ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCE

SCHOOL OF PUBLIC HEALTH

PREDICTORS OF HEPATITIS B VACCINATION PRACTICE AMONG THE GENERAL POPULATION OF JIGJIGA TOWN, EASTERN ETHIOPIA: APPLICATION OF HEALTH BELIEF MODEL.

BY: AHMEDNASIR ABDI MUSE (BSC)

ADVISORS: MIRGISSA KABA (MA, PhD),

EYOB FEYISSA (MD, MPH)

A THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES, ADDIS ABABA UNIVERSITY, IN PARTIAL FULFILLMENT FOR THE REQUIREMENTS OF DEGREE OF MASTER OF PUBLIC HEALTH (MPH) IN HEALTH PROMOTION AND HEALTH EDUCATION.

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Acronyms

AOR	Adjusted Odds Ratio
CHB	Chronic Hepatitis B
CI	Confidence Interval
COR	Crude Odds Ratio
CSA	Central Statistical Agency
DNA	Deoxyribonucleic Nucleic Acid
EFY	Ethiopian Fiscal year
FMOH	Federal Minister of Health
HB	Hepatitis B
HBM	Health Belief Model
HBsAg	Hepatitis B Surface Antigen
HBV	Hepatitis B Virus
HCC	Hepatocellular Carcinoma
HDV	Hepatitis D Virus
HH	Household
HIV	Human Immune Deficiency Virus
HRQL	Health Related Quality of Life
IRB	Institutional Review Board
KM	Kilo Meter
NGOs	Non-Governmental Organizations

PAS	Proportional Allocation to Size
PI	Principal Investigator
RHB	Regional Health Bureaus
SPSS	Statistical Package for Social Science
TV	Television
US	United States
WHO	World Health Organization

Abstract

Background: Chronic Hepatitis B (CHB) is an important public health problem in subsaharan African countries and the most serious type of viral hepatitis that causes cirrhosis and liver cancer. Prevention is considered as one of the best strategy to mitigate the problem. Yet, much is not known about predictors of HBV vaccination practice among the general population of Ethiopia specifically Jigjiga town.

Objective: To assess predictors of HBV vaccination practice among the general population of Jigjiga town using health belief model (HBM).

Method: A community based cross- sectional study was conducted from January 1 to 30, 2019 among 422 individuals aged 18 years and above. Data was collected using pretested structured questionnaire. Data was entered and cleaned using EpiData entry client software and analyzed using SPSS version 25.0. Descriptive and inferential statistics were conducted to present basic statistics. To identify predictors of HBV vaccination practice multiple logistic regression analysis were employed and significance was considered at $p< 0.05$.

Result: The response rate was 405(95.9%), and 401 questionnaires were considered for the analysis. The median age of the respondents was 31years with IQR (28-50 years). Out of the 321 respondents who heard about HB vaccine, 17(5.3%) of them were vaccinated, which indicates low vaccination practice among the respondents. knowledge, (AOR=1.69, 95% CI: 1.1, 2.56), threat (AOR= 1.24, 95% CI: 1.09, 1.4), and cues to action (AOR=1.86, 95% CI: 1.25, 2.76), were identified as independent predictors of HBV vaccination.

Conclusion: low vaccination practice was identified among the respondents. Knowledge, threat and cues to action remained independent predictors of HBV vaccination. Health education intervention that gives emphasis on HBM constructs that remained significant is crucial to increase the demand of HB vaccine.

Key words: HBV vaccination, practice, predictors, HBM, general population, Jigjiga, Eastern Ethiopia.

1. Introduction

1.1 Background

Hepatitis B is potentially life threatening infection caused by Hepatitis B virus (HBV), an enveloped virus containing partially double stranded, circular DNA genome and classified within the Hepadnavirus family. HBV infection can be either acute or chronic infection (1). Chronic Hepatitis B (CHB) can lead to liver failure, cirrhosis and hepatocellular carcinoma (HCC), which is the most common type of primary liver cancer (2).

HBV is highly contagious and can survive outside of the body for at least 7 days. The incubation period of HB is 75 days on average, but can vary from 30 to 180 days. The virus may be detected within 30 to 60 days after infection. The virus is transmitted through contact with the blood or other body fluids of infected persons (2).

In highly endemic areas, HB is most commonly spread from mother to child at birth (perinatal transmission), or through horizontal transmission (exposure to infected blood), especially from an infected child to an uninfected child during the first 5 years of life. The risk of chronicity of HB is inversely proportional to the age at which the infection is acquired. The chance of developing CHB is high among infants infected from their mothers or before the age of 5 years (2). The risk of CHB progression in to liver cirrhosis and hepatocellular carcinoma is associated with co-infection with HIV, HCV or HDV high consumption of alcohol, or exposure to afla-toxins and host factors (age >40years and longer duration of infection) (3). HBV is not curable. However, most of the time HBV infection in adult is self-limiting and followed by the development of natural immunity against the virus (4).

It is not likely, on clinical grounds, to distinguish HB from hepatitis caused by other viral agents and, hence laboratory confirmation of the diagnosis is an imperative. A vaccine against HB has been available since 1982. Many countries in the world administer HB vaccine that is 98%-100% effective in preventing the infection and development of chronic disease and liver cancer. The vaccine is given at birth or in early childhood to prevent the virus. In addition, those who are at risk and not immune should be offered HB vaccination (2). Beside the effective immunization

for HBV, the Infection rate can also be reduced through a modification of behavior and improving individual education (5).

1.2 Statement of the problem

Chronic Hepatitis B (CHB) is an important global public health problem and the most serious type of viral hepatitis. It is estimated that about 780,000 people die each year due to consequences of CHB, such as liver cirrhosis, and cancer. In 2015, an estimated 257 million persons were living with CHB infection in the world, The African and Western Pacific regions accounted for 68% of those infected with prevalence of 6.1% and 6.2% respectively (2). In sub-Saharan Africa, HBV infection is endemic and disease burden is high with 87,890 deaths annually (6). In Ethiopia, the prevalence of CHB infection is estimated to be 6.1% with variation across regions (7). In Somali region, the prevalence of HB among pregnant women was 6% and 9.48% among blood donors indicating intermediate and high prevalence of the disease in the region respectively (8,9).

CHB infection has a negative impact on health-related quality of life (HRQL) and Costs associated with CHB is important since it creates a significant economic burden to the health care services specially in resource limited settings where access to the diagnosis and treatment of HB remained inadequate (10,11,12). HIV co-infection adds considerably clinical burden, with an estimated 2.6 million HIV–HBV-co-infected individuals living in sub-Saharan Africa (13). HBV is 50 to 100 times more infectious than HIV (14). CHB could be a silent disease and only few of the infected peoples (10.5%) of them were aware of their infection and minority peoples diagnosed are on treatment designed to reduce onward transmission and disease progression (2).

There are global and local efforts to eliminate HBV. Locally the WHO global health sector strategy on viral hepatitis created in May, 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 in sub Saharan African countries, through effective prevention of new infections by universal implementation of the HBV birth-dose vaccine, full vaccine coverage, access to affordable diagnostics to identify HBV-infected individuals, and to enable linkage to care and antiviral therapy (13). It's difficult to achieve this ambitious strategy where there is lack of publicly funded adult HB vaccination and where HBV affects economically productive age group and

access and affordability for the diagnosis and treatment of HBV is low, accompanied with harmful traditional practices that favor the transmission of the diseases among the adult population. Therefore, increasing adult population HB vaccination has paramount importance in tackling the occurrence of the disease and transmission to infants. To design effective intervention that will increase the demand it's important to know predictors of HB vaccination practice among the general population. In Ethiopia there are studies conducted to assess HBV vaccination practice among HCWs, health science and medical students. However, there are limited studies in understanding predictors of HB vaccination practice. On the top of that, there are limited studies published in Ethiopia that assessed predictors of HB vaccination practice among the general population using HBM as theoretical framework. Therefore, the aim of this was to assess predictors of HBV vaccination practice among the general population of Jigjiga town, Eastern Ethiopia.

1.3 Significance of the study

Prevention is considered as one best way to safeguard populations' health, through prevention of diseases and its consequence, therefore this study aimed to assess predictors of HBV vaccination practice among the general population living in Jigjiga town using HBM. The finding of this study is important to:

- Establish baseline data
- Plan effective health education intervention that creates demand for HBV vaccine
- Inform decision makers to take action towards this highly contagious and deadly disease and
- Use as literature for other related researches.

2. Literature review

2.1 Global situation of HBV infection

Globally an estimated 257 million people are living with HBV infection defined as Hepatitis B surface antigen (HBsAg) positive. The prevalence of chronic HBV infection varies greatly in different part of the world. The prevalence of chronic HBV infection worldwide could be categorized as low (<2 %), intermediate (2–7 %), and high (≥8 %) endemicity. Hepatitis B prevalence is highest in the WHO Western Pacific Region and the WHO African Region, where 6.2% and 6.1% respectively of the adult population is infected. In the WHO Eastern Mediterranean Region, the WHO South-East Asia Region and the WHO European Region, an estimated 3.3%, 2.0% and 1.6%% of the general population is infected, respectively. 0.7% of the population of the WHO Region of the Americas is infected (2).

2.2 HBV infection situation in African countries

Prevalence of HBV in African countries was high with prevalence of 6.1% following Western Pacific Region (2). Most Africa countries were categorized as high or intermediate endemicity (HBsAg prevalence 5–7· 99%), or highly endemic for HBV (HBsAg prevalence ≥8%). in sub-Saharan African countries HBV infection is endemic and related disease burden is high. The lifetime risk of HBV infection is over 60% and more than 8% of the population remains chronic HBV carriers who are at risk of progressive liver disease and HCC (15). In recent report Ethiopian neighboring countries such as, Somalia, Djibouti and Sudan were categorized as high endemic countries with prevalence of HBsAg; 14.77%, 10.4% and 9.76% respectively, whereas Kenya and Ethiopia were categorized in the intermediate category with HBsAg prevalence of 5.16% and 6.1% respectively (7).

2.3 HBV infection situation in Ethiopia regions

HBV prevalence showed epidemiological variations across regions in Ethiopia with pooled prevalence of 7.4% in adult population (16). In addition, a recent report based on 18 studies in Ethiopia also reported prevalence of CHB to be 6.1 % (7). In Jigjiga town, the prevalence of HBV among pregnant women attending ANC clinic was 6% ,while the prevalence among blood donors was 9.48% which indicates the area to be in the range of intermediate to high endemic (8,9).

2.4 Hepatitis B Vaccine

HB is incurable that can lead to cirrhosis, liver cancer and death. However, a safe, effective vaccine has been available since the 1980s (2). HBV vaccines are composed of highly purified preparations of HBsAg. Early vaccines were prepared by harvesting HBsAg from the plasma of people with chronic infection (plasma derived vaccine) while more recent ones are obtained by expressing plasmids containing the corresponding gene in yeast or mammalian cells (recombinant DNA vaccine). Vaccination can help protect individuals and contribute to the elimination of this highly infectious disease. The HB vaccine stimulates the natural immune system to protect ones against the HBV. After the vaccine is given, the individual body makes antibodies that protect him against the virus. An antibody is a substance found in the blood that is produced in response to a virus invading the body. These antibodies will fight off the infection if an individual is exposed to the hepatitis B virus in the future (17).

HBV vaccine is recommended for all infants, all children and adolescents younger than 19 years of age who have not been vaccinated and peoples who are more at risk for the virus. Vaccine Protection lasts at least 20 years, or life-long (4). The vaccine is safe. However, some mild adverse events such as local pain, myalgia and transient fever, mostly within 24 hours can occur and these adverse effects are less common in children than adults. Severe adverse event like anaphylactic reactions are less likely to occur (17) the global reduction of HB is contributed by the vaccine as evidenced in many countries (7).

2.5 Previous studies

2.5.1 Knowledge about HBV

A study conducted among 780 healthy population of Quetta reported poor knowledge among respondents irrespective of their high awareness about HB. In this study, participants had poor knowledge on symptoms of HB, were majority of the respondents 67.7 % didn't know jaundice as common symptoms of HB and 79.1% of them also didn't know: nausea, vomiting and loss of appetite as common symptom of Hepatitis B. In addition, participants had poor knowledge on the transmission of HB, were only 10.1% of them knew unsafe sexual intercourse as mode of transmission (18).

Another study conducted in two rural regions of Cameroon identified poor knowledge about HB among the respondents. The participants had poor knowledge on questions related with: causative agents, symptoms, transmission and treatment of HB. However, majority of the participants were aware about HB vaccine and availability of diagnostic laboratory for HB (19).
Similar with the above studies, another study conducted among 176 pregnant women in beau health district, Cameroon identified poor knowledge among participant were majority of the participants had never heard of the disease called hepatitis and 80% of the participants did not know that HB to be a virus. 15.9 % of the participants knew that infection with HB can cause liver cancer. Majority of the respondents had poor knowledge on questions related with transmission of HB. In addition only 15.34 believed that HB vaccine prevents HB infection (20).

Furthermore, a study conducted in Nigeria among 335 traders reported low knowledge of HB among the participants. In this study, only 44% of them were aware about HB. Regarding complication of HB, 19% of the participants believed that HB can cause liver cancer. In modes of HB transmission, 52.7%, 57.8% and 62.6% reported sexual intercourse, sharp objects and blood transfusion as transmission modes of HB respectively. However, Most of the respondents 66% believed that HBV is treatable, and even a greater majority 72.6% responded that HB can be prevented by immunization (21). Moreover, a study conducted among Cambodian immigrants identified 64% of HB awareness among respondents. The majority of the respondents had poor knowledge regarding the modes of HB transmission. However, majority of the respondents were thought about liver cancer to be the complication of HB (22).

In contrast to the above studies, a study conducted in Arar Saudi Arabia among healthy population revealed good knowledge of the respondents. In this study, majority of the respondents 60.6% heard about HB and 64.8% said viral is the cause of HB. However only 39.2 % were thought HB can cause liver cancer. More than half of the respondents correctly answered questions related with transmission and common symptoms of HB were 60.6% of the respondents knew jaundice as symptom of HB and more than 75% of the respondents said HB can be transmitted by contaminated blood and un-sterilized syringes, needles, surgical instruments. In addition, 67.9 % said vaccine is available for HB. Most of the respondents 89.3% disagreed that Hepatitis B can be self-cured by body without medical treatment (23). Another study conducted among France in the general population found 96.1% of HB awareness among the respondents. Concerning transmission, 89.9% knew that HBV can be transmitted by needle-sharing during taking drugs, 79.1% knew correctly responded HB can occur during pregnancy and 69.7% correctly answered HB can occur during unprotected sexual intercourse (24).

2.5.2 Perception towards HBV infection

A study conducted among 1125 health professionals at Amhara national regional state found that around 63 % of study participants perceived not being at risk for HB (25). Another cross sectional study conducted to assess risk perception and knowledge of HB infection among cleaners in tertiary hospital of Nigeria identified; only 21.3% of high-risk perception towards HB among the respondents (26).

A cross sectional study conducted among 359 Vietnamese immigrant adults identified that low perceived susceptibility on average were participants did not think that they were at high risk for HBV and were not too worried about getting HBV or liver cancer. With respect to perceived severity, participants did think that being infected with HBV would change their lives, but they were somewhat unsure whether most people who were infected with HBV got liver cancer and died from it. With respect to perceived benefits, participants tended to endorse the belief that if they got HBV vaccine, they would not worry about liver disease, For barriers, participants reported a lack of knowledge about HBV infection, the belief that screening was unnecessary if they felt healthy, a lack of information about where to go for screening and vaccination language problems, and a fear of a positive result (27).

A study conducted in France reported negative perception regarding HB were less than 50% totally or mostly agreed that it is safe (28).

A study conducted among health workers in Iran found high risk perception about HB among the respondents in both their general and individual risk perceptions (29). Similar with this study, another descriptive cross sectional study conducted among 124 HCWs in Usmanu Danfodiyo University Teaching Hospital, Sokoto, Nigeria identified high risk perception among respondents were 92.7% of them perceived to be more at risk for HBV infection (30). A study conducted in Iran among pre marriage women also identified moderate perceived susceptibility and high perceived (severity, barriers, benefits and self-efficacy) among the participants (31).

2.5.3 Predictors of HBV

A cross sectional study conducted among 330 nurses in educational hospitals of Kermanshah city, Iran, using the HBM reported that; perceived threat, perceived self-efficacy, and cues to action to be more influential predictors of completing the three doses of HB vaccination (32).

Another cross sectional study based on the elements of the health belief model framework identified perceived susceptibility and knowledge level as predictors of HB vaccine acceptance while perceived severity was not remained as a predictor of HB vaccine acceptance (33).

According to the cross sectional study that employed HBM as theoretical framework to identify risk perceptions and barriers to HB screening and vaccination among Vietnamese Immigrants revealed in multiple logistic regression, perceived barriers as a predictors were its significantly negatively associated with vaccination behavior (27).

A cross study conducted among HCWs of Belgrade, Serbia identified in the multivariate adjusted model the following variables; occupation, duration of work experience, exposure to blood in the previous year, and total hepatitis B-related knowledge score as predictors of HBV vaccination (34).

Another study conducted among Vietnamese American College students found ; respondent's age, sex, years of US residency, ethnic self-identity, written and spoken Vietnamese language skills, and history of sexual intercourse as predictors of HBV vaccination. In addition to this the

study further identified; time spent with others with HBV, previous history of HBV screening, and HBV knowledge score as predictors of HBV vaccination (35).

2.5.4 HBV Vaccination practice

A study conducted among the rural community of Cameroon identified low vaccination practice toward HB were only 2.3% have been vaccinated against HBV (19). Another cross study conducted among healthy population of Quetta, Pakistan also identified low vaccination practice among the respondents were minority of the participants around 13.2% got vaccinated against HBV infection (18). Moreover, a cross sectional study conducted in tertiary hospital of Nigeria, to assess the risk perception and knowledge of hepatitis B infection among cleaners reported zero vaccination practice among the respondents against HB (26).

Contrary to the above studies, a study conducted among health population of Arar, Saudi Arabia, reported 44.7% vaccination practice (23). Another study conducted among French general population to asses Hepatitis B knowledge, perceptions and practices identified 47% HBV vaccination practice among the respondents (24).

2.6 Theoretical Framework of HBM

The HBM was one of the first models of health-promoting behaviors and it remains one of the most widely recognized conceptual frameworks of health behaviors. It is intrapersonal level theory of Health Behavior change that is developed in the early 1950s by social scientists Godfrey Hoch Baum, Irwin Rosenstock and Stephen Regels working in the United states (US) public health service at the U.S in order to understand the failure of people to adopt disease prevention strategies or screening tests for the early detection of disease. Later on uses of HBM were for patients' responses to symptoms and compliance with medical treatments (36, 37).

There are six constructs of the HBM. The first four constructs; perceived susceptibility, perceived severity, perceived benefits and perceived barriers were developed as the original view of the HBM whereas self-efficacy and cues to action were added after HBM research advanced and , it is supposed that individuals will take action to ward off, to screen for or to control ill health conditions if they regard themselves susceptible to the condition; if they believe it to have potentially serious consequences; if they believe that a course of action available to them would be beneficial in reducing either their susceptibility to, or severity of the condition and if they

believe that the anticipated barriers (or cost of) taking the action are outweighed by its benefits and if they are confident(self-efficacy) in practicing the recommended preventive health behavior (36).

2.7 Strength and Limitation of HBM

HBM has been useful in predicting and framing protective behaviors, its simplicity has enabled researchers to identify constructs that may be important, thus increasing the probability that a theoretical base was used to frame research interventions, But the HBM is limited, in that it is a cognitively based model and does not consider the emotional component of behavior and the relationship between risk and severity in forming threat is not always clear (37). In addition, it ignores social context of behaviors, since the theory focuses on individual. Furthermore, it does not account for environmental or economic factors that may prohibit or promote the recommended action. Moreover, it over simplifies behavior change and, there is a measurement difficulty in HBM (in testing scales) (36, 38).

Therefore there are few researches across the world that utilized Health Belief Model in predicating preventive behavior of HB and those employed showed that the importance of HBM in predicting HB preventive behavior (31, 32). An assessment of the literature indicated that limited published research on predictors of HB vaccination among the general population using Health Belief Model in Ethiopia. Moreover, all of the studies that employed HBM were conducted outside Africa especially in United States of America and Asia. The HBM which has demonstrated to be good in the application in the area of preventive health behavior is potentially seen as appropriate frame work for addressing health behavior related conditions like HBV. Knowing this Health belief constructs findings will help in designing Health Education intervention for increasing vaccine demand among adults.

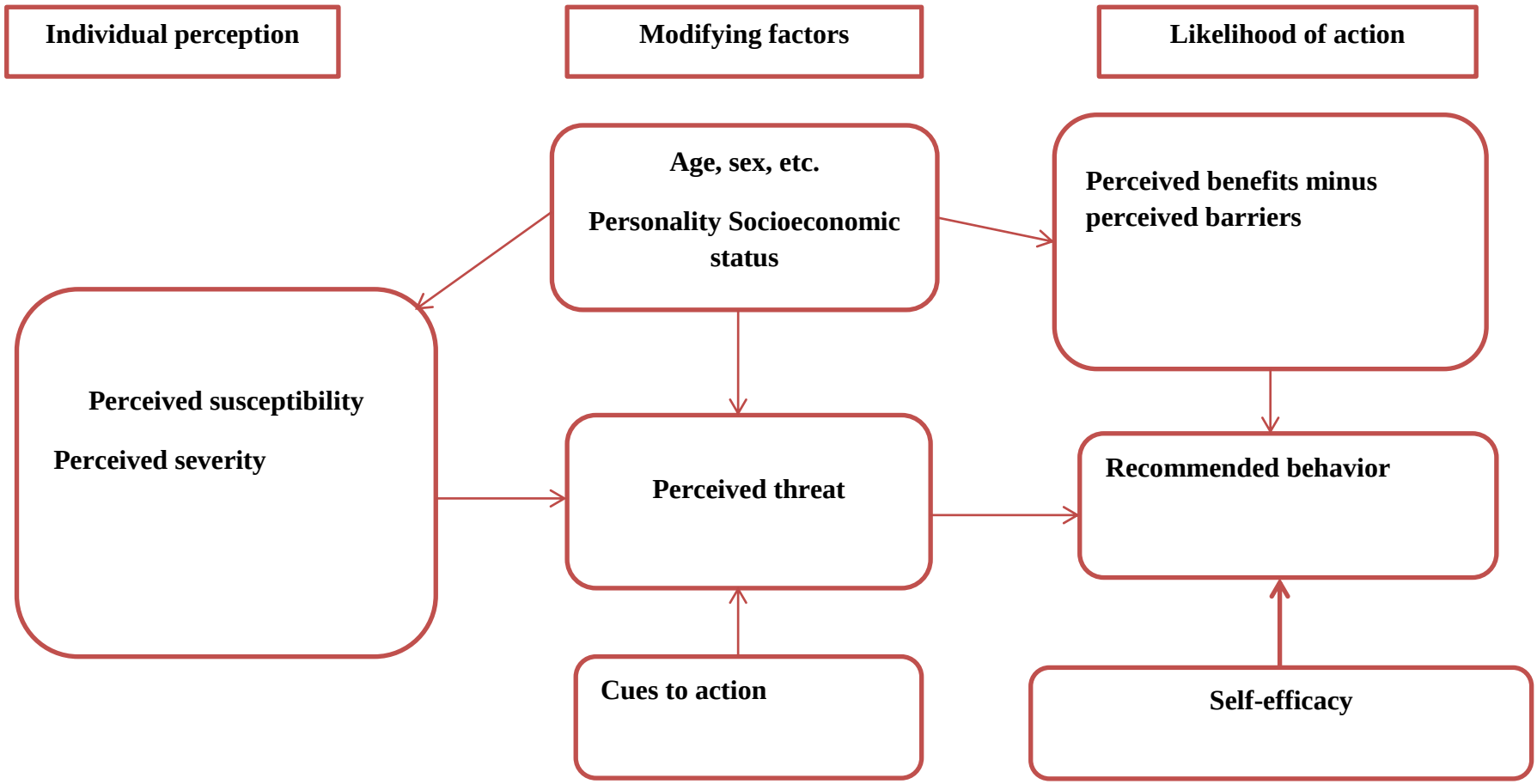

Figure 1: Theoretical framework of HBM (37)

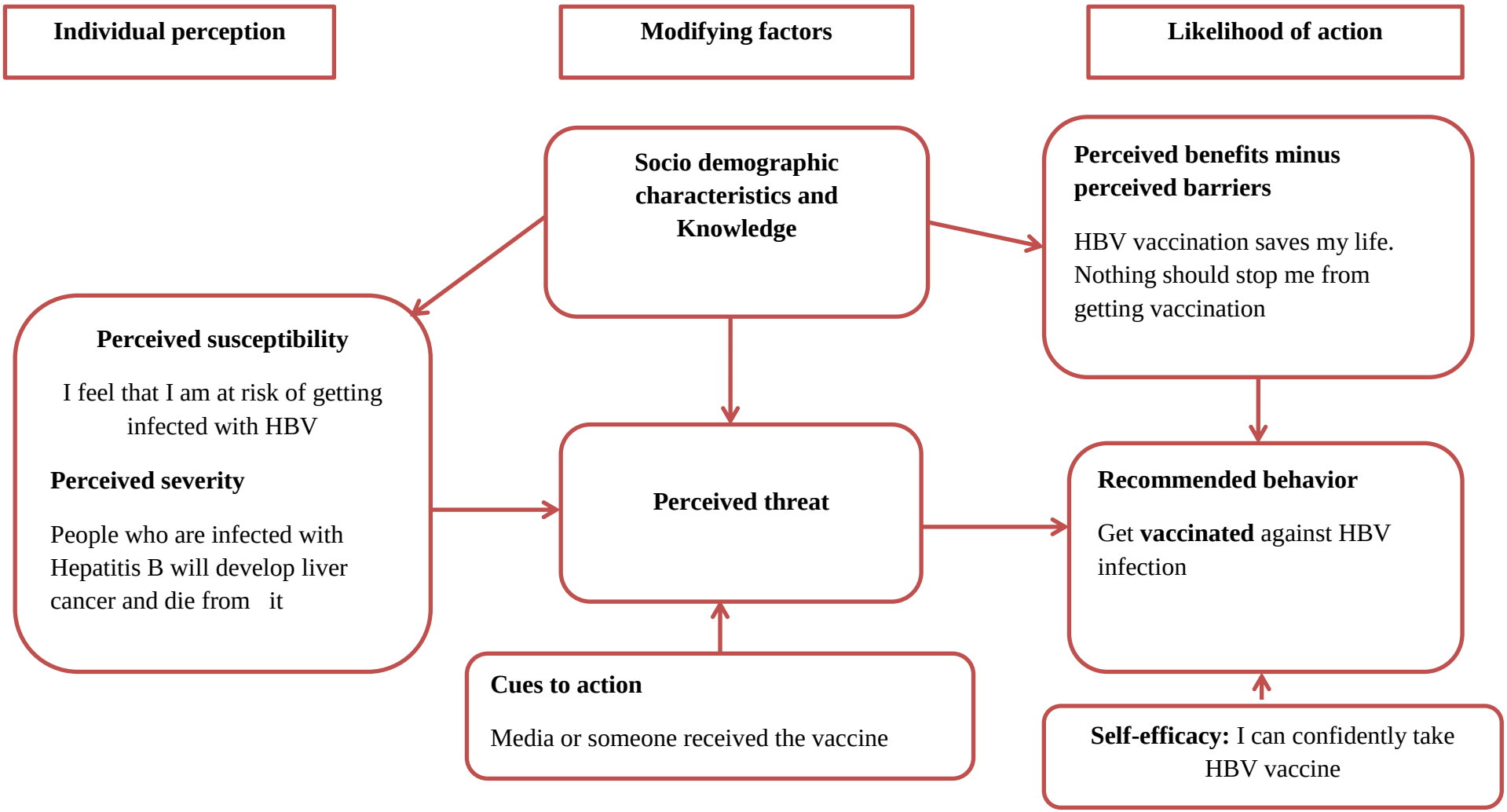

Figure 2: Conceptual framework developed by based on theoretical framework of HBM and modified (37)

3. Objectives

3.1 General objective

The general objective of this study was to assess predictors of HBV vaccination practice among the general Population of Jigjiga town using health belief model, 2019

3.2 Specific objectives

1. To assess knowledge about HBV infection among the general population of Jigjiga Town.
2. To asses perceptions on HBV infection among the general population of Jigjiga Town.
3. To assess HBV vaccination practice among the general population of Jigjiga Town.
4. To identify predictors of HBV vaccination practice among the general population of Jigjiga town.

4. Methodology

4.1 Study design

Community based cross- sectional study was conducted among general population of Jigjiga town.

4.2 Study area and period

The study was conducted from January 1 to 30, 2019, in Jigjiga town which is the capital city of Somali Region, Eastern Ethiopia. The town located 632 km east of Addis Ababa, the capital city of Ethiopia & 101KM east from Harar town. Jigjiga town had a total population of 277,560, (125,876 urban and 151,684 rural) (39). The town has 30 kebeles (the smallest administrative unit) of which 20 are urban and 10 are rural. Majority of the people were Somali ethnic and Muslim in religion. Their main source of income depends on small business, farming, livestock and other source of income like government employees. Jigjiga city has one Referral hospital, one Zonal hospital, three health centers, ten health posts, and 15 private clinics.

4.3 Population

4.3.1 Source population

Individuals within the thirty kebeles of Jigjiga town were the source population.

4.3.2 Study population

Individuals randomly selected within the selected three kebeles, who fulfilled the inclusion criteria were the study population.

4.4 Inclusion criteria

Individuals who were18 years and above, and not severely ill was included in the study

4.5 Sample size determination

The sample size was calculated by using Epi Info 7 software package based on single population proportion formula (with estimated proportion of 50%), margin of error 5% and a 95% confidence interval with 10% non-response rate.

$$n = \frac{(Z\ \alpha/2)^2\ P\ (1-P)}{d^2} = \frac{(1.96)^2\ 0.05(0.05)}{(0.05)^2} = 384$$

Where, n = sample size

p = estimated proportion of individuals get vaccinated (50%)

Z = standard normal distribution curve value for the

95% confidence interval (1.96)

d = the margin of error or accepted error = 5%

Accordingly the required sample size = (384 x10%) +384 = **422**

4.6. Sampling procedure

Jigjiga town was stratified into urban and rural kebeles, 2 Kebeles from urban and 1 kebeles from rural was selected by simple random sampling (lottery method). The sample was proportionally allocated for each selected kebeles based on their total number population. Systematic sampling was applied to select households until all sample size was reached. Lottery method was applied to select individuals within the household.

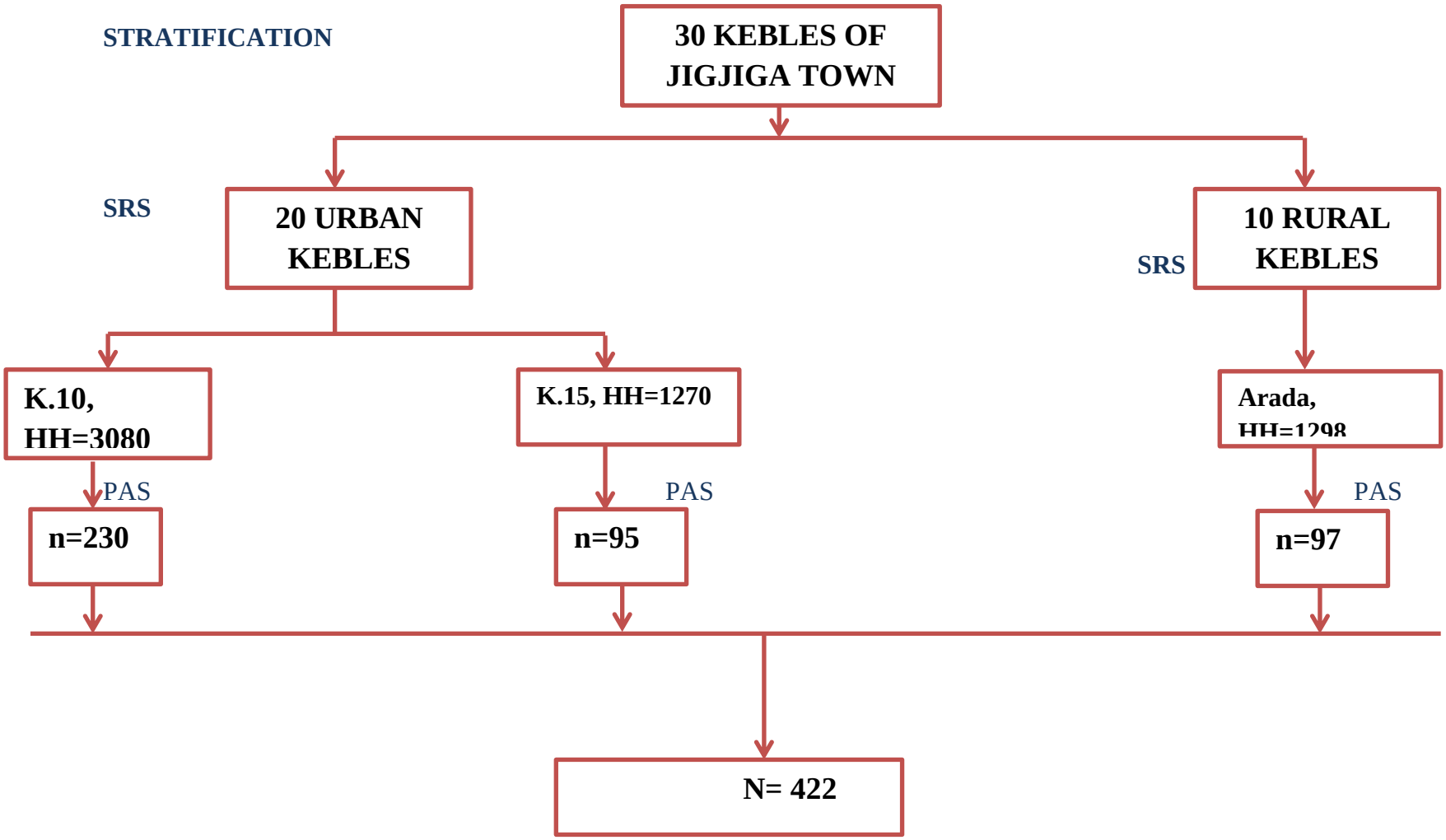

Figure 3: schematic presentation of sampling procedure for the study participants in Jigjiga town, Eastern Ethiopia, 2019

4.7 Data collection procedures

Data was collected using pretested structured questionnaire that was adapted and modified from previous studies (18, 19, 23, 31, 32). The questionnaire contains four parts; the first part is demographic variables such as age, educational level, occupation, income level, etc. (with 8 questions); the second part is knowledge about HBV infection with 16 questions and, the third part is HBM constructs with six sub-items including; perceived susceptibility with 4 questions, perceived severity with 5 questions, perceived benefits with 3 questions, perceived barriers with 4 questions, perceived self- efficacy and cue to action 2 questions for each. Items of HBM constructs was measured using five-point likert scale (strongly agree 5; through strongly disagree 1). The fourth part contains; HBV vaccination practice that contain (one question). Translated Somali version was used to collect data from respondents. Prior to data collection pretesting on 5% of sample drawn from unselected kebeles was conducted to assess clarity or understandability of the questions. The data collectors were eight experienced diploma holders: six nurse and 2 midwives. Two experienced supervisors, who were B.Sc holders in public health and, the principal investigator (PI), supervised the process of data collection. The data were collected from the selected individuals through face to face interview.

4.8 Data quality control

To ensure data quality, consistency was checked by translating the Somali version back in to English through health professionals who are fluent enough in both languages. Pre-test was undertaken on the questionnaire before the actual data collection to examine the simplicity, appropriateness, and consistency. The Cronbach's alpha coefficient was calculated to measure the internal consistency of the HBM constructs and knowledge items. two Experienced supervisors and eight data collectors were recruited and two day training were provided for the data collectors and supervisors on the objective of the study, contents of the questionnaires, how to maintain confidentiality and privacy of the study subjects. The collected data was checked by the supervisors and the PI on daily basis for any incompleteness and/or inconsistency. Correction was made by going back to the household (HH) for which incompleteness/inconsistency appeared. Every effort was made to include all households selected. Unoccupied houses during data collection were revisited in another day. When the house was permanently vacant,

occupants declined to participate, or the eligible individual was not available for interview after three times attempts, next closest household was visited but, refusal and break-off plus non-contacted and unknown eligibility were considered as non-response. Data was entered into EpiData entry client software package as part of data quality management. During data entry, frequency was run for each variable to identify error or missing data.

4.9 Operational definition

Knowledge: knowledge was assessed by questions focusing on HB etiology, sign and symptoms, transmission, and about vaccination and diagnosis. Each response was scored as 'yes' or 'no'. The scoring range of the questionnaire was 16 (maximum) to 0 (minimum). The Participants was given score 1, if they correctly answer knowledge question, and score 0, if they did not correctly answer the question. The knowledge items were summed up to had a composite score of total knowledge score that was treated as continuous variable. Those who have scored less composite score were considered to have poor knowledge and those who have scored high composite score were considered as having good/adequate knowledge.

The HBM constructs; Perceived susceptibility, Perceived severity, Perceived benefits, Perceived barriers, Cues to action, and Self- efficacy were measured by items for each constructs). The responses were rated on a five-point likert scale from strongly disagree to strongly agree. The response to the items in each constructs was added to attain a composite score reflecting the level of each constructs and the composite score for each constructs were treated as continuous variable. Based on that, those who have scored less composite score were considered to have low; Perceived susceptibility, Perceived severity, Perceived benefits, Perceived barriers, Cues to action, and Self- efficacy for the respective construct and those who scored high composite score were considered to have high; perceived susceptibility, Perceived severity, Perceived benefits, Perceived barriers, Cues to action, and Self- efficacy for their respective construct.

Practice:

Practices towards HB was assessed by asking; whether the participants took vaccination against HBV or not and the response was labeled with a score of 1 for those vaccinated while 0 was given for those not vaccinated.

4.10 Study variables

4.10.1 Independent variables

- Demographic variables such as; age, sex, educational level, income level, marital status, religion, ethnicity, residence and occupation.
- Knowledge
- HBM constructs**;** Perceived susceptibility, Perceived severity, perceived benefits, Perceived barriers, cues to action and self- efficacy.

4.10.2 Dependent variables

- HBV vaccination practice

4.11Data processing and analysis

Coded data was entered and cleaned using Epi Data entry client software package and analyzed using SPSS version 25.0. Descriptive and inferential statistics, such as percentages, frequencies, means, standard deviations and confidence intervals, were used to present the basic statistics in relation to the demographics, knowledge, health beliefs model constructs and vaccination practice. To measure the internal consistency of each independent variables; the reliability coefficient were calculated, in which the reliability coefficients (Cronbach's ά) of all the independent variables were found in the acceptable range ≥ 0.7 except for self-efficacy and cues to action constructs with Cronbach's ά of 0.44 and 0.423 respectively . The Logistic regression was used to determine the relationship between the outcome and each independent variable and those variables having P value of **<0.25** in binary logistic regression analysis were candidates for multivariable logistic regression analysis. Multivariable logistic regression, using the "Backward-elimination" method, was performed to identify the significant predictors for vaccination practice. Adjusted and unadjusted odds ratios (OR) and their 95% confidence intervals (CIs) was used as indicators of the strength of association. A p-value of 0.05 or less was used as cut off level for statistical significance.

4.12 Ethical considerations

The study protocol was approved by the Institutional Review Board (IRB) of Addis Ababa University, then official letter was written to the Somali region health bureau and permission was obtained from them. The objective of the study was explained to the study participants and verbal consent was obtained before interviewing each participant by explaining the benefits of the study. Fair selection of the study participants was considered in every step through random selection of the eligible participants. privacy and confidentiality of the study participants were maintained. Counseling was done after interview by providing them basic information, positive attitudes and safe practices which can prevent the spread of HBV infection. Study participants were given the rights to withdraw from the study at any time.

4.13 Dissemination of the results

The results of the study will be presented to the school of public health and concerned bodies. At the end, the forwarded comments, ideas and suggestions will be incorporated in the document and then it will be disseminated to concerned government offices: FMOH, Somali region Health Bureau, and NGOs working in health communication and behavior changes. Finally an attempt will be made to publish this study in health journal.

5. Result

5.1 Socio demographic characteristics of the respondents

A total of 405 participants agreed to participate in the interview resulted a response rate of 405(95.9%). Out of the 405, four questionnaires were discarded due to incompleteness. Therefore, 401 questionnaires were considered for the analysis. The median age of the respondents was 31 with IQR (28-50) years. Majority 286(71.3%) of the respondents were in the age groups of 28-27 years, followed by age groups 18-27 years. A little more than half 205(51.2%) of the respondents were female. Most of them 231(57.6%) were married, followed by 141(35.2%) single. Majority 217(57.2%) of the respondents have secondary school education and above. Majority of them were Somali ethnic (97.5%) and Muslim in religion (97.8%). More than two-third of respondents 315(78.6%) were urban residents. In relation to the occupational status, 113(28.2%) were housewife, and 95(23.7%) were employee. Majority of the respondents 298(74.3%) reported a monthly income of more 3000 ETB per month were their mean income was 7688.8+ 6802.8 (Table 1).

Table 1: Socio demographic characteristics of the respondents in Jigjiga town, Eastern Ethiopia, 2019

Variable	Category	Frequency	Percentage
Age	18-27	126	31.4
	28-37	160	39.9
	>38	115	28.7
Sex of the respondent	Male	196	48.9
	Female	205	51.1
Marital status of the respondents	Single	141	35.2
	Married	231	57.6
	Divorced/widowed	29	7.2
Religion	Muslim	392	97.8
	Orthodox	9	2.2

Ethnicity	Somali	391	97.5
	Others	10	2.5
Residence	Urban	315	78.6
	Rural	86	21.4
Occupation	Employee	95	23.7
	Business	70	17.5
	Farmer	7	1.7
	Student	69	17.2
	housewife	113	28.2
	Jobless	31	7.7
	other	16	4.0
Educational status	Illiterate	163	40.6
	primary school(1-8)	9	2.2
	secondary school (10-12)	72	18
	Diploma & above	157	39.2
Income of the respondents (ETB)	< 1000	40	10.0
	1000-2000	31	7.7
	2001-3000	32	8.0
	>30000	298	74.3

5.2 Knowledge of the respondents towards HBV infection

The overall reliability coefficient (Cronbach's alpha) of the HB knowledge questions was 0.71. The mean knowledge score was 10.43 ± 3.19 (out of 16 items) in the study. Out of the 401 participants, 20 % of the total participants never heard of HB, were 56.4 % agreed that HBV is a viral disease and 62.6 % of them said that HB can cause liver cancer. Out of the total surveyed respondents, majority of them 75.1% agreed that HB affects any age group. Most of the study participants had adequate knowledge on symptoms of HB; when they were asked about if jaundice is symptoms of HB, majority of the respondents 85% correctly responded and when they were asked about if nausea, vomiting and loss of appetite are common Symptom of HB, 70.4% correctly responded. However, when they were asked about, if HB disease causes no symptoms on some of the patients, more than half of them 61.4% didn't agreed. Poor knowledge was evident in question related with mode of HB transmission were, 53.3% of them didn't know that HB can be transmitted by using un-sterilized syringes, needles and surgical instruments and 54.5 % didn't know that HB can be transmitted by using blades of the barber/ear and nose piercing. In addition, significant number of respondents 48% didn't know that HB can be transmitted from mother to child during pregnancy and 37.1% of them didn't know that HBV can be transmitted through unsafe sex. However, majority of the respondents 93.1% agreed that contaminated blood can cause HB and majority of them 63.6% said that skin contact cannot cause HB. All most majority of the respondents were aware about availability of laboratory diagnosis and vaccination for HB. Majority, 73.5% participants said chronic hepatitis is a curable disease.

Table 2: Responses to HBV knowledge items among respondents of Jigjiga town, Eastern Ethiopia, 2019

Knowledge items	Correct N (%)	Not correct N (%)
1. Have you ever heard of a disease termed as HBV	321(80.0)	80(20.0)
2. Is Hepatitis B is a viral infection?	181(56.4)	140(43.6)
3. Can Hepatitis B cause liver Cancer?	201(62.6)	120(37.4)
4. Can Hepatitis B affect any age group?	241(75.1)	80(24.9)
5. Is jaundice common symptom of HBV?	273(85)	48(15)
6. Are nausea, vomiting and loss of appetite common Symptom of Hepatitis B?	226(70.4)	95(29.6)
7. Are there no symptoms of the Hepatitis B in some of the patients?	124(38.6)	197(61.4)
8. Can Hepatitis B be transmitted by un-sterilized syringes, needles and surgical instruments?	150(46.7)	171(53.3)
9. Can Hepatitis B be transmitted by contaminated blood	299(93.1)	22(6.9)
10. Can hepatitis B transmitted through skin contact	117(36.4)	204(63.6)
11. Can Hepatitis B be transmitted by using blades of the barber/ear and nose piercing?	146(45.5)	175(54.5)
12. Can Hepatitis B be transmitted by unsafe sex?	202(62.9)	119(37.1)
13. Can Hepatitis B be transmitted from mother to child?	167(52.0)	154(48)
14. Do you think that HBV has laboratory test	317(98.8)	4(1.2)
15. Is vaccination available for Hepatitis B?	216(67.3)	105(32.7)
16. Is CHB curable?	268(83.5)	53(16.5)

5.3 Perceptions of respondents towards HBV infection

Descriptive results of the six HBM constructs (Perceived susceptibility, severity, benefits, barriers, self-efficacy and cues to action) were described in **Table 3.**

Overall the perceived susceptibility was low with mean of 8.99 out of 20, were only 27. 8 % of the respondents perceived that they are at high risk for hepatitis B infection and 30.9 % of them worry about getting hepatitis B. Majority 69.2 % of the respondents believed that their chances of getting HBV infection is not high and only 14.6% of the respondents perceived that it is extremely likely that they would get HBV infection in the future.

The mean perceived severity score was 19.5 out of 25, which indicates a moderate to high perceived severity. A little more than half of the respondents 56.4 % perceived that People who are infected with Hepatitis B will develop liver cancer. The majority of the respondents 79.8 % of them agreed/strongly agreed with the statement ‘‘my whole life would change if I had Hepatitis B,’’ and 97.5% of them believed that HBV is a serious health problem. Regarding with the statement ‘‘if I get infected with HBV, my life was hopeless, 43% of the respondents strongly agreed and 8.4% agreed.

Concerning the perceived benefit the overall mean was 12.46 out of 15 which indicates high perceived benefit. For the statement ‘‘If I get a vaccine to prevent HB, I would not worry about liver disease and liver cancer’’, 20.2% and 43.9 % of the respondent agreed and strongly agreed respectively and 73.8 % believes that Vaccination is the best way to prevent liver cancer. Majority of the respondents 91 % of them agreed/strongly agreed that the benefits of getting HBV vaccine outweigh the costs.

The overall mean of perceived barriers was 9.39 out of 20. More than 50% of the respondents do not experienced barriers for having vaccination. For example; 52.7 % strongly disagreed/ disagreed with statement “I do not know where to go to get a vaccine for HB, 68.5 % strongly disagreed/ disagreed with statement ‘‘I don’t know the existence of vaccination for HB and 79.8 % of them strongly disagreed/ disagreed with statement ‘‘fears about the side effects of the vaccine prevents me to use the vaccine’’. In addition to this only 25.2% of the respondents believes that HB vaccination is not safe.

The overall mean of self-efficacy was 8.15 out of 10 reflecting respondents confidence to be more likely of taking the vaccine. About 95.6% of the respondents were confident in getting

information about HB and 64.8% were confident in receiving the three dose of HBV vaccination. In terms of cues to action the overall mean was 5.4 out of 10 indicating low cues to action among the respondents. The most commonly reported cues to action was ‘‘I recently heard about HB from radio or TV (television)” were 75.4 % of the strongly agreed/ agreed. However, the majority of the respondent 86.7% didn’t know someone who had HBV vaccination.

Table 3: Description of HBM constructs among respondents of Jigjiga town, Eastern Ethiopia, 2019.

Variable	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)
Perceived susceptibility					
1. I feel that I am at high risk for hepatitis B infection.	**48.3**	**19.3**	**4.7**	**9.7**	**18.1**
2. I worry a lot about getting hepatitis B	**43.9**	**22.1**	**3.1**	**9.7**	**21.2**
3. My chances of getting HBV infection is high	**45.8**	**23.4**	**13.7**	**6.9**	**10.3**
4. It is extremely likely that I will get HBV infection in the future	**34.3**	**21.5**	**29.9**	**8.7**	**5.9**
Perceived severity					
1. People who are infected with Hepatitis B will develop liver cancer.	**14.6**	**12.1**	**16.8**	**12.8**	**43.6**
2. My whole life would change if I had Hepatitis B	**6.5**	**12.8**	**0.9**	**15**	**64.8**
3. HBV is a serious health	**0.9**	**0.6**	**0.9**	**17.4**	**80.1**

problem.					
4. The thought of HBV scares me.	**16.5**	**13.4**	**1.2**	**16.5**	**52.3**
5. If I get infected with HBV, my life was hopeless	**27.4**	**18.1**	**3.1**	**8.4**	**43.0**
Perceived benefit					
1. If I get a vaccine to prevent Hepatitis B, I would not worry about liver disease and liver cancer	**6.2**	**13.1**	**16.5**	**20.2**	**43.9**
2. Vaccination is the best way to prevent liver cancer.	**15**	**7.5**	**13.7**	**19.3**	**54.5**
3. The benefits of getting HBV vaccine outweigh the costs	**1.6**	**2.8**	**14.7**	**23.7**	**67.3**
Perceived barriers					
1. "I do not know where to go to get a vaccine for HB."	**37.1**	**15.6**	**0.6**	**16.2**	**30.5**
2. I don't know the existence of vaccination for Hepatitis b	**46.4**	**22.1**	**0.6**	**13.1**	**17.8**
3. fears about the side effects of the vaccine prevents me to use the vaccine	**58.3**	**21.5**	**4.4**	**5.9**	**10.0**
4. I belief that the vaccine is not safe, it's dangerous	**47**	**14.6**	**13.1**	**12.1**	**13.1**
self-efficacy					
1. I can confidently get information about Hepatitis B	**1.2**	**2.8**	**0.3**	**33.6**	**62.0**
2. I can receive the three dose of HBV vaccination.	**13.1**	**20.6**	**1.6**	**19.9**	**44.9**

Cues to action

1. I know someone who have HBV vaccination	**83.2**	**3.4**	**0.00**	**1.2**	**12.1**
2. I recently heard HBV infection from radio/TV	**19.9**	**4.7**	**0.0**	**19.3**	**56.1**

Table 4: summary of HBM constructs

HBM construct	Total number of items	Mean	Standard deviation	Min	Max	Range	Cronbach's alpha
Perceived susceptibility	4	8.9969	4.33121	4	20	16.00	0.79
Perceived severity	5	19.49	4.808	7	25	18.00	0.716
Perceived benefit	3	12.46	2.795	3	15	12.00	0.77
Perceived barrier	4	9.39	4.505	4	20	16.00	0.713
Self-efficacy	2	8.15	1.931	2	10	8.00	0.44
Cues to action	2	5.43	2.340	2	10	8.00	0.423

5.4 vaccination practice and predictors of HBV vaccination

The overall vaccination practice among 321 respondents who heard about HBV was 17(5.3%). logistic regression analysis was done to identify predictors of being vaccinated. In Bivariate analysis among the socio demographic variables; only sex of the respondents was significantly associated with receiving vaccination at p-value <0.05. Accordingly male respondents were 3.25 times more likely to be vaccinated than female respondents with (P=0.043, COR=3.25, 95% CI (1.03, 10.2). knowledge score was significantly associated with being vaccinated in which for every unit increase in knowledge score the odds of being vaccinated increase by 2.34 times with (P<0.001, COR=2.34, 95%CI (1.6, 3.5).

The current study was based on the theoretical framework of HBM, which combines perceived severity and perceived susceptibility to produce threat that was finally used to predict the HB vaccination practice and subtracts total perceived benefit from total perceived barriers to get net benefit that predicts the HB vaccination practice together with perceived threat, self-efficacy and cues to action based on that, the present study identified: threat, net benefits and cues to action as significant predictors of being vaccinated at p-value <0.05 in bivariate analysis. Accordingly, for one unit increase in threat score, the odds of being vaccinated increases by 1.3 times and for one unit increase in net benefit score the odds of being vaccinated increases by 1.8 times with (P<0.001, COR=1.3, 95%CI (1.2, 1.5) and (P<0.001, COR=1.8, 95%CI (1.3, 2.5) respectively. Additionally, for cues to action constructs, for every one unit increase in cues to action score, the odds of being vaccinated increase by 2.37 times with (P<0.001, COR=2.37, 95%CI (1.7, 3.25) (Table5).

Table 5: Variables significantly associated with being vaccinated in bivariate logistic regression among respondents of Jigjiga town, 2019.

Variables	P- value	COR	95%CI
Age			
18-27 (ref)			
28-37	0.521	1.446	(0.47, 4.46)
>38	0.502	0.606	(0.14, 2.61)
Sex			
Female (ref)			
Male	0.043	3.25	(1.03, 10.2)
Marital status			
Single (ref)			
Ever married	0.949	0.97	(0.34, 2.69)
Residence			
Rural (ref)			
Urban	0.152	4.44	(0.57, 34.075)
Income	0.124	1	(1.00, 1.00)
Total knowledge score	<0.001	2.34	(1.6, 3.5)
Threat	<0.001	1.3	(1.2, 1.5)
Net benefit	<0.001	1.8	(1.3, 2.5)
Cues to action score	<0.001	2.37	(1.7, 3.25)

To identify predictors of HB vaccination practice, Multivariable logistic regression using adjusted odds ratio (AOR) and 95% confidence interval (CI) was used, were variables with p-value less ≤0.25 in bivariate analysis were included in the Multivariable analysis . Overall, the study model had a strong goodness of fit and overall classification accuracy of 96.9%. In addition the Nagelkerke R^2 of the model was 0.65(65% of the variance in the dependent variable is explained by the predictor variables).

In multivariable analysis: knowledge, threat and cues to action were remained as predictors of being vaccinated among the respondents with (P=0.014 AOR=1.69, 95%CI (1.1, 2.56), (P=0.001, AOR=1.24, 95%CI (1.091, 1.4) and (P=0.002, AOR=1.86, 95%CI (1.25, 2.76) respectively. However, sex of the respondents and net benefit that were significant in bivariate analysis, were not remained significant in multivariable analysis (Table 6).

Table 6: Variables significantly associated with HB vaccination practice in multivariable logistic regressions among respondents in Jigjiga town, 2019

Variables	COR(95%: CI)	AOR(95%:CI)
Total knowledge score	2.34 (1.6, 3.5)**	1.69 (1.1, 2.56)*
Threat	1.3 (1.2-1.5)**	1.24 (1.09, 1.408)*
Cues to action score	2.37(1.7-3.25)**	1.86 (1.25, 2.76)*
Net benefit	1.8(1.3, 2.5)**	1.15 (0.8, 1.67)
Sex		
Female(ref)		
Male	3.25(1.036, 10.2)	1.67 (0.273-10.314)
Residence		
Rural (ref)		
Urban	4.437(0.578, 34.075)	6.3 (0.374-105.308)
Income	1(1.00, 1.00)	1.000 (1.000 1.000)

Abbreviation: AOR: adjusted odds ratio, COR: crude odds ratio, CI: confidence interval to action

N.B: (*) indicates significance at P < 0.05, (**) indicates significance at P <0.001.

6. Discussion

Although HBV is deadly diseases, it can easily prevented by using HB vaccine. Knowing the best predictors of HBV vaccination will help in designing effective intervention. The current study was a population based survey to identify predictors of HBV vaccination practice among the general population of Jigjiga town using HBM as theoretical framework.

The results of this study revealed moderate knowledge about HB among the respondents. In the present study, 80 % of the total participants heard about HB. The probable reason for the high awareness in the current study may be due to the long history of the disease, its fatality and magnitude in the area. This finding is lower than finding of the study conducted among healthy population of Pakistan (18), and higher than the finding of the studies conducted in Nigeria (21), and Cameroon (20). Concerning complication of HB, 62.6 % said that it will cause liver cancer. This finding is in agreement with studies conducted among Cambodian immigrants were, majority of participants thought liver cancer as complication of HB (22), and contradicts, with a studies conducted in Saudi, Nigeria, and Pakistan (18,21,23). In the current finding, majority of the participants knew that HB can affect any individual regardless of their age. This finding agrees with the study conducted in Arar Saudi Arabia (23), and contradicts with study conducted in Pakistan (18). This difference may due to variation in participants and distribution of the disease in the different age groups in the study areas, because of the difference in the coverage and utilization of HBV vaccine. In the present study, participants had adequate knowledge on common symptoms of HB. Presence of high knowledge regarding the common symptoms of HB is important for the individual to seek early screening and treatment in order to prevent the complications of the disease and transmission to others. The probable reason for the existence of adequate knowledge in the common symptoms among respondents may be due to similarity in the symptoms of the five types of except jaundice which is common in hepatitis, gallstones and tumor hepatitis virus and the presence of these symptoms in most of the diseases. The finding of this study is consistent with study conducted in Arar Saudi Arabia (23), and contradicts, with studies conducted in Cameroon and Pakistan (18, 19). In the current study, most of the peoples didn't know the presence of asymptomatic peoples and this will increases the chance of transmission and leads peoples to develop chronic HB without knowing as they are infected.

Therefore, creating community level health education campaign and screening programs would help in early detection and preventing the development of CHB. This finding is somewhat comparable with Pakistan study (18), and contradicts with Saudi study (23).

Relating with the transmission of the disease, majority of the respondents had poor knowledge with the right transmission modes of HB. This low knowledge on the transmission modes of HB will further increase the burden of the diseases in the community and this finding is indication for the need of urgent prevention intervention. The finding of this study is in line with the studies conducted in Pakistan and Cameroon (18, 19) and contradicts with studies conducted in Saudi Arabia and France (23, 24). The reason for adequate knowledge on transmission of HB in Saudi and France studies may be due to their government efforts in the prevention of HB.

In the present study, the good news was most of the respondents knew that contaminated blood can cause HB. This finding is consistent with Saudi Arabia study (23), and contradicts with Cameroon and Pakistan studies (18, 19). In the current study, most of the respondents were aware about availability of the HB vaccine. The probable reason for the high awareness of HB vaccine may be due to the exposure of the community in to different media sources aired in Somali language and belief that most of the diseases have vaccination against it. This finding is consistent with different studies (18, 19, 23).

In this study, perceived susceptibility of the participants was low. The reason for this low perceived susceptibility in the present study may be due to the community culture of hiding being at risk for serious health problems to avoid discrimination related with the diseases and poor knowledge concerning the transmission of the disease. According to the HBM, individual who perceives that she/he is susceptible to HB and that HB is a serious health problem would be more likely to take preventive action like, taking HB vaccine. Similarly, individual who perceives more benefits of and fewer barriers to HB vaccine would be more likely to take the vaccine. The finding of this study, confirms the need of intervention to increase perceived susceptibility, in order to increase, HB vaccine demand among the adult population. This finding is in agreement with study conducted among health care workers in Bahardhar (25), contradicts with a study conducted among health care workers of Nigeria (30). The probable explanation for this difference may be due to the difference in the prevalence of the disease, or subjective nature of risk perception.

In present study, perceived severity score was a moderate to high among the respondents, were little more than half of the respondents believed that infected peoples with HB will develop liver cancer. Additionally, majority of the respondents believed that being infected with HB would change their life and the virus is a serious health problem. In this study, the moderate to high perceived severity is a good opportunity to promote HB vaccination practice in the community. This finding is in line with previous study conducted among pre-marriage women in Iran (31), and contradicts with a study conducted among Vietnamese immigrants (27). The probable explanation for this difference may be due to the low level of knowledge among Vietnamese immigrants about HB.

In the present study, participants had high perceived benefit of taking HB vaccine. More than 60% of the participants agreed importance of HB vaccination in preventing liver cancer and considered the vaccination as a best way in preventing liver cancer. In addition, more than 90% outweighed having HB vaccine than its cost. This high perceived benefit of the respondents is a good opportunity in increasing vaccine utilization among adult population, if fewer barriers and high perceived threat, accompanied with high self-efficacy and cues to action are realized according to the HBM. This study is in agreement with study conducted among the Vietnamese immigrants and pre-marriage women in Iran (27, 31). In contrast to the present study, negative perception towards HB vaccine benefit was identified in a study conducted in France (28). The most likely explanation for the difference may be variation of the study population.

In the present study, perceived barriers for not receiving HB vaccine among participants were low. The reason for these low barriers in receiving HB among the respondents may be due to high value given for personal health. This finding is in line with previous study conducted in Iran (32). In contrast to this, studies conducted among the Vietnamese immigrants and cleaners in Nigeria hospital reported significant barriers in receiving HB vaccine. The difference may be due the variance in the content of the questionnaire and measurement scale utilized.

In the present study self-efficacy score was high. This finding indicates that the likelihood of taking the vaccine will increase, since self-efficacy construct has direct link with outcome of the behavior in HBM. This study is in agreement with a study conducted among pre marriage

women in Iran (31). In relation to cues to action, the overall mean was 5.4 out of 10 indicating low cues to action among the respondents. The most commonly reported a cue to action was ‘‘I recently heard about HBV infection from Radio/TV were 75.4 % of them agreed. The reason why radio/TV remained commonly reported cues to action is that, the community routinely uses Radio/TV as source of information and there are many health programs aired in Somali languages through Radio/TV in the different countries the Somali ethnic resides. This finding is higher than a study conducted among health care workers in Broujen, Iran, were 66.7% reported that they had heard or seen about HB on radio or television programs (29). This difference may be due to the fact that source of information is different between health professionals and the general population.

In spite of high awareness in the availability of HBV vaccine, low perceived barrier and high (perceived severity, perceived benefit, and self-efficacy), the present study revealed low vaccination practice among the respondents were only ,17(5.3%) of them reported vaccination against HB. The probable reason for this low vaccination practice may be due to their low perceived susceptibility towards HB. The finding of this study is to some extent comparable with studies conducted in Cameroon, and Vietnamese immigrants (19, 27), and lower than findings of studies conducted in Pakistan, Saudi Arabia and Nigeria (18, 21, 23).

In multivariable logistic regression, the results demonstrated that knowledge, threat and cues to action as predictors of being vaccinated. However, other components of HBM (net benefit, self-efficacy) and socio demographic factors not predicted vaccination practice. Different studies have been reported various results about independent predictors of HB vaccination practice. In consistent with the current study, a study conducted in Iran identified; perceived threat, and cues to action as the most influential predictors of doing complete vaccination. However, unlike the current study, self-efficacy was also mentioned as predictor of doing complete vaccination (32). Another previous study that utilized HBM constructs also reported; perceived susceptibility and knowledge level as predictors of HB vaccine acceptance, while perceived severity not remained as predictor of vaccine acceptance in this study (33). In agreement with the present study, a study conducted among HCWs of Serbia identified; total knowledge score to be predictor of HB vaccination among the HCWs (34). A study conducted among Vietnamese immigrants also

identified barrier as predictor of HB vaccination which contradicts the current finding (27). However, the current findings treated perceived barriers and perceived benefits as net benefit in multi logistic regression analysis, so that it's difficult to make comparison in this scenario.

7. Strength and Limitation of the study

7.1 Study limitation

The study limitations should be taken into consideration in using the results. First, the internal consistency of the questionnaire was relatively low 0.44 and 0.423 for assessing self-efficacy and cues to action constructs respectively. Reverse causality is common limitation in HBM. In addition, the vaccination practice data were based on self-reports, which may be subject recall bias. Furthermore, due to the non-experimental nature of the study, it's not possible to establish causal inferences.

7.2 Strength of the study

The strength of this study is inclusion of all the six constructs of HBM to predict vaccination practice and consideration of both rural and urban settings.

8. Conclusion and Recommendations

8.1 conclusion

In conclusion the current survey identified moderate HBV knowledge among respondents. Additionally, Majority of the people had high (perceived severity, benefit, self-efficacy), with low perceived barriers. However, low perceived susceptibility and cues to action were identified among the respondents. Total Knowledge score, perceived threat and cues to action remained significant predictors of vaccination against HBV. Participants were aware about the availability of HB vaccine and reported low perceived barriers. However, the study found low vaccination practice against HB. Therefore, in the light of this result it is important to run community-based, culturally appropriate extensive health education program based on HBM constructs with the focus of predictors of HB vaccination practice to prevent further spreading of HBV infection within the community.

8.2 Recommendation

- FMOH and RHBs should have to give more emphasis on prevention of HBV among adult population.
- Policy makers should have to develop strategies for HBV prevention.
- Researchers should have to conduct further researches on vaccination behavior of the general population and their willingness to pay for vaccination. In addition validation of the tool is important for the validity of the results.

9. Reference

1. Guidelines for the prevention, care and treatment of persons with chronic hepatitis b infection. Geneva,: WHO; 2015.
2. World Health Organization. Fact sheet on hepatitis B. Geneva; 2018.
3. Maclachlan JH, Cowie BC. Hepatitis B Virus Epidemiology. CSH perspect Med. 2015;1–12.
4. States M, Strategic WHO, Group A, Grade T, Sage T. Weekly epidemiological record Relevé épidémiologique hebdomadaire. Switzerland; 2017 Jul 7;369–92.
5. Franco E, Meleleo C, Serino L, Sorbara D, Zaratti L. Hepatitis A : Epidemiology and prevention in developing countries. 2012;4(3):68–73.
6. World Health Organization. Global hepatitis report, 2017. Geneva,; 2017.
7. Schweitzer A, Horn J, Mikolajczyk RT, Krause G, Ott JJ. Articles Estimations of worldwide prevalence of chronic hepatitis B virus infection : a systematic review of data published between 1965 and 2013. Lancet. 2015;6736(15):1–10.
8. Negussie A, Beyene E. Seroprevalence of Hepatitis B Surface Antigenemia among Pregnant Women Attending Antenatal Clinic in Jigjiga, East Ethiopia: A Cross-Sectional Study. IJRR. 2016;3(February):1–7.
9. Abate M, Wolde T. Seroprevalence of Human Immunodeficiency Virus , Hepatitis B Virus , Hepatitis C Virus , and Syphilis among Blood Donors at Jigjiga. EJHS. 2016;26, No. 2:1–8.
10. Bane A, Patil A, Khatib M. Healthcare cost and access to care for viral hepatitis in Ethiopia. 2014;9(4):1718–23.
11. Gujral H, Collantes RS. Understanding viral hepatitis: A guide for primary care. The Nurse Practitioner.2009 Dec 1; 34(12):23-31.
12. Leung CM, Wong WH, Chan KH, Lai LSW, Luk YW, Lai JY, et al. Public awareness of hepatitis B infection: A population-based telephone survey in Hong Kong. Hong Kong Med J. 2010;16(6):463–9.
13. Spearman CW, Afihene M, Ally R, Apica B, Awuku Y, Cunha L, et al. Hepatitis B in sub-Saharan Africa: strategies to achieve the 2030 elimination targets. Lancet Gastroenterol Hepatol [Internet]. Elsevier Ltd; 2017;2(12):2121. Available from: http://dx.doi.org/10.1016/S2468-1253(17)30295-9

14. Tsega E. Epidemiology, prevention and treatment of viral hepatitis with emphasis on new developments. Ethiopian Medical Journal.2000 Apr; 38(2):131-41

15. Howell J, Ladep G, Lemoine M, Thursz MR, Taylor-robinson SD. Hepatitis B in Sub-Saharan Africa. SSMJ. Vol 7:59–61.

16. Belyhun Y, Maier M, Mulu A, Diro E, Liebert UG. Hepatitis viruses in Ethiopia : a systematic review and meta-analysis. BMC Infect Dis [Internet]. BMC Infectious Diseases; 2016;1–14. Available from: http://dx.doi.org/10.1186/s12879-016-2090-1

17. World Health Organization. information fact sheet. Geneva,; 2012.

18. Haq N, Hassali MA, Shafie AA, Saleem F, Farooqui M. A cross sectional assessment of knowledge , attitude and practice towards Hepatitis B among healthy population of Quetta , Pakistan. BMC Public Health [Internet]. BMC Public Health; 2012;12(1):1. Available from: BMC Public Health

19. Abongwa LE, Sunjo NS, Afah NG. Assessment of Knowledge , Attitude and Practice towards Hepatitis B among two rural communities of the Anglophone regions in Cameroon. Int J Appl Sci [Internet]. 2016;04(03):490–505. Available from: http://research-advances.org/index.php/IRAJAS%0AAssessment

20. Frambo AAB, Atashili J, Fon PN, Ndumbe PM. Prevalence of HBsAg and knowledge about hepatitis B in pregnancy in the Buea Health District , Cameroon : a cross-sectional study. BMC [Internet]. 2014;7(1):1–7. Available from: http://www.biomedcentral.com/1756-0500/7/394

21. Article O. Knowledge of Hepatitis B Virus Infection Among Traders. NJCP [Internet]. 2017;20(4):415–20. Available from: 10.4103/1119-3077.204404

22. Vicky M. Taylor, Seng P, Acorda E, Sawn L LL. Hepatitis B knowldge and practices among combodian immigrants. J Cancer Educ. 2010;24(2):100–4.

23. El-fetoh NMA, Thaib R, Alenzi R, Ghabban KM. A Cross Sectional Assessment of Knowledge , Attitude and Practice Towards Hepatitis B among Healthy Population of Arar , Saudi Arabia. Merit Res Journals. 2017;5(3):156–64.

24. Brouard C, Gautier A, Saboni L, Jestin C, Semaille C, Beltzer N. Hepatitis B knowledge , perceptions and practices in the French general population : the room for improvement. BMC Public Health. 2013;1–10.

25. Feleke BE. Low coverage of hepatitis B vaccine and determinants among health professionals working in Amhara regional state hospitals , Ethiopia. JPH. 2016;7(553):53.

26. Abiodun O, Shobowale O, Elikwu C, Ogbaro D, Omotosho A, Mark B, et al. Risk perception and knowledge of hepatitis B infection among cleaners in a tertiary hospital in Nigeria : A cross-sectional study. Clin Epidemiol Glob Heal [Internet]. INDIACLEN; 2019;7(1):11–6. Available from: https://doi.org/10.1016/j.cegh.2017.12.001

27. Toubbeh J, Tan ÆY, Siu ÆP. Risk Perceptions and Barriers to Hepatitis B Screening and Vaccination among Vietnamese Immigrants. JIMH. 2007;213–20.

28. Moyroud L, Hustache S, Goirand L, Hauzanneau M, Epaulard O. Negative perceptions of hepatitis B vaccination among attendees of an urban free testing center for sexually transmitted infections in France. Hum Vaccin Immunother [Internet]. Taylor & Francis; 2017;13(5):998–1004. Available from: http://dx.doi.org/10.1080/21645515.2016.1264549

29. Morowatishaifabad M, Javad M, Sakhvidi Z, Gholianavval M, Boroujeni DM, Alavijeh MM. Predictors of Hepatitis B Preventive Behavioral Intentions in Healthcare Workers. Saf Health Work [Internet]. Elsevier Ltd; 2015;6(2):139–42. Available from: http://dx.doi.org/10.1016/j.shaw.2014.12.001

30. Length F. Knowledge , risk perception and hepatitis B vaccination status of healthcare workers in Usmanu Danfodiyo University Teaching Hospital , Sokoto , Nigeria. J public Heal Epidemilogy. 2016;8(April):53–9.

31. Raoofi A, Hatefnia E, Kazemnejad A, Alavian SM. Health beliefs in hepatitis B vaccination among pre-marriage women. Biomed Res-India. 2016;27(1):116–22.

32. Alavijeh MM, Vaezi M, Jalilian F. Hepatitis B Vaccine Acceptability among Nurses : A Theory Based Conceptualization. Iran Assoc Gastroenterol Hepatol [Internet]. 2019;11(1):45–51. Available from: https://doi.org/10.15171/mejdd.2018.127

33. Al-hussami M. Knowledge And Acceptance Of Hepatitis B Vaccine. IJHcA. 2001;2(1):1–41.

34. Kanazir M, Gazibara T, Maric G, Makismovic N, Loncarevic G, Pekmezovic T. Predictors of hepatitis B vaccination status in healthcare workers in Belgrade , Serbia , December 2015. 2017;16(December 2015):0–8.

35. Street M, Edd CH, Treatment A, Care E, Edd CH. Journal of American College Health. JACH. 2010;56(February 2015):37–41.

36. Barr E. Chapter three, Theory in Health Promotion Programs. PPT lecture presented at university of North Carolina, Florida. 29, August, 2012.

37. Glanz K, Rimer BK, Viswanath K, editors. Health behavior and health education: theory, research, and practice. John Wiley & Sons; 2008 Aug 28.

38. Yarbrough SS, Braden CJ. Utility of health belief model as a guide for explaining or predicting breast cancer screening behaviours. Journal of advanced nursing. 2001 Mar 13; 33(5):677-88.

39. Central Statistical Agency of Ethiopia .Population and housing census of Ethiopia: Addis Ababa; CSA, 2007.

Annex I: Chi-square test to see the relationship between categorical independent variables with the outcome variable (vaccination practice) among respondents of Jigjiga town, 2019

Independent categorical variable	HB Vaccination		X^2	df	p-value
	Yes	No			
Age					
18-27	5	94			
28-37	9	117	1.771	2	0.413
>38	3	3			
Sex					
Female	13	152	4.516	1	0.034
Male	4	152			
Marital status					
Single	6	105	0.004	1	0.949
Ever married	11	199			
Residence					
Rural	1	66	2.442	1	0.215
Urban	16	238			
Educational status					
Illiterate	0	117			
Primary	0	3	20.983	3	<0.001
Secondary	0	53			
Diploma and above	17	131			

Occupation					
Student	2	55			
Employed	15	77	32.2	2	<0.001
Others	0	172			
Income					
< 1000	2	75			
1000-2000	1	85			
2001-3000	3	51	9.837	3	0.017
>30000	11	93			

Annex II: study information sheet (English version)

Title of the study: predictors of HBV vaccination practice among the general population of Jigjiga town, Eastern Ethiopia, 2019: Application of Health Belief model.

Objective: The main objective of this study is to assess predictors of HBV vaccination practice among the general population of Jigjiga town, Eastern Ethiopia, 2019

Study procedures: The study was conducted using structured interviewer-administered questionnaire among the randomly selected participants.

Benefit of the study: there is no direct benefit. However, the result of the study was helpful in identifying predictors of HBV vaccination practice to increase demand of the HB vaccine which helps in preventing HBV infection.

Risk of the study: there was no risk or harm associated in this study.

Confidentiality: the information collected from each participant was kept secret and privacy of the study participants were maintained during data collection.

Rights of participation (Voluntary Participation): each participant had the right to fully understand the objectives and methods of this study and to refuse his/her consent of participation

Termination of the study: in this study the participant were allowed to withdraw from the study at any time

Institution: Addis Ababa University School of public health.

Name of sponsoring organization: Jigjiga University

Principal Investigator: Ahmednasir Abdi (BSc.)

Mobile: +251 915154773

E-mail: jimcale942@gmail.com

Advisor: Mirgissa Kaba (**MA, PhD**)

Co- Advisor: Eyob Feyissa (**MD, MPH**)

Annex III: Informed consent (English version)

Good morning/good afternoon. My name is …….. I came from…….. I am working for an investigator doing his thesis for the partial fulfillment of master's degree in Public Health.

The following information describes the research study in which you are being asked participate. Please listen to the information carefully. At the end, you will be asked whether you participate in the study or not. The purpose of this study is to identify factors associated with HBV vaccination practice among the general population living in Jigjiga town. If you agree to participate in this study, the interviewer will ask you a list of questions and the interview will take approximately 30-40 minutes, and your correct answer to the questions can make the study to achieve the goals. We do not anticipate that you will experience any personal risk or discomfort from taking part of this study. You may skip any question if you do not wish to answer. No benefit can be promised to you from your participation in this study. The study is expected to benefit society by teaching us about the factors associated with Hepatitis B virus prevention behavior. Your answers will be confidential and your name will not appear in any document. The questionnaire and the informed consents will be secured. You will not be paid for your participation in this study and your participation in this study is voluntary and you are free to refuse to participate in the study or withdraw your consent at any time during the study.

Do you have any question? Are you willing to participate in the interview?

If Yes, Go to the next page If No, Thank them and interrupt the interview

Name and Sign of the consenting interviewer…….

Result of the interview: 1. Completed 2.Partially completed 3. The interviewee refused 4. Other……

Supervisor's name…….. sign …….. Time interview started …….

Time interview Finished……

Date……

Annex IV: Questionnaire (English Version)

Code	Socio demographic characteristics	Alternative response
101	What is your age	……..
102	Sex	1. Male 2. Female
103	Marital status	1. single 2. married 3. divorced/widowed
104	Religion	1. Muslim 2. orthodox 3. protestant 4. catholic 5. Others specify…….
105	Ethnicity	1. Somali 2. Amhara 3. Oromo 4. Others specify……..
106	Occupation	1. employee 2. business 3. farmer 4. student 5. housewife 6. jobless 7. others
107	Educational status	1. illiterate 2. primary school(1-8 grade) 3. secondary school (10-12grade) 4. diploma and above
108	Income	……ETB

Code	Questions on knowledge part	Alternative response	Skip
201	Have you ever heard of a disease termed as Hepatitis B?	1. Yes 2. No	If the answer is No for Q-201 skip All the questions
202	Is Hepatitis B a viral infection?	1. Yes 2. No	
203	Can Hepatitis B cause liver Cancer?	1. Yes 2. No	
204	Can Hepatitis B affect any age group?	1. Yes 2. No	
205	Is jaundice common symptom of HBV?	1. Yes 2. No	
206	Are nausea, vomiting and loss of appetite common Symptom of Hepatitis B?	1. Yes 2. No	
207	Are there no symptoms of the Hepatitis B in some of the patients?	1. Yes 2. No	
208	Can Hepatitis B be transmitted by un-sterilized syringes, needles and surgical instruments?	1. Yes 2. No	
209	Can Hepatitis B be transmitted by contaminated blood	1. Yes 2. No	
210	Can hepatitis B transmitted through skin contact	1. Yes 2. No	
211	Can Hepatitis B be transmitted by using blades of the barber/ear and nose piercing?	1. Yes 2. No	
212	Can Hepatitis B be transmitted by unsafe sex?	1. Yes 2. No	
213	Can Hepatitis B be transmitted from mother to child?	1. Yes 2. No	
214	Do you think that HBV has laboratory test?	1. Yes 2. No	
215	Is vaccination available for Hepatitis B?	1. Yes 2. No	
216	Is Hepatitis B curable / treatable?	1. Yes 2. No	

Health Belief Model constructs	Code	Questions on HBM constructs	Alternative response				
			Strongly disagree (1)	Disagree(2)	Neutral (3)	Agree(4)	Strongly Agree(5)
Perceived susceptibility	301	I feel that I am at high risk for hepatitis B infection.					
	302	I worry a lot about getting hepatitis B,					
	303	My chances of getting HBV infection is high					
	304	It is extremely likely that I will get HBV infection in the future					
Perceived severity	305	People who are infected with Hepatitis B will develop liver cancer.					
	306	My whole life would change if I had Hepatitis B					
	307	HBV is a serious health problem.					
	308	The thought of HBV scares me.					
	309	If I get infected with HBV, my life will be hopeless					
Perceived benefits	310	If I get a vaccine to prevent Hepatitis B, I would not worry about liver disease and liver cancer					
	311	Vaccination is the best way to prevent liver cancer.					
	312	The benefits of getting HBV vaccine outweigh the costs					
Perceived barriers	313	"I do not know where to go to get a vaccine for Hep B."					
	314	I don't know the existence of vaccination for Hepatitis b					
	315	Having HBV vaccination would					

		cost too much money.					
	316	fears about the side effects of the vaccine prevents me to use the vaccine					
	317	I belief that the vaccine is not safe, its dangerous					
Self- efficacy	318	I can confidently get information about Hepatitis B					
	319	I can receive the three dose of HBV vaccination.					
Cues to action	320	I know someone who have HBV vaccination					
	321	I recently heard about about HBV infection from Radio/TV					

Code	Question for practice part	Alternative response
401	Have you been vaccinated against HBV?	1. Yes 2. No

Annex V: Study Information Sheet (Somali Version)

xaashida macluumaadka

Ujeedada daraasaadka: waa in la ogaado arrimaha la xidhiidha ka hortaga xanuunka cagaarshowga dad weynaha ku nool magaalada jigjiga.

Faa'iidada daraasaadka: wax faa'iido toos ah oo shaqsi ahaan ah malaha daraaasaadkan lakin wuxuu faa'iido u noqon doona mustqabalka dad weyanaha ku nool deegaanka.

Halista daraasaadka: daraasaadkan ka qaybgalkiisu malaha wax dhib ama halis ah.

Xuquuqda ka qayb galayaasha daraasaadka: ka qaybgalayasha daraasaadkan waxay xaq u leeyihiin inay go'aanka ka qayb galka ama inayna ka qaybgalin yeeshaan.

Jaamacada daraasaadka samaynaysa: Addis Ababa University

Jaamacada bixinaysa dhaqaalaha daraasaadka: Jigjiga University

Baadhaha Daraasaadka : Axmednasir cabdi (BSc)

Taleefanka: +251 915154773

Imeelka: jimcale942@gmail.com

La taliyaha koobaad: Mirgissa Kaba (**MA, PhD**)

La taliyaha labaad: Eyob Feyissa (**MD, MPH**)

Annex VI: Informed consent (Somali version)

xog oggalaansho la wergaliyey

Subax wanaagsan /galab wanaagsan. Magacaygu waa …….... waxaan ka imid …….. waxaan u shaqaynaya arday dhigta jaamacaddaa addis ababa samaynayana daraasaad uu ku qaadanayo shahadada master ka loo yaqaano ee caafimaadka bulsahda .

Xogtan hoos ku qeexan waxay ku saabsantahay daraasaaadkan lagaa codsanayo inaad ka qaybgashid. Si fiican u dhagayso maadamo marka danbe lagu waydiin doono inaad raali ka tahay inaad ka qaybgashid ama inaadan raali ka ahayn. Ujeedada daraasadkan waa in lagu garto qodobbada la xiriira tallaalka HBV(cagaarshowga cad ee dhiiga raaca) ee dadka ku nool magaalada. Haddii aad raali ka tahay inaad ka qaybgasho daraasaadkan, sualaha lagu waydiin doona waxay qaadan ila iyo 40 daqiiqo, qofka ku waraysanaya wuxuu ku waydiin doona su'aalo dhowr ah. Jawaabta saxsan ee aad na sisid daraasadka waxay uu tahay inuu hadafkisa gaadho. Wax dhibaato ah oo kasoo gaadahysa daraasaadkan majirto. Su'aasha aadan rabin inaad ka jawaabto waad ka boodi karta. Wax lacag ah oo aad daraasaadkan ka helaysa majirto. Daraasaadkani wuxuu uu faa'idayn doona bulsahda. Waxaad noogu jawaabtid oo dhan waa noo sir qof kale na ma ogaaan karo. Wax magacaaga ah oo aanu meel ku qorayna majiro. Ka qaybgalka darasaadkani waxaad uu tahay xor wadan diidi karta inaadan ka qaybgalin. Wakhtiga aad rabtidna waa ka joogsan karta daraasaadkan .

Wax su'aal ah ma qabta? Raali ma ka tahay in lagu waraysto?

Haddii haa, waydi su'aalaha haddii maya , uu mahad celi, jooji waraysiga …aad guri kale

Saxiixa qofka waraysanaya…….

Natiijada waraysiga: 1. Dhammeystiran 2.ana dhammeystiran 3. ma oggalaan in la waraysto 4. Natiijo kale sheeg ……

Magaca kormeeraha …… saxiixa …….. waxkhtigu waraysigu bilaabmay……. Wakhtigu dhammaaday waraysigu

Taarikhda waraysiga…….

Annex VII: Questionnaire (Somali Version)

Sumaddaa	Su'aalaha ku saabsan xogta guud ee shaqsiga.	Jawaabta
101	Da'da	……..
102	jinsi	1.Dumar 2.lab
103	Guurka	1.Aana guursan 2.Guursaday/ guursatay 3. La furay/carmal
104	diinta	1.Muslim 2.Ortoodooks 3.Cisa masixi 4.kaatoolik 5.diin kale , sheeg …….
105	Jinsiyadda	1.soomaaali 2.Axmaar 3.Orromo 4.Jinsiyad kale sheeg……..
106	Shaqo	1.Shaqaale 2.Ganacsade 3.Beeralay 4.Arday 5.Guri-joog 6.Billaa-shaqo 7.other specify ……
107	Heerka waxbarasho	1.Aana wax baran 2.Dugsiga hoose 3.Dugsiga dhexe- hoose 4.Diblooma iyo shahaado ka koraysa
108	Dhaqaalaha bishii	……. Lacagta itoobiya

Sumada	Su'aalaha ku saabsan aqoonta guud ee xanuunka cagaarshowga cad gaar ahaan ka dhiiga raaca	Jawaabta	Kaboodis
201	waligaa ma maqashay cudurka cagaarshowga?	1. Haa 2. Maya	Haddi maya S-201 ka bood kuli su'aalaha
202	cagaarshowga ilma aragtida keenta ma fayras baa ?	1. Haa 2. Maya	
203	Cagaarshowgu ma keeni kara kansarka beerka ?	1. Haa 2. Maya	
204	Cagaarshowgu ma ku dhici kara qof walba oo da' kastaba ah?	1. Maa 2. Maya	
205	Joonisku ma ka mid yahay calaamadaha joogtada ah ee cagaarshowga?	1. Haa 2. Maya	
206	lallabbo, mataga, iyo cunta xumidu ma ka mid yihiin astaamaha joogtada ah ee xanuunka cagaarshowga ?	1. Haa 2. Maya	
207	ma dhici karta dadka qaar inay calaamada yeelan waayaan marka uu ku dhaco xanuunka cagaarshowgu ?	1. Haa 2. Maya	
208	Cagaarshowga ma la isugu gudbin karaa irbadaha iyo qalabka qalliinka aana jeermis ka laga dilin?	1. Haa 2. Maya	
209	maqaarka jidhka dadka oo istaabta ma laga qaadi kara xanuunka cagarshowga?	1. Haa 2. Maya	
210	ma laga qaadi kara xanuunka cagarshowaga haddii la isticmaalo sakiinta tima jaraha, ama ir'badda lagu dulleeliyo dhagaha ama sanka?	1. Haa 2. Maya	
211	ma laga qaadi kara xanuunka cagarshowga galmada ?	1. Haa 2. Maya	
212	Hooyadu ma uu gudbin kartaa ilmaha ay caloosha ku sido xanuunka cagaarshowga ?	1. Haa 2. Maya	
213	ma uu malaynaysaa innuu xanuunka cagaarshowgu baaritaan shaybaadh ah leeyahay	1. Haa 2. Maya	
214	ma leeyahay xanuunka cagaarshowga tallaal laga qaato ?	1. Haa 2. Maya	
215	ma laga bogsan karaa xanuunka cagaarshowga ?	1. Haa 2. Maya	
216	Xanuunka cagaarshowgu ma laga bogsan kara iyadoona wax daawo ah la isticmaalin ?	1. Haa 2. Maya	

Moodelka aaminaadda caafimaadka	**Sumada**	**Sualaha ku saabsan waxaad ka qabtid aragti ahaan xanuunka cagaarshowga**	**Jawaabta**				
			Si aad ah u waafaqsanayn (1)	**Ana waafaqsanayn(2)**	**dhexdhexaad ah (3)**	**waafaqsan (4)**	**si adag u waafaqsan (5)**
Aragtida u nuglaanshaha xanuunka cagaarshowga	301	Waxaan dareemayaa inaan xanuunka caagaarshowga khatar sare ugu jiro					
	302	Aad iyo aad ayaan uga walwal qaba inuu xanuunka cagaarshowga igu dhaco					
	303	Fursada uu xanuunka cagaarshowga igu dhici karo aad ayay uu saraysa					
	304	Aad ayay ugu dhawdahay inuu xanuunka cagaarshowga igu dhaco mustaqbalka					
Aragtidda khatarta/ darnaanta xanuunka cagaarshowga	305	Dadka uu xanuunka cagaarsahwgu ku dhaco waxay yeshaan kansarka beerka					
	306	Nolashayda oo dhan way isbedeleysaa hadii uu xanuunka cagaarshawgu igu dhaco.					
	307	Xanuunka cagaarshowgu waa xanuun aad halis uu ah					
	308	Warka xanuunka cagaarshowga wuu ii cabsi galiyaa					
	309	Hadii uu xanuunka cagaarshowgu igu dhaco nolashaydu bilaa rajo ayay noqon					
Aragtida faa’iidada	310	Hadii aan qaato tallaalka xanuunka cagaarshowga kama walwaleen kansarka beerka iyo					

xanuunka cagaarshowga		xanuunka beerka.					
	311	Tallaalku waa wadada saxda ah ee lagaga hortagi karo kansarka beerka ?					
	312	Lacagtaa tallaalka lagu qaato waxaa ka faa'iido badan caafimaadka laga heli karo tallaalka.					
Aragtida caqabadda ka hortaga xanuunka cagaarshowga	313	ma aqaani meesha laga qaato tallaalka cagaarshowga					
	314	kama war hayo inuu jiro tallaal loo qaato xanuunka cagaarsahowga ?					
	315	cabsida aaan ka qabo dhibatada iga raaci karta tallaalka ayaa iga hor joogta inaan qaato talaalka					
	316	Waxaan aminsanahay tallaalka cagarshowga inuu halis yahay					
Kartida Ka hortaga xanuunka cagaarshowga	317	Waxaan si kalsooni ah u raadsan kara xogta xanuunka cagarshowga					
	318	Waxaan qaadan kara saddexda tallaal ee xanuunka cagarshowga loo qaato.					
Xasuusiyayaasha xanuunka cagaarshowga	319	Waxaan aqaana qof leh xanuunka cagaarshowga					
	320	Dhawaan waxaan ka maqlay raadiyawga, ama talafeeshinka xanuunka cagaarshowga					

Sumada	Su’aalaha ku saaabsan isticmaalka tallaalka xanuunka cagaarshowga	Jawaabta
401	Waligaa ma qaadatay tallaalka xanuunka cagaarshowga?	3. Haa 4. Maya

Annex VIII: Curriculum vitae of the principal investigator

1. Personal data

- **Name:** Ahmednasir Abdi Muse
- **Date of birth:** 5/10/1992
- **Place of birth:** Dire Dawa
- **Citizenship:** Ethiopian
- **Gender:** Male
- **Marital status:** single
- **Address:** Bole sub city
- **Country :** Addis Ababa
- **Email : jimcale942@gmail.com**

2. Personal information

I am a reliable, highly motivated and focused individual with strong organizational skills. I have very good communicational skills, a flexible attitude and a desire to succeed. I also have ability to establish very good working relationship with a wide range of professionals/ a team of multicultural compositions and I am a valuable team player always willing to learn new skills. Additionally, I am responsible person, punctual and can learn well under pressure to meet strict deadlines.

3. Educational profile

S/N	Educational background	School/university name	Year of graduation	Place	Qualification
1.	Primary school	Lehagare school	2006	Dire dawa	Certificate
2.	Secondary school	Christ school	2008	Dire dawa	Certificate
3.	High school	Dire dawa comprehensive school	2010	Dire dawa	Certificate
4.	First degree	Jigjiga university	2014	Jigjgia	Bachelor diploma

4. Training and workshops

- Refresher Training on vertical and horizontal SBCC programs Monitoring and Evaluation, 2018, John Hopkins University /center for communication programs, Addis Ababa.
- Communication for Health approaches from May 14-17, 2018, John Hopkins University /center for communication programs, Addis Ababa.
- Refresher training on reproductive health commodity management, from Nov, 14-15, 2017, UNFP in collaboration with school of public health, Addis Ababa University.
- TOT in small scale business identification, planning and management, May 17-22, 2016 PSI/E,
- Basic refresher training on BCC from Oct, 20-23, 2015, PSI/E, Addis Ababa, Ethiopia.
- Revised HIV testing Kits from July23-24, 2016, PSI/E, Adama regional laboratory bureau.
- Basic refresher training on DHIS2 and Google earth mapping Sep, 14 up to 16, 2015, PSI/E, AA
- TOT training on Revised National syndromic STI Management from March, 2 up to 7, 2015, CDC, Adama, Ethiopia
- I have been participated in different workshops in different parts of the country.
- And I have also participated in translation workshop of health education materials from Amharic to Somali.
- Training in health communication from john Hopkins University, Addis Ababa Ethiopia.
- Training on LQAS and independent monitoring on polio immunization campaigns.

5. Work experience

- **Assistant lecturer** at Jigjiga university school of public health for the last three years
- **SBCC Expert** in comprehensive family planning project funded by Packard foundation in Ethiopian public health association during my three months stay as internship student
- **Project Officer in MULU MARPS, HIV PREVENTION PROJECT PROPRIDE** Somali region from April,2016 up to Sep, 30, 2016

6. Skills

6.1 Skills in software application such as the following:

- Computer fundamentals
- MS Word, MS Excel, MS Access, Power point, and Publisher
- Internet Skills
- Data entry and analysis software's like SPSS, STATA, EPI info, EPI DATA and qualitative software like open code and ATLAS

6.2 Communication skills

- Listening, Nonverbal communication ,Clarity, Empathy , Respect and Feedback

8. Language

- **Somali** Mother Tongue
- **English** Excellent in writing, speaking and Listening
- **Amharic** Excellent in writing, speaking and Listening
- **Oromiffa** good in speaking and listening

9. Reference

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Declaration

I, the undersigned, declare that this thesis is my original work in partial fulfillment of the Requirement for the degree of Masters of Public Health and has not been presented for a degree in this or any other university. All source of materials used for this thesis have been duly acknowledged.

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Date of submission: 2, Oct, 2019

This thesis has been submitted to School of Public Health, Addis Ababa University with my approval as the university advisor.

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