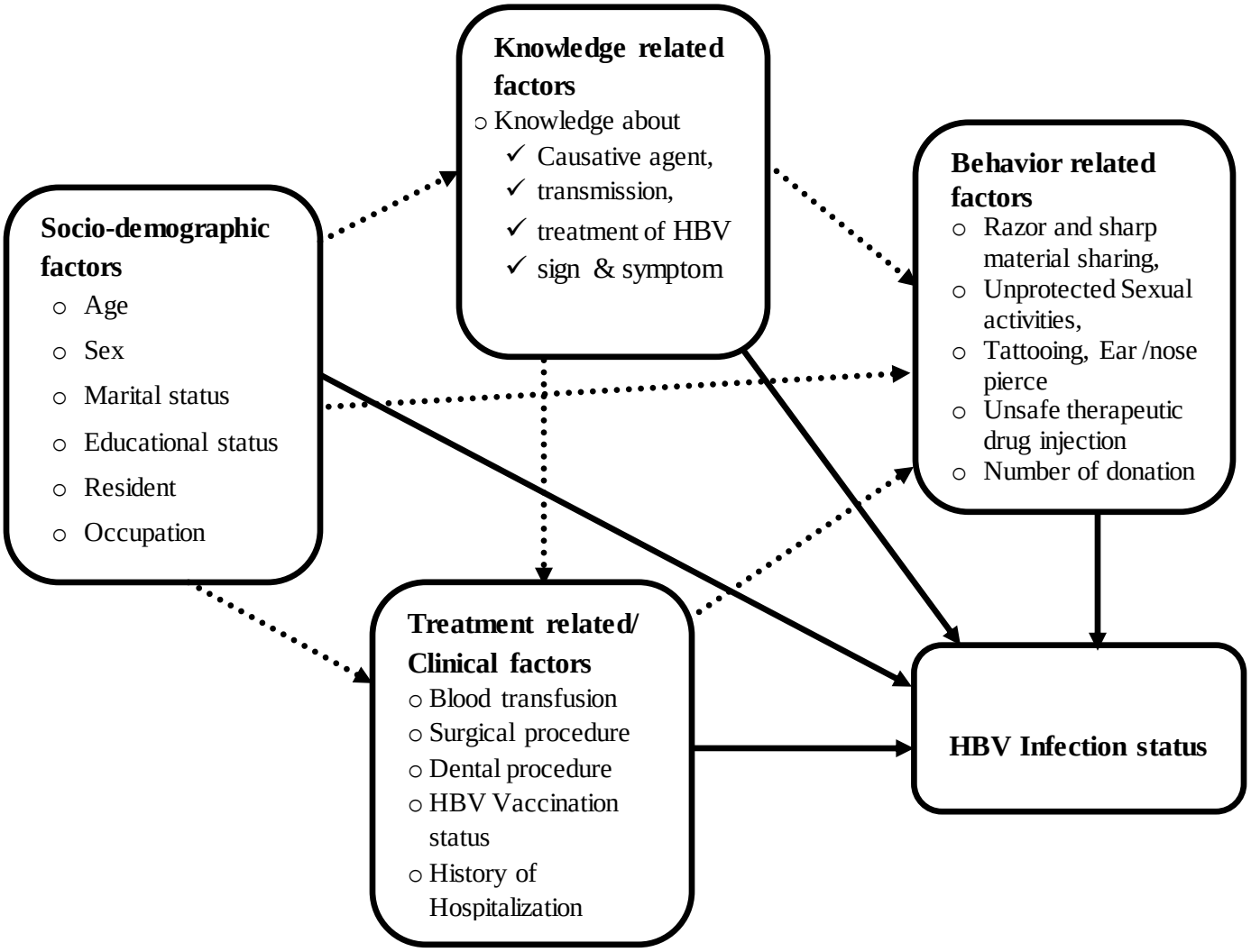

Figure1. Conceptual framework shows factors related with HBV infection adopted from different literature.

CHAPTER THREE

OBJECTIVES

3.1 General Objective

- ✓ To determine the prevalence and associated factors of HBV among volunteer blood donors in Jimma Zone, South West Ethiopia, 2018.

3.2 Specific objectives

- ✓ To determine the prevalence of HBV among volunteer blood donors in Jimma Zone.
- ✓ To identify risk factors associated with HBV among volunteer blood donors in Jimma Zone

CHATER FOUR

METHOD AND MATERIALS

4.1 Study area and study Period

The study was conducted in the Jimma zone, which is located in Southwest part of Ethiopia, Oromia regional state and 354 km away from Addis Ababa. According to the data from the Jimma zone statistical department in 2016/17, the total populations were estimated 3,174,484. It has 21 woreda (district) 513 rural kebeles and 42 urban and semi urban with total of 555 kebeles.

The Jimma blood bank is found in Jimma town. It is one of the senior blood bank in Ethiopia which established under Ethiopian Red Cross Society Jimma branch in 1984 and Since September 2014, it has been collecting blood from only volunteer non remunerable blood donors (VNRBD) and currently Serving ten (10) hospitals in the catchment seven hospitals from Jimma zone and three hospitals from South Nation Nationalities People Region. On average the blood bank collects blood twenty, five hundred, six thousand per day, per month, per years respectively in 2016. It collects blood within 100 km square area and collection site include Mizan, Bonga, Saja and Tercha town outside Jimma zone from South Nation Nationalities People Region.

The study was conducted from March 10 to April 20/2018

4.2 Study design

A cross sectional study design was conducted among volunteer blood donors in Jimma Zone

4.3 Population

4.3.1 Source population

All volunteer blood donors in Jimma Zone

4.3.2 Study population

All volunteer blood donors in Jimma zone who were visited blood bank and blood collection sites for donating blood during study period

4.4 Inclusion criteria

4.4.1 Inclusion criteria

All volunteer blood donors in Jimma zone or lives in Jimma zone at least for six months and who were qualified for blood donation according national blood bank guidelines for blood donation eligibility criteria which includes:-

- ✓ Age: 18-65 years old, Weight: 45 kg and above
- ✓ The interval between blood donations should not less than 3 months.
- ✓ Hemoglobin normal range :-**for male** >= 13.5 mg/dl **for Female**>=12mg/dl
- ✓ Normal blood pressure systolic/diastolic 100/70 up to 150/90
- ✓ No previous history of hepatitis, not having venereal diseases, bleeding tendency
- ✓ Chronic skin disease, heart disease, kidney disease, diabetes mellitus
- ✓ Not in a condition of acute weight loss up to 10% within last six month
- ✓ Not be a homosexual
- ✓ No history of drug addiction by injection
- ✓ Not less than 6 months after operation or delivery (termination of pregnancy)
- ✓ Not be pregnant or lactating women etc

4.5 Sample size determination

The sample size determination for this study was determine based on single population proportion formula by taking the prevalence of HBV among blood donors in the southwest Ethiopia 3.05%(27), 1.5% margin of error and 95% confidence interval (CI). So after calculation the final sample size was **555**.

$$N = \frac{Z_{\frac{\alpha}{2}}^2 p.(1-p)}{d^2}$$

$$\frac{3.8416 * 0.0305\,(1-0.0305)}{(1.5\%)^2}$$

$$\frac{3.8416 * 0.0295675}{0.000225}$$

N = 505

By assuming 10% non- response rate, the final sample size was calculated as:

$$NF = \frac{N*10}{100} + N$$

NF = **555**

Where **N=** required sample size

Zα/2=critical value for normal distribution at 95% confidence interval

Which equals to 1.96 (Z value at α=0.05).

P= proportion of prevalence Hepatitis B Virus among blood donor (27)

$\mathbf{d^2}$ =marginal error 1.5%

NF= final sample size

4.6 sampling technique and Sampling procedure

All volunteer blood donors were selected consecutively from collection site in Jimma zone and in blood bank centers during study period until the required sample obtained.

Sampling procedure follows the movement plans of blood bank service due to the data collectors assign to each team of blood bank staff. According to daily plan of blood bank service, the numbers of volunteers in each planned collection sites usually unknown and three functional teams established to collect blood from volunteer blood donors. Each team planned to collect 250 blood units from ten days in blood bank center and fifteen days outreach and so that the sample size was equally distributed for case teams.

After mobilization of different parts of community (secondary school students, university community, religious organization, youth center) prior to blood collection, the data collectors being with case teams of blood bank staffs move for blood collection from planned collection sites.

4.7 Variables

4.7.1 Dependent variable

- HBV infection status

4.7.2 Independent variables

Socio-demographic factors

- Age
- Sex
- Marital status
- Educational status
- Residency
- Occupation

Behavior related factors

- Razor and sharp material sharing
- Unprotected multiple Sexual activities
- Tattooing, Ear/Nose pierce

- Using unsafe therapeutic drug injection
- Number of blood donation

Knowledge related factors

Knowledge about

- Causative agent of HBV
- Means of transmission of HBV
- Sign and symptoms of HBV
- Treatment of HBV

Treatment related/ Clinical factors

- Blood transfusion
- Surgical procedure
- Dental procedure
- HB Vaccination status
- previous history of hospitalization

4.8 Operational definition and definition of terms

Knowledgeable: - in this study knowledge about HBV prevention and control was measured using 18 questions with the most appropriate response for each question based on the current literature. Each correct answer score 1,and wrong answer or " I don't know " scored 0 thus the knowledge score was scaled from 0 to 18 a person scoring a total of 9 or less was taken as having poor knowledge and those scoring 10 and above had good knowledge regarding HBV(57)

Tattooing: - Presence of an image made on any part of the donor's body by needles

Vaccination status: - *Vaccinated:* Individuals who had received three doses of HBV

*Partially vaccinated**:*** Individuals who received one or two doses of HBV vaccine and

Non-vaccinated: Individuals whose had not been vaccinated against hepatitis B virus

Donor population**:** - all individuals who fulfill the eligibility criteria of blood donation.

Volunteer Blood Donor: People who give blood without any payment and any enforcement

First time blood donors: - Individuals who donate blood for the first time in their life

***HBV infection* status -** Individuals whose tested results positive or Negatives for HBsAg by ELISA test

Hepatitis B surface antigen (HBsAg):- the outer envelope surface protein of HBV. Testing positive for this protein shows that individuals is newly infected or is a carrier.

4.9 Data collection method

4.9.1 Data collection tool

Structured questionnaire was used to collect data from blood donors. It was prepared in English and translated into local language for field work purpose and data on biological sample or dependant variable collected by work sheet prepared for result record

4.9.2 Data collection procedures

Data on independent variables was collected by structured questionnaire and it was numbered to identify those who had respond and or not. After donors agree to take part in the study, he or she sign consent form and baseline information of each participant was collected and the blood sample was taken from donated blood to sterile test tubes which further used for the Screening. Then the collected blood was centrifuged and plasma separated and stored at 2 to 8°C until it was tested. Samples were brought to room temperature prior to testing.

So there is no additional blood needed form donors due to blood bank tests all collected blood for different TTIs and the test of HBV for each study subject was performed by senior laboratory technologist in blood bank who was participate in data collection

4.9.2 Laboratory testing

The plasma sample was analyzed for HBsAg using 4^{th} generation ELISA test kit by senior laboratory professional and principal investigator.

4.10 Data Quality Management

Questionnaire prepared in English were translated into local language for field work purpose and back to English for checking language consistency. Before the actual data collection, the questionnaires were pre-tested in similar study area in Ilubabor zone to ensure the respondents able to understand the questions and to check the wording, logic and skip order of the questions in sensible way to respondents as well as the time needed for data collection.

All data collectors were selected based on ability to speak the local language and two days orientation was given by the investigators on how they will collect the data from study participants. The whole data collections were supervised by principal investigator.

Every questionnaire was crosschecked daily for completeness and consistency and ELISA kits were checked for appropriate storage conditions and its expiry date. Internal positive and

negative controls were included in each assay run and Standard operation procedures (SOPs) and manufacturer instructions were strictly followed.

4.11 Data analysis

All data collection forms were examined for completeness, consistency and clarity during data management, storage, and analysis. The data was coded, entered, and cleaned before analysis. The descriptive analysis was used to describe all blood donor categories with regard to independent variables (age, sex, residence, occupational and educational status, knowledge about HBV and number donation). Bivariate analysis was used to determine crude estimates of factors associated with HBV infection.

Finally all variables at $P<0.25$ in the bivariate analysis were entered into the multivariable model to identify the significant independent determinants of HBV infection. All variables which had significant association with p-value less than 0.05 in the multivariable model were considered to be independent factors. All data entry and analysis were done by Epi-data version 3.1 and SPSS 20.0 statistical software respectively.

4.12 Ethical approval

Ethical approvals for the study were obtained from the Institutional review board (IRB) of Jimma University, department of Epidemiology. In addition permission letter was also obtained from Jimma Blood Bank service center.

Written informed consent, risk and benefit of the study was informed for each blood donor, when blood donors were ready to participate in the study. To prevent the risk of back retrieval of confidential information like names of the blood donors, during data collection assigned code numbers was given by the investigators.

All blood donors who were positive for HBsAg during study period were counseled by councilor Nurses assigned for such purpose in Blood Bank and linked to Jimma University medical center to get necessary treatments and follow up. The participants were had the right to discontinue the participation at any time.

4.13 Result dissemination plan

Final report will be submitted to Jimma University, department of Epidemiology and the finding of this study will have been communicated to Jimma Blood Bank, Jimma Zonal Health Office and for other concerned bodies including the study community. This can be accomplished through presenting the findings at the appropriate meetings, seminars, and workshops. In addition possible efforts will be made to present the findings in different professional meetings/ conferences and the manuscript will be sent for publication.

CHAPTER FIVE

RESULT

5.1 Socio-demographic characteristics of the study participants

A total of 548 volunteer blood donors with 98.7% of response rate were participated in the study. The age of respondent ranges from 18 to 51years old with the mean age of 24.84 years and Standard Deviation (SD) of ±5.85 years and majority of them 334(60.9%) were found in the age group of 18-24 years.

Concerning their marital status, majority of participants 319(58.2%) were single, with respect to occupational status the majority of participants 330(60.2%) were students and 444(81.0%) were urban residents (Table1).

Table1. Socio-demographic characteristics of Respondents in Jimma Zone, South West Ethiopia, March 10 –April 20/2018 (n =548)

Characteristics	Category	Frequency	Present (%)
Age (Year)	18- 24	334	60.9
	25- 34	174	31.8
	≥35	40	7.3
Sex	Male	268	48.9
	Female	280	51.1
Marital Status	Single	319	58.2
	Married	211	38.5
	Separated *	18	3.3
Residence	Urban	444	81.0
	Rural	104	19.0
Educational Level	Illiterate	0	0
	Elementary	16	2.9
	Secondary	162	29.6
	College Diploma	159	29.0
	Degree and above	211	38.5
Occupation	Employed	130	23.7
	Self employed *	67	12.2
	Daily laborer/ jobless	21	3.8
	Student	330	60.2

*separated –divorced or widowed, *self employed – house wife or farmer or merchant

5.2 Knowledge of the respondents regarding HBV

Concerning knowledge of study participants 443 (80.8%) of the respondents were having the good knowledge on HB (Fig. 2).

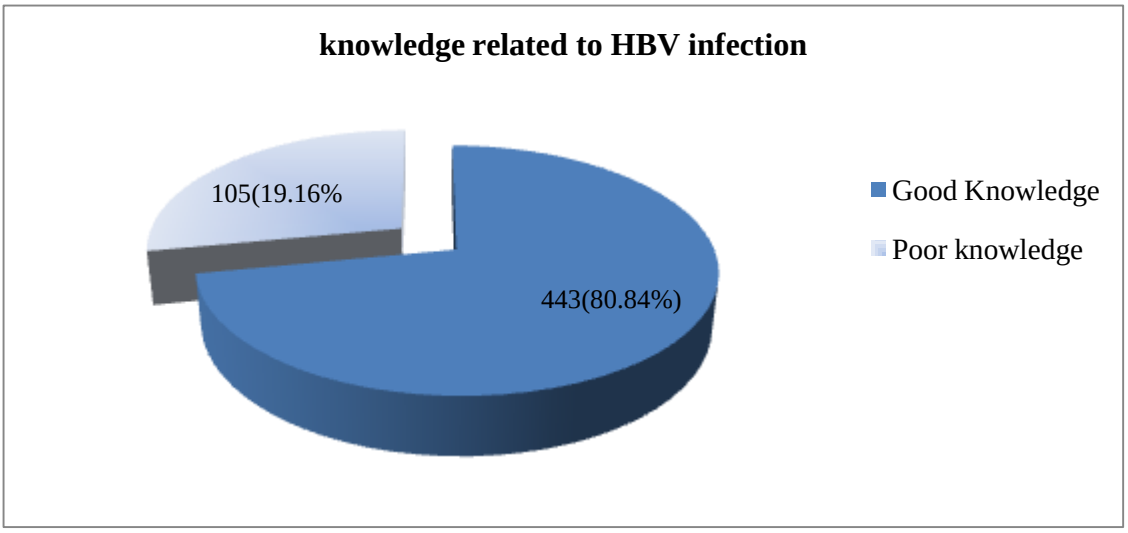

Figure 2: Proportion of knowledge hepatitis B of study participants in Jimma Zone, South West Ethiopia, from March 10- April 20/ 2018

Regarding general awareness about hepatitis, 520(94.9%) and 408(74.5%) of the participants ever heard about liver disease and HBV respectively. while, 377(68.8%) and 422(77.0%) of them knew that HB is a viral disease and it can cause liver cancer. Majority of participants had get information from health professionals 248(45.3%). (Table 2)

Table 2: Hepatitis B knowledge related item responses of study in Jimma Zone, South West Ethiopia, from March 10- April 20/2018

Knowledge items	Category	Yes Number (%)	No/I don't know Number (%)
General awareness	Ever heard about liver disease	520(94.9)	28(5.1)
	Ever heard about HB	408(74.5)	140(25.5)
	HB is viral disease	377(68.8)	171(31.2)
	HB can cause liver cancer	422(77.0)	126(33.0)
	HB can affect any age group	457(83.4)	91(16.6)
	Hepatitis B transmitted disease	430(78.5)	118(21.5)
	Unsafe sex	437(79.7)	111(20.3)
	Un-sterilized syringes and surgical instruments	432(78.8)	116(21.2)

Mode of transmission	Tattooing and ear / nose piercing instrument	441(80.5)	107(19.5)
	Mother to child	434(79.2)	114(20.8)
	Contaminated Blood and blood products	462(84.3)	86(15.7)
	Contaminated Food and drink	135(24.6)	413(75.4)
Sign and symptoms	Fever, running nose, and cough)	422(77.0)	126(23)
	Jaundice	445(81.2)	103(18.8)
	No symptom in some people	376(68.6)	172(31.4)
Treatment	Hepatitis B curable/treatable	429(78.3)	119(21.7)
	Hepatitis B self curable by body	470(85.8)	78(14.2)
	Availability of Vaccine for Hepatitis B	449(81.9)	99(18.1)

5.3 Distribution of HBsAg positivity by socio-demographic variables

The detection of HBV was made through investigation of HBsAg in the serum. The overall prevalence of HBsAg among volunteer blood donors participated in this study was 16 (2.9%) and the Sero-positivity was higher in male participants 12(4.5%)

Concerning age groups HBsAg was higher among age groups ≥35years old 3(7.5%). With respect to marital status, the highest prevalence of HBsAg was found among separated 1(5.6 %) followed by married participants 7(3.3%). The prevalence of HBsAg was higher among urban residents than rural residents, which was 14(3.2%) in urban and 2(1.9%) live in rural respectively

The highest occupation specific prevalence of HBsAg was observed among the daily laborer and employed, 1(4.8%) and 6(4.6%) respectively and lowest prevalence was among students 7(2.1%). Based on the bivariate finding age and sex status were candidate variables for Multivariable logistic regression analyses (Table 3).

Table3 Prevalence of HBsAg by socio demographic characteristics among study participants in Jimma Zone, South West Ethiopia, from March 10- April 20/2018

Variable	Category	HBsAg infection status		COR(95%CI)	p-value
		Positive (%)	Negative (%)		
Age group (Year)	18- 24	5(1.5)	329(98.5)	0.19(0.04-0.82)	0.026*
	25- 34	8(4.6)	166(95.4)	0.59(0.15-2.35)	0.458
	≥35	3(7.5)	37(92.5)	1	0.046
Sex	Male	12(4.5)	256(95.5)	3.23(1.03-10.16))	0.044*
	Female	4(1.4)	276(98.6)	1	
Marital Status	Single	8(2.5)	311(97.5)	0.44(0.53-3.70)	0.448
	Married	7(3.3)	204(96.7)	0.58(0.068-5.02)	0.624
	Separated	1(5.6)	17(94.4)	1	
Residence	Urban	14(3.2)	430(96.8)	1.66(0.32-7.42)	0.507
	Rural	2(1.9)	102(98.1)	1	
Educational Level	Elementary	0(0)	16(100)	.000	0.999
	Secondary	5(3.1)	157(96.9)	0.93 (0.289-2.99)	0.640
	College diploma	4(2.5)	155(97.5)	0.75 (0.216-2.62)	0.654
	Degree and above	7(3.3)	204(96.7)	1	
Occupation	Employed	6(4.6)	124(95.4)	2.23 (0.74-6.77)	0.256
	Self employed	2(3.0)	65(97.0)	1.42(0.29-6.99)	0.666
	Daily laborer	1(4.8)	20(95.2)	2.31(0.271-19.68)	0.445
	Student	7(2.1)	323(97.9)	1	0.530

*candidate variables for multiple logistic regression (P-value < 0.25), COR Crude odds Ratio

5.4. Distribution of HBsAg positivity by clinical and treatment related variables

Concerning of the distribution of clinical related exposures in the study area, thirty six (6.6%) of the respondents had history of hospital admission and 12(2.2%) of them had exposed to history blood transfusion and the sero positivity among those exposed were 2(5.6%) and 1(8.3%) respectively. The majority of respondents 502(91.6%) were not vaccinated for Hepatitis B virus infection and they took the higher prevalence of HBsAg 15 (3.0%) as compared to vaccinated participants

Based on the bivariate analysis, none of clinical related factors were selected as a candidate for multivariable logistic regression analyses (Table 4).

Table 4 Distribution of HBsAg positivity by clinical related factors among study participants in Jimma Zone, South West Ethiopia, from March 10- April 20/2018

Variable	Category	HBsAg infection status		COR(95%CI)	p-value
		Positive (%)	Negative (%)		
Hospital admission	Yes	2(5.6)	34(94.4)	2.09(0.457-9.58)	0.342
	No	14(2.7)	498(97.3)	1	
History of surgical procedure	Yes	1(4.3)	22(95.7)	1.55(0.195-12.23)	0.680
	No	15(2.9)	510(97.1)	1	
Blood transfusion	Yes	1(8.3)	11(91.7)	3.158(0.38-26.06)	0.286
	No	15(2.8)	521(97.2)	1	
History of dental procedures	Yes	3(3.7)	79(96.3)	1.323(0.37-4.75)	0.667
	No	13(2.8)	453(97.2)	1	
Taking Hepatitis B vaccine	Vaccinated	1(2.2)	45(97.8)	0.721(0.09-5.59)	0.755
	Not vaccinated	15(3.0)	487(97.0)	1	

* Candidate variables for multiple logistic regression (P-value < 0.25), COR Crude odds Ratio

5.5. Distribution of HBsAg positivity by behavioral and knowledge related factors

Forty four (8.0%) of study participants were using razor and other sharp material together and 19 (3.5%) were had multiple sexual partners. Among those participants the prevalence of HBsAg were 2(4.5%) and 1(5.3%) respectively. While 23 (4.2%) of study participants were exposed unsafe therapeutic drug injection and their sero positive for HBsAg 3(13.0%) was higher than those who were not exposed but not statistically significant.

Of 548 study participants, 313(57.1%) donated blood for more than one times and the prevalence of Hepatitis B virus was higher 11(4.7%) among first time volunteer blood donors and among blood donors with poor knowledge 4(3.8%)

Based on bivariate analysis, history of using unsafe therapeutic drug injection and number of blood donation variable were candidates for multivariable logistic regression analyses.

Table 5 Distribution of HBsAg positivity by behavioral related factors among participants in Jimma Zone, South West Ethiopia, from March 10- April 20/2018

Variable	Category	HBsAg infection status		COR(95%CI)	p-value
		Positive (%)	Negative (%)		
Razor and sharp material sharing	Yes	2(4.5)	42(95.5)	1.67(0.37-7.580)	0.509
	No	14(2.8)	490(97.2)	1	
Unprotected multiple Sex	Yes	1(5.3)	18(94.7)	1.89(0.24-15.12)	0.547
	No	15(2.9)	511(97.1)	1	
Tattooing, Ear/Nose pierce	Yes	4(4.8)	80(95.2)	1.88(0.593-5.99)	0.283
	No	12(2.6)	452(97.4)	1	
unsafe therapeutic drug injection	Yes	3(13.0)	20(87.0)	5.91(1.56-22.39)	0.009*
	No	13(2.5)	512(97.5)	1	
Number of donation	Repeated	5(1.6)	308(98.4)	0.33(0.11-0.97)	0.043*
	First time	11(4.7)	224(95.3)	1	
Knowledge	Good knowledge	12(2.7)	431(97.3)	0.70 (0.22-2.23)	0.549
	Poor knowledge	4(3.8)	101(96.2)	1	

* Candidate variables for multiple logistic regression (P-value < 0.25), COR Crude odds ratio

5.6. Risk Factors for Hepatitis B Viral Infection

Those candidate variables in the bivariate analysis were entered into the multiple logistic regression models in order to control confounders and to evaluate the net effects of risk variables on hepatitis B viral infections among studied group.

From socio-demographic factors sex (p-value = 0.045) and age group (18-24 and ≥ 35 (p-value = 0.026 and 0.046 respectively) and from behavioral related factors history of exposure to unsafe therapeutic drug injection (p-value = 0.009) and number of blood donation (p-value=0.043) were the variables identified for multivariable logistic regression analyses (Table 6)

Table 6 Multivariable logistic regression analyses of the factors associated with HBsAg among volunteer blood donors in Jimma Zone, South Ethiopia, from March 10- April 20/2018

Variable	Category	COR(95%CI)	AOR(95%CI)	p-value
Age group	18-24	0.19(0.043-0.82)	0.17(0.036-0.78)	0.022**
	25-34	0.59(0.150-2.35)	0.53(0.127-2.24)	0.391
	≥ 35	1	1	0.044**
Sex	Male	3.19(1.015-10.01)	3.28(1.005-10.68)	0.049**
	Female	1	1	
Number of donation	Repeated	0.33(0.11-0.97)	0.25(0.08-0.76)	0.015**
	First time	1	1	
unsafe therapeutic drug injection	Yes	5.91(1.56-22.39)	6.98 (1.67-29.30)	0.008**
	No	1	1	

**Statistically significant (p-value<0.05), COR- Crude odds Ratio, AOR- Adjusted odds Ratio

Following the multiple logistic regression analysis performed using forward stepwise method sex, Age (groups 18-24), and number of donation and history exposure to unsafe therapeutic drug injection had remained statistically significant factors for hepatitis B viral infections.

When positivity was compared among sex of study participants, male volunteer blood donors were about 3 times more likely to have HBV infection than female donors {AOR=3.28, 95%CI: 1.01-10.68 (p-0.049)}

Regarding age group of study participants, more than two third (68.6%) of participants tested positive were age more than 25 years. When we compare probability of being positive for HBsAg , donors within age group 18-24 were 83% less likely to have HBV infection than that of age group ≥ 35years old {AOR=0.17, 95%CI: 0.036-0.78 (p-0.015)}.

Concerning number of blood donation, volunteers who was donated blood more than one times was about 75% less likely to have HBV infection than first time donors {AOR= 0.25, 95%CI: 0.08-0.76 (p-0.015)}.

From volunteer donors, 23(4.2%) were exposed to unsafe therapeutic drug injection and from those 3(13.0%) were positive for HBsAg. When compare positivity among them, volunteers who exposed to unsafe therapeutic drug injection were about 7 times more likely

to have HBV infection than who were not exposed {AOR= 6.98, 95%CI: 1.66-29.29 (p-0.008)}.

Concerning marital status of participants the positivity was slightly higher among separated couples 1(5.6%) than single and married 8(2.5%) and 7(3.3%) respectively but it was also not statistically significant.

Similarly, being educated, being daily labor, having poor knowledge about HBV, having history of transfusion, sharing sharp materials, exposure to surgical operations, having multiple sex, having body tattooing and tooth extraction were also not statistically significant. This might be due to homogeneity of study population as majority of participants were students.

CHAPTER SIX

DISCUSSION

In this study an attempt has been made to determine the prevalence of hepatitis B virus infection and associated factors among volunteer blood donors in Jimma Zone. Surveys related to hepatitis B virus infection which were done previously would help in comparing the findings of this study.

The proportion of male and female donors in this study were approximately equal 268(48.9%) and 280(51.1%) in contrast the previous studies from some parts of Ethiopia showed majority of blood donors were male donors, 87.9% in Gondar, 74.6% in Wolaita and 98.7% Jigjiga (40,54,59). This may show that the awareness of males and females became comparable with respect to blood donation due to majority of current study participants were students 330 (60.2%).

Majority of the participants 334(60.9%) were aged between 18-24 years. The findings of this study partly in agreement with a study conducted in Hawasa 86.2%, in Arba Minch 80.2% and also WHO report that 45.0% of blood donors aged 25 or less. (43, 56, 22) Routinely Blood Bank activities were targeted on donors of a younger age, mostly high school and college students, as this group are perceived to be more willing to donate blood and also a low risk group.

The prevalence of HBsAg among volunteer blood donors in study was 16(2.9%). WHO classifies the endemicity of HBV based on the sero-positivity rate of HBsAg, as low endemicity area (less than 2% sero positive), intermediate endemicity area (2% to 7% sero positive) and high endemic area (those having higher than 7% sero positive). (17) Based on this perspective the result indicates the study area is categorized in an intermediate endemicity to HBV infection.

This finding also in line with retrospective study conducted in Jimma Blood Bank from 2010 to 2015 that revealed HBsAg prevalence among blood donors 3.05%. (27)

The prevalence of HBsAg in this study was higher than research conducted in somewhere else in Eritrea 2.6 %, Egypt 2.3%, India 1.9%, Jordan 1.4% (60, 61, 45, 46) This is probably because of the differences in social behavior, lifestyle, socioeconomic status and level of awareness in different countries.

In contrast, it is lower than the study conducted in Yemen 5.1%, Cameroon 11.2%, Nigeria 9.3%, and South Dar fur 6.3% (48-51). Which might be due to the fact that, most of the study participants in the previous study were family replacement and commercial blood donor whereas only voluntary donors were included in this study.

Similarly the finding of this study was lower when compared with similar study conducted in Ethiopia, national wide 3.9%, Bahir Dar 4.1%, Wolaita Sodo 9.6%, Arba Minch Blood Bank 4.7% (52-54, 56). This might be due to the previous studies includes replacement type of blood donation and higher number of first time blood donors. Although, some possible differences in specificity and sensitivity of screening tests used at different sites during the time of screening might also explain in-part for the observed variations.

Among the potential risk factors only sex, age group, number of donation and using unsafe therapeutic drug injection among volunteer blood donors were found to have a significant association with HBsAg positivity. From those being male donor was about 3 times more likely to have HBV infection than female donor. This finding consistent with other studies in Gondar, Dire Dawa and Jimma (40, 44, 58) This association might be attributed by cultural practices which could expose to HBV infection like male circumcision using non-sterile equipment and while in male beauty salons which may uses unsterilized barbing utilities.

When we compare the positivity of HBsAg among the age group of study subject, participants in age group 18-24 were about 83% less likely to have HBV infection than those who were in age group ≥ 35 years. This result in line with studies conducted in Jimma Blood Bank from 2010 to 2015 and in Gonder in 2010 (27, 40). This might be due to this age group less exposed to risk factors like occupational risk and unsafe sex.

Similarly studies conducted in India, Nigeria and Dar fur shows the prevalence of hepatitis B higher among ≥ 35 years significantly statistical association with Hepatitis B infection (45, 50, 51).

In this study the number of blood donation also had significantly associated with Hepatitis B virus infection. When we compare prevalence of HBsAg, participants who had previous history of donation were about 75% times less likely to have HBV infection than those first time donors. This finding also in line with other studies conducted in Gonder where the prevalence of HBV among first time donor about two times more likely to have HBsAg infection than repeated donor and Yemen where first time donor had 22 times more likely to

have HBsAg infection than repeated donor (40, 48). This might be due to most new donors have not been previously tested for markers of infections used to exclude individuals from the donor population and repeated donor get awareness about the disease transmission.

Another significantly associated factor was use of unsafe therapeutic drug injection .When we compare, donors who exposed to unsafe therapeutic drug injection were about 7 times more likely to have HBV infection than who were not exposed and this finding was in line with the study conducted in Arba Minch, Jimma university specialized hospital and also WHO report in developing countries, contaminated injections caused an estimated 21 million HBV infections worldwide in 2000, accounting for 32% of all new infections (56, 58, 8). This might be due to therapeutic injection giver using contaminated syringes or other materials and unsafe procedure.

Majority of potential risk factors included in the study were not significantly associated with HBV infection. This might be due to homogeneity of study population as majority of participants were young students.

6.1. Limitation of the study

The sero markers used for assessment of HBV infection is not complete; HBV DNA was not detected by polymerase chain reaction due to unavailability of resources, which may increase the detection rate of HBV which may increase prevalence

The question related to previous exposure history was make somewhat recall bias among participants

Most factors tested for association with hepatitis infection were not found significant at 95% CI which might be due to homogeneity of study participants and this study was limited to investigate associated factors among heterogeneous population.

CHAPTER SEVEN:

CONCLUSION AND RECOMMENDATION

7.1. Conclusion

The overall prevalence of HBsAg among volunteer blood donors participated in this study was 16 (2.9%)

Factors such as male sex, first time donation and history of exposure to unsafe therapeutic drug injection were identified to be (high risk) factors independently associated with positive HBsAg status.

7.2. Recommendation

The blood donors in this study were voluntary subjects who are apparently healthy, but this study found that HBV infections are prevalent. Thus, strict selections of blood donors with standard methods are highly recommended to ensure the safety of blood for the recipient and to prevent HBV infection

Proper pre donation counseling and donor self-exclusion and encouraging regular volunteer blood donation are some of the effective control measures.

Minister of Health

Strengthening health system to control unsafe therapeutic drug injection givers may help in preventing and controlling disease propagation.

Health institution

All Health institution should work on IEC (information education communication) activities on HBV infections, to improve community awareness

Blood Bank

It might be important for the Blood Bank to continue focusing blood donation exercise on age group below 25 years and repeated volunteer blood donors.

Counseling of donors for repeated volunteer blood donors should be strengthened to exclude donors based on previous test results.

Since Blood Bank mobilize community for blood donation, side by side should work on activities of HBV infections prevention to improve community awareness.

For researchers

Further studies with large sample size should be conducted in different population groups in the form of long term follow up analyses to determine the different factors associated with HBV infection

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Annex 1: English version of information sheet, consent form and Questionnaire

JIMMA UNIVERSITY INSTITUTION OF PUBLIC HEALTH DEPARTMENT OF EPIDEMIOLOGY

Questionnaire prepared to identify prevalence and associated factors of HBV among volunteer blood donors in Jimma zone who donate blood for Jimma blood bank during March 10- April 20/2018

Hello. My name is ---------- I am one of the data collectors working with Mr. **Debele Mekonnen** in the study of the above topic. We are assessing Prevalence of Hepatitis B virus among volunteer blood donors in Jimma zone. We would very much appreciate your participation in this study. The information will help to improve the quality of blood bank service. Whatever information you provide was kept strictly confidential and will not be shown to other person. Participation in this study is voluntary and you can choose not to answer any individual question or all of the questions. However, I hope that you will participate freely in this survey since your views are important.

The aim of the study is to determine the prevalence and associated risk factors of HBV among volunteer blood donors, which is the cause post transfusion infection. We would greatly appreciate your help in responding to this survey. The survey will take about 10-15 minutes to answer the questions.

Confidentiality: Any information that we will collect about you during this study was kept confidential and your identity was put away after re-coding your file and kept in a secured place. Only the principal investigator was able to link your identity with the code number, if this becomes necessary to assist you in any way.

Right to refuse: Since participation in this study is entirely voluntarily, you can refuse to participate in this study at any time. Your refusal will not affect your job

Would you be willing to participate?"

1. Yes 2. No

If yes, proceed. If no, thank and stop here.

Contact Address:

If there are any question or enquires any time about the study or the procedures, please contact:

Debele Mekonnen **Mobile phone**: +251 -913-1430-29 **E-mail**: debexmak@gmai.com

Personal information: Code number _____ Date_____

Region oromia Zone Jimma SITE _____ found in the Jimma zone

S. No	Questions	Response of categories	Skip
100	**Section I: Socio Demographic characteristics**		
101	Age?	_____year	
102	Sex	1. Male 2. Female	
103	Marital status	1. Single 2. Married 3. Divorced 4. widowed	
104	Resident	1. Urban 2. Rural	
105	Educational status	1. Illiterate 2. 1-8 3. 9-12 4. College diploma 5. Degree and above	
106	Your occupation?	1. Employed 2. House wife/home activities 3. Daily laborer 4. Merchant 5. Farmer 6. Student 7. Jobless 8. Other Specify_____	
200	**Section II: Knowledge related questions on Hepatitis**		
201	Have you ever heard of a disease termed as Hepatitis /liver disease?	1. Yes 2. No 99. No response	If no go to Q.301
202	Have you ever heard of a disease termed as Hepatitis B?	1. Yes 2. No 99. No response	
203	If yes for Q201& Q202 from where you heard?	1. From media 2. From peers 3. From Neighbors 4. From health professional 5. Other specify ……..	
204	Is Hepatitis B a viral disease?	1. Yes 2. No 88. Don't know	

		99. No response	
205	Can Hepatitis B cause liver cancer?	1. Yes 2. No 88. Don't know 99. No response	
206	Do you hepatitis B disease is transmitted from infected person to healthy one?	1 Yes 2 No 99. No response	
207	Can liver disease caused by Hepatitis B be transmitted by unsafe sex?	1. Yes 2. No 88. Don't know 99. No response	
208	Can liver disease caused by Hepatitis B be transmitted by un-sterilized syringes, needles and surgical instruments?	1. Yes 2. No 88. Don't know 99. No response	
209	Can liver disease caused by Hepatitis B be transmitted by using blades of the barber/ear and nose piercing or tattooing instrument?	1. Yes 2. No 88. Don't know 99. No response	
210	Can liver disease caused by Hepatitis B be transmitted from mother to child?	1. Yes 2. No 88. Don't know 99. No response	
211	Can liver disease caused by Hepatitis B be transmitted by food and water contaminated by person infected with this disease?	1. Yes 2. No 88. Don't know 99. No response	
212	Can liver disease caused by Hepatitis B be transmitted by blood and blood products?	1. Yes 2. No 88. Don't know 99. No response	
213	Can Hepatitis B cause liver disease affect any age group?	1. Yes 2. No 88. Don't know 99. No response	
214	The early symptoms for liver disease caused by hepatitis B are same like cold and flu(fever, cough and running nose)	1. Yes 2. No 88. Don't know 99. No response	
215	Jaundice is one of the common symptoms of liver disease caused	1. Yes 2. No	

	by hepatitis B	88. Don't know 99. No response	
216	Is Hepatitis B infection no symptoms in some people?	1. Yes 2. No 88. Don't know 99. No response	
217	Is liver disease caused by Hepatitis B is curable/treatable?	1. Yes 2. No 88. Don't know 99. No response	
218	Can liver disease caused by Hepatitis B be self-cured by the body?	1. Yes 2. No 88. Don't know 99. No response	
219	Is vaccination available for liver disease caused by Hepatitis B?	1. Yes 2. No 88. Don't know 99. No response	
300	**Section III: Clinical related questions**		
301	Have you ever been hospitalized?	1. Yes 2. No 88. Don't know 99. No response	
302	Have you ever had history of surgical procedure?	3. Yes 4. No 88. Don't know 99. No response	
303	Do you have received blood and blood products?	1. Yes 2. No 99. No response	If no go to Q.305
304	If yes how many times?	1. Single 2. Multiple time 88. Don't know 99. No response	
305	Have you taken vaccination for hepatitis B?	1. Yes 2. No 99. No response	If no go to Q.307
306	If yes how many times?	1. One times 2. Two times 3. Three times 88. Don't know 99. No response	
307	Have you ever had use injectable	1. Yes	

	drug?	2. No 99. No response	
308	Have you had a tooth extraction?	1. Yes 2. No 99. No response	If no go to Q.401
309	If yes where?	1. Traditional 2. Modern 88. Don't know 99. No response	
400	**Section IV: Behavioral related questions**		
401	Have you had unprotected sexual contact other than regular partner?	1. Yes 2. No 99. No response	
402	Have you had a tattoo or permanent make-up applied by needles?	1. Yes 2. No 99. No response	
403	Have you had share razor & sharp materials together?	1. Yes 2. No 99. No response	
404	Have you ever donate blood and blood products?	1. Yes 2. No 99. No response	

Thank You for Participation!!

Annex 2: Amharic version of information sheet, consent form and Questionnaire

JIMMA UNIVERSITY INSTITUTION OF PUBLIC HEALTH DEPARTMENT OF EPIDEMIOLOGY

ስለ ጥናቱ መረጃ እና የተሳትፎ ፍቃድ መጠየቂያ ቅጽ

ስሜ _____ ይባላል::እኔ በጅማ ዩኒቨርሲቲ በህብረ-ተሰብ ጤና እንስቲትዩት የኢፒዲሞሎጂ የትምህርት ክፍል ተመራቂ ተማሪ በሆኑት በአቶ **ደበሌ መኮንን** እየተሰራ ባለው የሁለተኛ ዲግሪ የመመረቂያ ጥናት ላይ መረጃ ሰብሳቢ ነኝ :: የምጠይቀው የበጎ ፍቃድ ደም ለጋሽ ደንበኞችን ሲሆን፤ ይህ መጠይቅ የተሳታፊዎችን ማህበራዊኑዳዮችን፤ ባህሪያቸውን፤ የህክምና ና በጉበት በሽታ ዙሪያ ያላቸውን እውቀት የሚዳስሱ ጥያቄዎችን በአራት ክፍሎች ያካትታል::

አላማው:- እኛ የምናጠናው በኦሮምያብሔራዊ ክልላዊ መንግስት ጅማ ዞን ውስጥ በሚገኝ የበጎ ፍቃድ ደም ለጋሽ ሰዎች ላይ የሔፓታይተስ ቢ ቫይረስ ስርጭትን ና ተያያዥ ምክኒያቶቻቸውን ሲሆን በሚገኘውም የጥናት ውጤትም ችግሩን ለመቅረፍ የሚያስችሉትን ስልቶችን ማመላከት ይሆናል ::የጥናቱ አባላት እርሶ ና ሌሎችን በፍቃደኝነት በጥናቱ እንድትሳተፉ እንጠይቆታለን፣ከእርስዎ የሚጠበቀው 10-15 ደቂቃ የሚፈጁ መጠይቆችን መመለስ ነው::

የጥናቱ ምስጢራዊነት

ማንኛዉም በጥናቱ የተገኙ መረጃዎች ምስጢራዊነቱ የተጠበቀ ነዉ። የጥናቱ መረጃዎች በሙሉ የተቀመጡት ለጥናቱ ተብለው በሚሰጠው ስውር ቁጥር ሲሆን ጥናቱን ከሚያስከሄደት ባለሙያዎች በስተቀር ማንም ልያውቅ አይችልም:: የጥናቱ ተሳታፊ ማንነት በሚገለጥ መሌኩ የተዘጋጀውን መረጃ የጥናቱ ተሳታፊ በፊርማዉ የተረጋገጠ ፍቃዴ ሳይሰጥ ይፋ አይዯርግም:፡ ይህ ጥናት ሳይንሳዊ መረጃ እንዯ መሆኑ መጠን በወረቀት ታትሞ ቢወጣ ወይንም በሚዱያ ቢነገር የጥናቱ ተሳታፊ ስም በምንም መልኩአይጠቀስም፡:

በጥናቱ ያለመሳተፍመብት:- በዚህ ጥናት መሳተፍ የእርስዎን ሙሉ ፈቃድ እንደመጠየቁ መጠን በማንኛውም ጊዜ በጥናቱ አለመሳተፍ መብትዎ የተጠበቀ ነው፣ በጥናቱ አለመሳተፍ በህይወትዎ የሚያመጣው ምንም አይነት ጫና የለም፣ ጌታዬ/እመቤቴ ስለጥናቱ ጥያቄ አለዎ? በጥናቱ ለመሳተፍፍ ቃደኛነዎት? ከተስማሙ የፍቃድማረጋገጫ ቅጹን ይሙሉልን፣

አዎ ----------- አይ----------

የተሳታፊው ፊርማ _____ቀን _____
የፍቃድ ተቀባይ ስም አቶ/ወ/ሮ/ወ/ት_____ፊርማ_____

ስለ ጥናቱ ማንኛዉም ጥያቄ ወይም ቅሬታ ስኖራቸዉ የሚከተለትን ስሌክ ወይም ኢሜል አዴራሻ በመጠቀም የጥናቱን ባለቤቶች ማነጋገር ይችሊለ::

አቶ ደበሌ መኮንን : **ስሌክ** +251-913-1430-29, **ኢሜል**: debexmak@gmail.com

ስለ ጥናቱ መጠይቅ በተመለከተ

የተሳታፊው መለያ ቁጥር---------- ቀን ---------- ክልል---------- ዞን --------- ወረዳ----------

ከሄፓታይቴስ ቢ ና ሲ ቫይረስ ልያጋልጡ የሚችሉ ነገሮችን መዳሰስ

ተ.ቁ	ጥያቄ	በየ ክፍሉ የተሰጠ መልስ	የሚዘለል
100	**ክፍል አንድ ፡ ስነ-ማህበራዊ ጥያቄዎች**		
101	እድሜዎትስንትነው?	_____ዓመት	
102	ጾታ	1. ወንድ 2. ሴት	
103	የጋብቻ ሁኔታ	1. ያላገባ(ች) 2. ያገባ(ች) 3. የፈታ(ች) 4. የመተባት(በት)	
104	የምኖርያ አድራሻዎ	1. ከተማ 2. ገጠር	
105	የት/ት ደረጃ	1. ያልተማረ 2. 1-8 3. 9-12 4. ቴክኒክናሙያ ድፕሎማ 5. ድግርና ከዚያ በላይ	
106	ሥራዎ ምንድ ነው	1. ተቀጣሪ 2. የቤት እመቤት 3. የቀን ሰራተኛ 4. ነጋዴ 5. ገበሬ 6.ተማሪ 7.ሥራ አጥ 8.ሌላ ከሆነይግለጽ _____	
200	**ክፍል ሁለተ፡ በሄፓታይተስ በሽታ ዙሪያ ያላቸውን እውቀት የሚዳስሱ ጥያቄዎች**		
201	ሰለጉበት በሽታወይም የወፍ በሽታ ወይም አይን ብጫ የሚያደርግ በሽታ ሰምተው ያውቃሉ?	1. አዎ 2. አይ 99. ይለፈኝ	መልሰዎ አይ ከሆነ ወደ ጥያቄ 301 ይለፉ
202	ሄፓታይተስ ቢ ስለሚባል ጉበት /በሽታ አምጪ ተዋሲያ/ ሰምተው ያውቃሉ?	1.አዎ 2.አይ 99. ይለፈኝ	

203	ለ ጥያቄ 201 እና/ ወይም 202 መልሶ አዎ ከሆነ የመረጃዎ ምንጭ ምነድነው?	1. ከሚዲያ 2. ከ ጓደኛ 3. ከነረቤት 4. ከ ጤና ባለሞያ 5. ሌላ ከሆነ ግለጽ----------	
204	ሄፓታይተስ ቢ ስለሚባል /የጉበት በሽታ የ ቨይረስ አምጪ በሽታ ነው	1.አዎ 2.አይ 88.አላቀውም 99. ይለፈኝ	
205	ሄፓታይተስ ቢ የጉበት ካነሰር ልያመጣ ይችላል?	1.አዎ 2.አይ 88.አላቀውም 99. ይለፈኝ	
206	ሄፓታይተስ ቢ የጉበት በሽታ ከታመመ ሰው ወደ ጤነኛ ሰው ይተላለፋል?	1.አዎ 2.አይ 88.አላቀውም 99. ይለፈኝ	መልሰዎ አይ ከሆነ ወደ ጥያቄ 209 ይለፉ
207	ልቅ የግብረ ስጋ ግንኙነት የጉበት በሽታ ሊያስተላልፍ ይችላል	1.አዎ 2.አይ 88.አላቀውም 99. ይለፈኝ	
208	ያልተጸዱ መርፌዎች፤ሲሪንጆችና የቀዶጥገና መሳሪያዎች የጉበት በሽታ ሊያስተላልፉ ይችላሉ።	1.አዎ 2.አይ 88.አላቀውም 99. ይለፈኝ	
209	የፀጉር ቤት ምላጮች፤ የጆሮና የአፍንጫ መብሻና የንቅሳት መሳሪያዎች የጉበት በሽታ ሊያስተላልፉ ይችላሉ።	1.አዎ 2.አይ 88.አላቀውም 99. ይለፈኝ	
210	የጉበት በሽታ ከናት ወደ ልጅ ሊተላለፍ ይችላል።	1.አዎ 2.አይ 88.አላቀውም 99. ይለፈኝ	
211	የጉበት በሽታ ከታመመ ሰው ጋር አብረዉ በመብላትና በመጠጠት ሊተላለፍ ይችላል።	1.አዎ 2.አይ 88.አላቀውም	

		99. ይለፈኝ	
212	የጉበት በሽታ በ ተበከለ ደምና የደም ውጤቶች ሊተላለፍ ይችላል፡፡	1.አዎ 2.አይ 88.አላቀውም 99. ይለፈኝ	
213	የጉበት በሽታ አምጪ ተዋሲያን ማንኛውንም የእድሜ ክልል ሊያጠቁ ይችላሉ።	1.አዎ 2.አይ 88.አላቀውም 99. ይለፈኝ	
214	የመጀመርያ የጉበት በሽታ ምልክቶች ልክእንደ ጉንፋንና እንደ ፍሉ ትኩሳት፣ሳል ላለው፡፡	1.አዎ 2.አይ 88.አላቀውም 99. ይለፈኝ	
215	የአይንና የቆዳ ከለር ቢጫ የሚሆነው የጉበት በሽታ ምልክቶች ዉስጥ አንዱ ነዉ	1.አዎ 2.አይ 88.አላቀውም 99. ይለፈኝ	
216	የጉበት በሽታ ምልክቶች ላያሳይ ይችላል?	1.አዎ 2.አይ 88.አላቀውም 99. ይለፈኝ	
217	በተዋሲያን /በ ሄፓታይተስ ቢ/ የሚመጣ የጉበት በሽታ ህክምና አለው/ ይድናል?	1.አዎ 2.አይ 88.አላቀውም 99. ይለፈኝ	
218	የጉበት በሽታ በራሱ ጊዜ ልድን ይችላል	1.አዎ 2.አይ 88.አላቀውም 99. ይለፈኝ	
219	የጉበት በሽታ ክትባት አለው	1.አዎ 2.አይ 88.አላቀውም 99. ይለፈኝ	
300	**ክፍል ሶስተ፡ የህክምና ሁኔታን የሚዳስሱ ጥያቄዎች**		
301	ሆስፒታል ታመው ተኝተው ያውቃሉ?	1.አዎ 2.አይ	

		99. ይለፈኝ	
302	ቀዶ ጥገና ተሰርቶሎት ያውቃል?	1.አዎ 2.አይ 99. ይለፈኝ	
303	ደምና የደም ውጤቶችን ወስደው ያውቃሉ?	1.አዎ 2.አይ 99. ይለፈኝ	መልሰዎ አይ ከሆነ ወደ ጥያቄ 305 ይለፉ
304	ወስደው ከሆነ ለስንት ግዜ ወሰዱ?	1. ለ አንድ ግዜብቻ 2. ከ ሁለት ግዜ በላይ 88.አላቀውም 99. ይለፈኝ	
305	የሄፓታይተስ ቢ ክትባት ወስደዋል?	1.አዎ 2.አይ 99. ይለፈኝ	መልሰዎ አይ ከሆነ ወደ ጥያቄ 307 ይለፉ
306	ወስደው ከሆነ ስንቴ ነዉ የወሰዱ?	1. ለ አንድ ግዜ ብቻ 2. ለ ሁለት ግዜ 3. ለ ሶስት ግዜ 88.አላቀውም 99. ይለፈኝ	
307	ደህንነቱ ያልተረጋጤ መርፌ የህክምና መድኃኒት ተወግተው ያውቃሉ?	1.አዎ 2.አይ 99. ይለፈኝ	
308	የጥርስ ህክምና/ለምሳለ፤ ማስነቀል/አሰርታው ያውቃል?	1.አዎ 2.አይ 99. ይለፈኝ	መልሰዎ አይ ከሆነ ወደ ጥያቄ 401 ይለፉ
309	አስወልቀዉ ከሆነ ያስወለቁት በባህላዊ ወይስ በዘመናዊ	1. በባክላዊ ህክምና 2. በዘመናዊ ህክምና 3.አላቀውም 4. ይለፈኝ	
400	**ክፍል አራት፡ ለሄፓታይተስ ቢ የሚያጋልጡ ድርጊቶችን የሚመለከቱ ጥያቄዎች**		
401	ጥንቃቄ የጎደለ የግብረ ሥጋ ግኙኝነት ከትዳር አጋረዉ ዉጪ አድርገው ያዉቃሉን?	1.አዎ 2.አይ 99. ይለፈኝ	

402	ንቅሳት ተነቅሰዋል፣ ሰውነቶን ወይንም ቋሚ የሆነ የሰውነት ማስዋቢያ ተደርጎሎታልን?	1.አዎ 2.አይ 99. ይለፈኝ	
403	ምላጪና ስለታማ ነገሮችን በጋራ ተጠቅመው ያውቃል?	1.አዎ 2.አይ 99. ይለፈኝ	
404	ደምና የደም ውጤቶችን ለግሰዉ ያውቃሉ?	1.አዎ 2.አይ 99. ይለፈኝ	

ስለ ተሳተፉ ከልብ እናመሰግናለን !!

Annex 3: Afan Oromo version of information sheet, consent form and Questionnaire

JIMMA UNIVERSITY INSTITUTION OF PUBLIC HEALTH DEPARTMENT OF EPIDEMIOLOGY

Akkam bultan /akkam ooltan

Ani maqaa koo ---------- jedhama ani Qorannoo batrataan Jimma Universitii departimentii epidemolojii kan ta'e barataa digirii lammaffa Obbo **Dabalee Makonnin** kan adeemsifamuuf sassaabduu saamudaaati.Kanaaf fedhii keessan irratti hundaa'uun gaaffileen kutaaleee afuriin qoodameeisiniif dhiyeesa

Kaayyoo qorannichaa tatamsa'iinsa dhukkuba tiruu (Heepaataayitas B) fi Sababoota ittiin dhufu namoota fedhii isaanitiin dhiiga laatan irratti maal akka fakkaatu yoota'u bu'aan qorannichaas dhiiga qulqulluu ta'e dhukkubsataaf dhiyeessuu irratti ga'ee guddaa qaba. Kanaafuu gaafilee kana deebisuuf daqiiqaa 10-15 qofa isinitti fudhachuu danda'a waan ta'eef deebisuufis dhiisuufis mirga qabdu,akkasumas icciitii deebii keessanii fibu'aan qorannoo keessanii kaneeggameefi daataan ifatti ba'uu danda'u kan cuunfamee fi eenyummaan isaa ifatti kan hin beekkamne ta'a qorannoo kana hirmaachuu yoon hin barbaadne ykn yoon addaan kute ,ammas ta'ee fulduraaf fayyadamummaa kiyyarratti rakkoo tokkoollee akka hin uumnee naaf himameera.

Nan barbaada…… hin barbaadu……

Maqaa hirmaataa…… mallattoo …… guyyaa…….

Maqaa qo'ataa obbo Dabalee Makonnin

Qoranno kana ilaalchisee gaafilee kamiyyuu qabdan lakk. Bilbilaa armaan gadiitiin nu argachuu dandeessu.

Dabalee Makonnin **bilb.** +251-913-1430-29 **E.mail** debexmak@gmail.com

Koodii hirmaataa…… guyyaa……. Godina ……. Aanaa…….

T.L	Gaafilee	Deebii gaafilee	Irradarbi
100	**Kutaa I: Gaafilee Hawaasummaa**		
101	Umrii	Waggaa _____	
102	Saala	1. Dhiira 2. Dubara	
103	Haala Gaa'ilaa	1. Qeerroo 2. Suubboo 3. Kan hiike 4. Kan jalaa du'e/te	
104	Teessoo	1. Magaalaa 2. Baadiyyaa	
105	Sadarkaa barumsaa	1. Hin baranne 2. 1-8 3. 9-12 4. diploomaa Koollejjii 5. Digirii fi isaa oli	
106	Hojii	1. Hojjetaa mootummaa 2. Hojii mana keessaa 3. Hojjetaa guyyaa 4. Daldalaa 5. Qonnaan bulaa 6. Barataa 7. Hojidhabeessa 8. Kan biroo (ibsi)_____	
200	**Kutaa II: Gaafilee Hubannoo waa'ee Dhukkuba tiruu (HBV)**		
201	Waa'ee Dhukkuba tiruu /dhukkuba simbiraa jedhamu dhageessaa beektaa?	1 Eeyen 2 lakkii 88. Hin beeku 99. Dabarfadhu	Lakki yoo jette T.L 301
202	Waa'ee dhukkuba Hepatitis B dhageessanii beektuu	1 Eeyen 2 lakkii 88. Hin beeku 99. Dabarfadhu	
203	Yoo deebii lak. 201 fi 202 eyyen jettan eessaatii	1. Miidiyaa irraa 2. Hiriyaa kee irraa 3. Ollaa kee irraa 4. Ogeessa fayyaa irraa 5. Kan biroo (ibsi)_____	
204	Hepatitis B dhibee vaayirasiitii?	1 Eeyen 2 Lakkii 88. Hin beeku 99. Dabarfadhu	

205	Dhukkubni hepatitis B kaansarii tiruu fiduu danda'aa?	1 Eeyen 2 lakkii 88. Hin beeku 99. Dabarfadhu	
206	Dhukkubni tiruu dhukkubsataa irraa gara nama fayyaatti daddarbuu beektaa?	1 Eeyen 2 Lakkii 88. Hin beeku 99. Dabarfadhu	Lakki yoo jette T.L 209
207	Dhukkubni tiruu HBV dhufu karaa walqunnamtii saala daangaa hinqanee daddarbuu beektaa?	1 Eeyen 2 lakkii 88. Hin beeku 99. Dabarfadhu	
208	Dhukkubni tiruu HBV dhufu karaa meeshaalee akka lilmootiin daddarbuu beektaa	1 Eeyen 2 lakkii 88. Hin beeku 99. Dabarfadhu	
209	Dhukkubni tiruu HBV dhufu karaa meeshaalee akka niqisaataa fi gurra huraatii daddarbuu beektaa	1 Eeyen 2 lakkii 88. Hin beeku 99. Dabarfadhu	
210	Dhukkubni tiruu HBV dhufu karaa haadhaarra gara ilmaatti daddarbuu beektaa	1 Eeyen 2 lakkii 88. Hin beeku 99. Dabarfadhu	
211	Namoota dhukkuba kanaan qabaman waliin nyaachuun daddarbuu danda'aa?	1 Eeyen 2 lakkii 88. Hin beeku 99. Dabarfadhu	
212	Dhukkubni tiruu HBV dhufu karaa Dhiigaa fudhachuutii daddarbuu beektaa	3 Eeyen 4 lakkii 88. Hin beeku 99. Dabarfadhu	
213	Dhukkubni kun namoota umrii kamiinuu akka miidhu beektaa?	1 Eeyen 2 lakkii 88. Hin beeku 99. Dabarfadhu	
214	Qufaa ,ho'ina qaamaa fi funyaa keessaa dhangala'aan ba'uu mallattoo jalqaba dhukkuba kanaa ta'uu beektaa?	1 Eeyen 2 lakkii 88. Hin beeku 99. Dabarfadhu	
215	Ijii fi haalluun gogaa kelloo ta'uun mallattoo addaa dhukkuba kanaa ta'uu beektaa?	1 Eeyen 2 lakkii 88. Hin beeku	

		99. Dabarfadhu	
216	Dhukkubni kun namoota tokko tokko irratti mallattoo akka hin qabne beektuu?	1 Eeyen 2 lakkii 88. Hin beeku 99. Dabarfadhu	
217	Dhukkuba kana irraa fayyuun danda'amaa	3 Eeyen 4 lakkii 88. Hin beeku 99. Dabarfadhu	
218	Dhukkubni kun ofuma isaatiin yeroo tokko tokko akka fayyu ni beektuu?	1 Eeyen 2 lakkii 88. Hin beeku 99. Dabarfadhu	
219	Dhukkubni kun talaallii qabaachuu isaa beektuu?	1 Eeyen 2 lakkii 88. Hin beeku 99. Dabarfadhu	
300	**Kutaa III: Gaafilee bakka yaalaan walqabate**		
301	Kanaan dura mana yaalaa ciistee bektaa	1 Eeyen 2 lakkii 99. Dabarfadhu	
302	Kanaan dura yaala baqaqsanii hodhuu sii godhamee beekaa	1 Eeyen 2 lakkii 99. Dabarfadhu	
303	Kanaan dura dhiigni siif laatamee beekaa	1. Eeyen 2. lakkii 99. Dabarfadhu	Lakki yoo jette T.L 305
304	Eyyen yoo jette yeroo meeqa	1. yeroo tokko 2. Yeroo hedduu 88. Hin beeku 99. Dabarfadhu	
305	Talaallii dhibee HBV fudhattee	1. Eeyen 2. lakki 99. Dabarfadhu	Lakki yoo jette T.L 307
306	Yoo fudhatte ta'e yeroo meeqaaf?	1. yeroo tokko 2. Yeroo hedduu 3. yeroo sadii 88. Hin beeku 99. Dabarfadhu	
307	Qoricha lilmoon kennamu waraannattee bektaa	1. Eeyen 2. lakkii 99. Dabarfadhu	
308	Ilkaan buqqisiistee beetaa	1. Eeyen	Lakki yoo

		2. lakkii 99. Dabarfadhu	jette T.L 401
309	Eyyen yoo jette eessatti	1. Aadaan 2. Haala ammayyaan 88. Hin beeku 99. Dabarfadhu	
400	**Kutaa IV: Gaafilee Amala atiin walqabatan**		
401	Walqunnamtii saalaaa ofeeggannoo hin qabne taasistee beektaa	1. Eeyen 2. lakkii 88. Hin beeku 99. Dabarfadhu	
402	Niqisaata lilmoon baafamu tumattee	1. Eeyen 2. lakkii 88. Hin beeku 99. Dabarfadhu	
403	Meeshaalee akka qarabaa namoota biro waliin fayyadamtaa	1. Eeyen 2. lakkii 99. Dabarfadhu	
404	Kanaan dura dhiigni laatanii beektuu	1. Eeyen 2. lakkii 99. Dabarfadhu	

Hirmaannaa keessanif guddaa Galatoomaa!!!

Annex 4: ELISA test Principle, Procedures, Interpretation and

Calculation of cut-off value

For this study Wantai ELISA kit was used which was manufactured by Beijing Wantai biological pharmacy enterprise Co. Ltd.

Test Principle for HBsAg: it uses antibody sandwich ELISA method in which polystyrene micro well strips are pre-coated with monoclonal antibodies specific to HBsAg. Donor's serum or plasma sample is added to the micro wells together with a secondary antibody conjugated with horseradish peroxidase (HRP) and directed against a different epitope of HBsAg. During incubation, the specific immune-complex formed in the case of presence of HBsAg in the sample, is captured on the solid phase. After washing to remove sample serum protein and unbound HPR-conjugate, chromogen solution containing tetra methyl Benzedrine (TMB) and urea peroxidase are added to the walls. In the presence of the antibody-antigen-antibody (HRP) sandwich immune-complex, the colorless chromogens are hydrolyzed by the bound HPR conjugate a blue colored product. The blue color turns to yellow after stopping the reaction with sulfuric acid. The amount of color can be measured and is proportional to the amount of antigen in the sample. Wells containing sample negative for HBsAg remain colorless. Every detail procedure will be followed according to manufacture instruction.

Test procedure

Step 1: preparation: mark the plate as one blank, two negative and two positive controls

Step 2: Adding diluents: Add 20µl to each wells including Negative and Positive control except blank well

Step 3: Adding specimen: add 100µl of Negative, Positive and positive to respective wells except blank well

Step 4: Incubating: cover the plate and incubate at 37c for 60minutes

Step 5: Adding HRP-conjugate: After incubation remove cover from the plate and add 50µl to each wells including negative and positive control except blank well and mix gently

Step 6: Incubating: cover and incubate at 37c for 30minutes

Step 7: Washing: After incubation remove cover and wash 5 times with diluted washing buffer

Step 8: Coloring: add 50µl chromogen solution A and then 50µl chromogen solution B to all wells including blank well then incubate the plate at 37c for 30 minutes avoiding light. The enzymatic reaction b/n the chromogen solution and the HRP-conjugate produce blue color in positive and HBsAg positive specimen wells

Step 9: Stopping reaction: add 50µl of stop solution to each well and mix gently. Intensive yellow color develop in positive and HBsAg positive specimen wells

Step 10: Measuring the Absorbance: Calibrate the plate reader with the blank well and read the absorbance at 450nm with 10 minutes, calculate the cut off value and evaluate the result.

Interpretation and calculation of cut-off value: The result will be calculated by relating each sample optical density (OD) value to the cut-off value (CO) of the plate. If the cut-off reading is based on single filter plate reader, the result must be calculated by subtracting the blank OD value from the print report value of the sample control. In case the reading is based on dual filter plate reader, do not subtract the blank well OD from the print repot values of the sample and control.

Cut-off value (CO) = NC+0.06

(NC=the mean absorbance value for three negative control)

Negative result = S/CO <1

Positive result =S/CO ≥1

Borderline sample with absorbance to cut-off ratio between 0.9-1.1

The test kit has 100% Sensitivity and 99.78% specificity

ELISA result variable collection form

S. no	Code no.	ELISA test result		
		Positive	Negative	Unknown/invalid