



ST. PAUL'S HOSPITAL MILLENNIUM MEDICAL COLLEGE

DEPARTMENT OF PUBLIC HEALTH

**KNOWLEDGE, PRACTICE AND FACTORS AFFECTING HEPATITIS B
VACCINATION AMONG HEALTH CARE PROVIDERS AT GULELE
SUBCITY, ADDIS ABABA**

**A RESEARCH REPORT TO BE SUBMITTED TO THE
DEPARTMENT OF PUBLIC HEALTH SPHMMC IN PARTIAL
FULFILLMENT OF THE REQUIERMENTS FOR THE DEGREE OF
DOCTORATE OF MEDICINE**

By- HABTAMU TAMIRU (Intern)

Advisors- Mr. Shikur Mohammed

Dr. Fikadu

July 2018



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TABLE OF CONTENTS

List of tables	5
List of figures.....	5
Acknowledgment	6
Acronym & Abbreviation	7
Introduction	9
Background	9
Statement of the Problem	11
Justification of the Study	12
Literature review.....	13
Objectives	16
General.....	16
Specific	16
Methods and Materials.....	16
Study area	16
Study design.....	17
Source population.....	17
Sample Size Determination.....	17
Sampling Procedure	18
Eligibility: Inclusion and Exclusion Criteria.....	18
Inclusion Criteria:	18
Exclusion Criteria:	18
Study variables	19
Dependent variables	19
Independent variables	19
Operational definitions	19
Data collection instruments.....	20
Data Quality Assurance.....	20
Data Processing and Analysis.....	20
Ethical Clearance.....	21
Results.....	22
Socio-demography	22
Knowledge about hepatitis infection.....	23

Practice of Hepatitis B viral infection.....	25
Determinants of knowledge	28
Determinants of practice	29
Discussion.....	31
Knowledge about hepatitis B	31
Practice about hepatitis B infection.....	33
STRENGTH AND LIMITATION OF THE STUDY	35
Strength of the study	35
Limitations of the Study.....	35
CONCLUSION AND RECOMMENDATIONS.....	36
Conclusion.....	36
Recommendations	37
Reference	38
Annex I	41
Annex II	42

List of tables

Table 1: Socio-Demographic Characteristics of Gulele subcity, health care workers at health centers Addis Ababa Ethiopia 2018-----	21
Table 2: knowledge of Hepatitis B viral infection among HCWs in Gulele subcity health centers Addis Ababa 2018-----	23
Table 3: practice of Hepatitis B viral infection among HCWs in Gulele subcity health centers Addis Ababa 2018-----	25
Table 4: Cross tabulation between overall independent variables and overall knowledge among HCWs in Gulele sub city health centers Addis Ababa 2018-----	27
Table 5: Cross tabulation between overall independent variables and overall knowledge among HCWs in Gulele sub city health centers Addis Ababa 2018-----	28
Table 6: Determinants of vaccination status among HCWs in health centers of gulele subcity Addis Ababa, Ethiopia, July, 2018-----	31

List of figures

Figure 1: Over all knowledge level among HCWs in gulele subcity health centers Addis Ababa 2018 -----	24
Figure 2: The overall fully vaccinated HCWs in gulele subcity health centers Addis Ababa 2018-----	26

Acknowledgment

First of all I would like to thank God for helping me from the beginning to the end. Next I would like to send my heartfelt gratitude for Mr.shikur for his help starting from the selection of the research title and modification. I would also like to send my acknowledgment for my clinical advisor Dr. Fekadu for taking their time and agreeing to advise me in the whole process of my research development. Last but not least I would also like to send my deepest gratitude for my friends and family members who has been helping me by giving me advices and different materials while developing this research.

Acronym & Abbreviation

KAP- knowledge attitude and practice

HBV- hepatitis B virus

HCV – hepatitis C virus

HCWs - Health care workers

HCC - Hepatocellular carcinoma

SPSS - Statistical package for social science

WHO – World health organization

VCT – voluntary counseling and testing

ABSTRACT

Background: *Hepatitis B is a disease caused by hepatitis B virus (HBV), which is transmitted through percutaneous or per mucosal exposure to infectious blood or body fluids, mainly semen and vaginal fluid. It is the tenth leading cause of death among all diseases worldwide and the fifth leading cause of death from infectious disease worldwide, surpassed only by lower respiratory tract infections, diarrheal diseases, Human Immunodeficiency Virus Acquired Immuno-Deficiency Syndrome (HIV/AIDS), and Tuberculosis.*

Objective: *To assess knowledge and Practice towards Hepatitis B vaccine among health care providers at Gulele sub city.*

Method: *Institution based, cross sectional study was conducted among health centers found in Gulele sub city from January 2018 to July 2018. The study population was selected among the health centers found in Gulele sub city with a sample size of 299 participants. Data was collected by using self-administered, structured and pre tested questionnaire. Data was cleaned, coded and entered into computer and analyzed using SPSS version 20.*

Results: *a total of 295 respondents participated in this research with a response rate of 98.6% among these 90.8 had good knowledge and 64.7% had good practice towards hepatitis B. Only 35.6% of them were fully vaccinated of hepatitis B vaccine. Knowledge of participants had significant association with practice of the study participants.*

Conclusion: *Knowledge and practice of the study participants in this study was high, though the effect of little lack of knowledge good practice can affect the community in which the study participants work now and then but the vaccination status of the Health care workers was low and requires improvement.*

Recommendations: *Governmental and non-governmental organizations need to consider expanding the currently available prevention facilities and put in place sustainable infection control and prevention strategies. The vaccine should be available easily for health professionals.*

Introduction

Background

Hepatitis B is a disease caused by hepatitis B virus (HBV), which is transmitted through percutaneous or per mucosal exposure to infectious blood or body fluids, mainly semen and vaginal fluid. It is the tenth leading cause of death among all diseases worldwide and the fifth leading cause of death from infectious disease worldwide, surpassed only by lower respiratory tract infections, diarrheal diseases, Human Immunodeficiency Virus Acquired Immuno-Deficiency Syndrome (HIV/AIDS), and Tuberculosis(1)

Hepatitis B is a potentially life-threatening liver infection caused by the hepatitis B virus which is a major global health problem. It can cause chronic liver disease and puts people at high risk of death from cirrhosis of the liver and liver cancer. Moreover, extra hepatic lesions occur in other organs of the body particularly kidney by deposition of immune complexes as result of this infection. Persons with chronic infection also remain a carrier for HBV transmission (2)

People at high risk include health care workers (HCWs) in contact with blood and human secretions, hemodialysis staff, oncology and chemotherapy nurses, all personnel at risk of needle stick/sharps injuries, which includes those working in operating rooms and clinical laboratories, respiratory therapists, surgeons, doctors, dentists, as well as medical, dental and nursing students(3)

Hepatitis B virus (HBV) infection is one of the major public health problems in the world. According to the recent estimates, about one-third of the world population is infected with HBV (1, 2). Of these, about 360 million people are chronic carriers and are at risk of developing liver diseases like cirrhosis and hepatocellular carcinoma (HCC). The prevalence of chronic HBV infection greatly varies worldwide (0.5–20 %), due to differences in age at the time of infection and mode of acquisition. A disproportionately high prevalence of chronic HBV infections exists in Southeast Asian and sub-Sahara African countries. Health care workers (HCWs) are at high risk of HBV infection in the health care settings. The prevalence rate of HBV in HCWs is about 2–10 times higher than the general populations in the world. In context of HCWs, the risk factors for HBV infection are percutaneous or mucosal exposure to infected blood or body fluids, using inadequately sterilized medical equipment or contact with non-intact skin. The average risk for

acquiring HBV infection after percutaneous exposure to infected blood has been estimated to be 6–30 %; whereas it is about 0.3 % for human immunodeficiency virus(3)

The World Health Organization (WHO) estimated that, of the 35 million HCWs worldwide, 3 million experience percutaneous exposures to blood pathogens each year, of these 2 million are exposed to hepatitis B virus (3, 4) Worldwide annual proportion of health care workers (HCWs) exposed to HBV infection were 5.9%. In developing countries, 40-60% of HBV infection in HCWs was attributed to professional hazard while in developed countries the attributed fraction was less than 10% due to vaccination coverage(4)

Studies conducted among different segments of the population in Ethiopia showed that hepatitis B virus is a major public health problem in the country. A study conducted in Addis Ababa to investigate sero-epidemiology of hepatitis B virus estimated that the prevalence of hepatitis B virus infection was 7 % (5, 6)

Hepatitis B virus (HBV) infection in the health setting is a global public health problem. The risk of occupational exposure to HBV among health care workers is a major concern, especially among health professionals. In Ethiopia, very little is known about the knowledge and practices of trainees in the health professions towards occupational risk of HBV (7)

HBV is unique compared to other sexually transmitted diseases, because it can be prevented with vaccine which is highly efficacious that protects against HBV infection 90-100% (8). Primary vaccination consists of greater or equal to three doses of hepatitis B vaccine administered intramuscularly with the interval of one month between the first and the second dose and five months between the first and the third dose produces a protective antibody response in approximately 30%–55% of healthy adults aged <40 years after the first dose, 75% after the second dose, and >90% after the third dose (9).other means for prevention of hepatitis B infection is by practicing standard precautions such as regular personal hygiene; use of protective barriers; and by proper disposal of sharps, body fluids, and other clinical wastes in health care institutions. Moreover, after exposure to blood or body fluids, post-exposure prophylaxis can be administered as a combination of passive immunization with hepatitis B immunoglobulin and vaccination with hepatitis B vaccine. However, the most cost-effective method to prevent and control hepatitis B is through pre-exposure vaccination and compliance of standard precautions. (9, 10)

Statement of the Problem

Hepatitis B is an important, infectious occupational hazard for HCWs exposed to human blood. The high risk of infection is due to the high prevalence of virus carriers in the assisted population, the high frequency of exposure to blood and other bodily fluids, and the highly contagious nature of HBV (11)

Hepatitis B is a potentially life-threatening liver infection caused by the hepatitis B virus which a major global health problem is causing chronic hepatitis, cirrhosis and liver cancer. It is one of the major public health problems in the world especially in developing countries. The risk of the prevalence rate of HBV in HCWs is about 2–10 times higher than the general populations in the world. It is higher than the general population due to the increased contact with percutaneous or per mucosal exposure to infectious blood or body fluids (3)

Contaminated needles cause 8–16 million HBV infections each year, compared with 2.3–4.7 million Hepatitis C virus (HCV) infections, and 80,000–160,000 HIV infection (4). This data shows how infectious Hepatitis B is and trying to prevent Hepatitis B infection will save millions of lives. (4)

A range of measures and interventions can contribute to reduce HBV transmission to HCWs to low levels. One among them is being vaccinated with the three dose HBV vaccine which is protective in more than 90% of users who have completed all the doses at 0, 1 and 6 months. (12)

In spite of availability of safe and effective vaccine against HBV throughout the world many HCWs especially in resource poor countries remain at risk because they are not vaccinated against HBV (14). The reason for not being vaccinated may be lack of knowledge about the vaccine. In Ethiopia there are only few studies conducted on knowledge and practice of hepatitis B vaccine among HCWs but there are no studies conducted specifically on HCWs at health center level who are at increased risk in comparison to other HCWs. This study assessed the knowledge about HBV vaccine and vaccination status against hepatitis B among HCWs working at health center in gulele sub city, Addis Ababa. Based on the finding conclusions and recommendations was made.

Justification of the Study

Prevention is the only safe strategy against high prevalence of HBV. One among the different prevention means is giving vaccination for HCWs. Like other HCWs nurses are at a higher risk of acquiring HBV infection compared to the general population.

Hepatitis b infection is very common in developing countries. The practice of modern medicine has contributed a lot in the increase of the case and spreading of blood borne diseases like Human immune deficiency virus and HBV due to lapse in the sterilization technique of instruments and improper hospital waste management as 10 to 20% health care waste is regarded hazardous. This increases the chance of acquiring the infection among health care workers.(8) Being hepatitis a major health issue there are no available studies especially in Addis ababa. Even if there are few studies done in Ethiopia either in Addis or different cities and medical schools this study tried to show the gap in hepatitis B vaccination knowledge and practice among health care workers especially in the lower health facilities like the health centers.

Based on the results obtained from this study it was easier to generalize the knowledge and practice of hepatitis B vaccine utilization among HCWs in health centers of Addis ababa. Identify where the problem is, take a proper measure by the federal ministry of health to improve the lives of health care workers and decrease risk of occupational exposure.

Literature review

The World Health Organization (WHO) estimates that about 3 million HCWs face occupational exposure to blood borne viruses each year (2 million to HBV, 900,000 to HCV, and 300,000 to HIV), 90% of the infections that result from these exposures are in low income countries (2), (7). Developing countries, especially those in sub-Saharan Africa, that account for the highest prevalence of HIV-infected patients in the world also report the highest incidences of occupational exposures.(8)

Knowledge

A study done in Saudi Arabia on Knowledge, attitudes and practices toward prevention of HBV infection among medical students at northern border university Arar showed. Regarding students' knowledge about hepatitis B infection, 81% of them knew that carriers could transmit infection, 89.5% of them knew that it could not be spread by casual contact, 80% by contact with open wound, 96.5% by contaminated blood and body fluids, 92.5% by unsterilized syringe, needle and surgical instruments and 79.5% by unsafe sex. In total, 86.5% of students knew that a vaccine could prevent HBV infection, 95% knew it had been laboratory tested, 64% knew HBV had post exposure prophylaxis and only 55% knew that it could be cured. In all, 75.5% of students knew that HBV caused liver cancer. Regarding attitude, 23% of students said they had no concern of being infected with HBV, 86.5% agreed that HBV vaccine was safe and effective and 90% believed that following infection, control guidelines would protect them from being infected by HBV at work. (15)

In a study done in North-Eastern Italy about Knowledge, attitudes, beliefs and practices of occupational physicians towards vaccinations of health care workers Only 12 out of 90 subjects correctly identified all the 7 recommended immunizations. The hepatitis B virus (HBV) vaccine was correctly identified by 95.6% of the sample, and was also associated with the more positive attitude and the more accurate risk perception. General knowledge of vaccine and knowledge of official recommendations were significantly correlated with the attitude towards immunization practice ($r = 0.259$, $p = 0.014$ and $r = 0.438$, $p < 0.0001$). In the regression analysis general knowledge (unstandardized coefficient (B) = 0.300, 95% confidence interval (CI): 0.090-0.510, $p = 0.006$) and risk perception (B = 0.579, 95% CI: 0.155-1.003, $p = 0.008$) were significant predictors of the propensity to vaccinate. (16)

In a study done in South Africa, only 1.8% of HCWs scored high level of knowledge for hepatitis B vaccine. In this study, only 74.5% showed positive attitude towards HBV vaccination. Of the total respondents (17)

Another cross sectional study done in Northwest Ethiopia on Hepatitis B vaccine knowledge and vaccination status among health care workers of Bahir Dar City. About 62% of HCWs scored above the mean knowledge score about hepatitis B vaccine. About 72% of the respondents correctly responded that an adult should take three or more doses of hepatitis B vaccine to be fully immunized. But only about 50% of the respondents knew that hepatitis B vaccine could be given as post exposure prophylaxis. About 25% of the respondents also wrongly responded that hepatitis B vaccine could effectively treat patients with acute hepatitis B infection. Only 59.4% of HCWs knew the necessity of additional booster dose five years after completing the three doses of vaccines. All these figures show presence of knowledge gap about hepatitis B vaccine. (1)

Another study at Haramaya University, Ethiopia on Assessment of Knowledge and Practice towards Hepatitis B among Medical and Health Science Students Concluded that there is poor knowledge among the medical and health science students entering into the profession practice about the hazards of Hepatitis B, its mode of transmission and prevention. Moreover, majority (95.3%) the students were not fully vaccinated against Hepatitis B and 48.4% of the students were no aware about the availability of post exposure prophylaxis for HB, which made them more vulnerable to the disease in their professional life and 75.8% of the students were not participated in health education program related to Hepatitis-B. Study department is the strong independent correlates for poor knowledge of the students towards transmission, prevention of HB and practice in preventing HB. (25)

From studies done in the capital city, there was study done on assessment of knowledge about hepatitis b vaccine and vaccination status of nurses against hepatitis b virus at governmental hospitals of Addis ababa; Ethiopia 2015. This study found the mean knowledge score for HB vaccine to be 8.38 with standard deviation of 2.50. More than half of study participants (51.8%) had poor knowledge about the HB vaccine. (26)

Practice

A study done in Saudi Arabia on Knowledge, attitudes and practices toward prevention of HBV infection among medical students at northern border university Arar showed Regarding practice, only 56.5% of students had screened for HBV infection 22% had had a needle prick injury but 68% would report that injury. Furthermore, 69.5% have received HBV vaccine but only 38% of them had received 3 doses. (15)

In a study done in South Africa, 72% of HCWs had received one or more doses of hepatitis B vaccine but only 61.2% of those vaccinated had received all 3 doses of the vaccine. (17)

In a Nigerian university there was study done on Medical and dental students' attitude and practice of prevention strategies against hepatitis B virus infection the result showed over eighty percent (83.2%) of the participants had at least a dose of the HBV vaccine while 79.65% completed the three doses. Majority (94.7%) of the students that did not receive the vaccine cited their busy schedule as the reason for their failure to be vaccinated. Taking every patient as a contagious disease risk (86.5%), washing hands after contact with patients' body fluids (82.1%) and wearing gloves before touching mucous membranes and non-intact skin (74.1%) were the most practiced universal standard precaution items. (18)

A cross sectional study done on Status of hepatitis B vaccination among surgeons practicing in Ethiopia, Ninety-four (95.9%) of the respondents were males, Only 24 (23.5%) were vaccinated against HBV, 18/24 (75%) of whom received the three recommended doses. The main reasons for non-vaccination is lack of knowledge about the availability of the vaccine in the country, lack of time and mere negligence. Differences in age, sex, and duration of practice, field of specialty and respondent's institution between vaccinated and unvaccinated were not significant ($P > 0.05$). Ninety-two (93.9%) believe the vaccination is very useful for the surgeon. 86.4% of the respondents claim they wear double gloves in more than 50% of their operations while 76 (77.6%) had sustained sharp injury over the past one year. 13 (13.25%) of the respondents had taken ART prophylaxis in the past.(24)

Among the study participants only 67(24.4%) were vaccinated at least once in their life time. Out of those respondents who were vaccinated, only 35.8% were fully vaccinated. This study also identified vaccination status was associated with factors like the hospital where the respondents

were working, hospital wards, history of exposure to needles and sharp injury and knowledge of respondents about the vaccine. (26)

Objectives

General

- To assess the knowledge, practice and factors affecting hepatitis b vaccination among health care providers at Gulele sub city.

Specific

- To determine the knowledge of Hepatitis b vaccine among health care providers at Gulele sub city.
- To assess the practice of Hepatitis b vaccine among health care providers in health centers at gulele sub city.
- Factors affecting hepatitis b vaccination among health care providers at Gulele sub city.

Methods and Materials

Study area

The study was conducted at gulele sub city in Addis ababa the capital city of Ethiopia. Ethiopia is found on east Africa and its one of the developing country in the world with poor health care system. Gulele is one of the 10 sub cities in Addis ababa where every subcity in city has 1 health center for 1 wereda in gulele sub city there are 10 woredas making it about 10 health centers. This include Entoto HC, fana HC, michew HC, selam HC, shiro meda HC, Guto meda HC, tibebe birhan, hidase HC, addisu gebya HC and shegole HC. There are 1100 health care professionals working in gulele health centers.

Study design

Institution based, cross sectional study was conducted to carry out this research.

Source population

All health care workers working in health centers found in gulele sub city and personals who come into contact with patients, or are potentially exposed to blood and body fluids from patients while attending to or handling samples from patients and handling clinical wastes. These healthcare workers include health officers, midwives, nurses, medical laboratory professionals, radiographers and general service providers. Only those who were present at the time of sample collection were recruited.

Sample Size Determination

The sample size for the study is determined using single population proportion formula

$$n = \frac{(Z_{\alpha/2})^2 P (1-p)}{d^2}$$

Where: no = required sample size

$Z_{\alpha/2}$ = Critical value=1.96(Standard normal deviation usually set at 1.96 which corresponds to 95% confidence interval)

d= precision (marginal error) =0.05

p vale for knowledge was 0.91 and p value for practice was 0.62 and the one with maximum sample size was used.

Hence,

$$\begin{aligned} &= \frac{1.96^2 \times 0.62(1-0.62)}{0.05^2} \\ &= 362 \end{aligned}$$

Because our study population number is less than 10,000 the final sample size determined as follow:

$$N= 1,100$$

$$n = \frac{n_0}{[1 + n/N]}$$

$$\frac{362}{1 + (362/1100)}$$

$$= \underline{\underline{272}}$$

When we add, 10% non-respondent percentage, final sample size will be **299**

Sampling Procedure

From the total of 10 health centers 4 health centers were selected by using simple random sampling (lottery method). the sample size is 299 and according to the sub city health office there are 110 HCWs in each of the health centers from the 4 randomly selected health centers. More than 440 HCWs are there making it adequate for my 299 sample size.

Eligibility: Inclusion and Exclusion Criteria

Inclusion Criteria:

- In this study nurses, midwifery nurses, laboratory technicians, cleaners, patient porter and other general service providers will be included in this study. Any Healthcare provider who is working at the health centers the study will be conducted were included.

Exclusion Criteria:

- Health workers who were not be available during the period of sample collection, those who do not have frequent exposure for blood and other body fluids due to the nature of their working environment and who are not voluntary to participate were excluded from the study.

Study variables

Dependent variables

- ✓ Knowledge and practice of hepatitis B and its vaccination status

Independent variables

- ✓ Age
- ✓ Sex
- ✓ Marital status
- ✓ Religion, Profession
- ✓ Educational level
- ✓ Years of experience
- ✓ Current department (working area)

Operational definitions

- **Good Knowledge about the vaccine:** Refers to those study participants who scored point greater than or equal to the mean score of knowledge questions about the vaccine.
- **Poor knowledge about the vaccine:** Refers to those study participants who scored point less than the mean score of knowledge questions about the vaccine.
- **Good practice:** Refers to those study participants who scored point greater than or equal to the mean score of practice questions about the vaccine.
- **Poor practice:** Refers to those study participants who scored point less than the mean score of practice questions about the vaccine.
- **Vaccinated:** Refers to those study participants who received at least one dose of HB vaccine.
- **Fully vaccinated:** Refers to those study participants who received the recommended doses of the vaccine (Three doses on specified time gap)
- **Partially vaccinated:** Refers to those study participants who received less than the recommended doses of the vaccine (only one or two doses) and those who took without schedule.
- **Unvaccinated:** Refers to those study participants who received no vaccine.

Data collection instruments

Two facilitators from each health centers where data collection were held and recruited and were given a highlight about the study, the collection and the questioners. For the purpose of data collection an anonymous self-administered structured questionnaire was prepared. Draft of semi-structured questionnaire was adopted from a study done at AAU. Questionnaires were first developed in English and translated into local language, Amharic. It consists of a series of questions on the Knowledge and Practice of respondents on HBV infection and its prevention (Annex 1). The questionnaire was handed over to the respondents in person.

Prior to the actual data collection questionnaire was pretested in health centers other than one of the Gulele health centers This helped to identify problems that were addressed both on the questionnaire and side of data collectors.

Data Quality Assurance

The two facilitator's were recruited in this study. Discussion was held between principal investigator and the data collectors to clear out any difficulties they might encounter during data collection. In addition to this they were given an orientation on how to obtain informed consent that encompassed: the significance of the survey, importance of respondent's participation and what the survey outcome means to them, voluntary nature of the study and confidentiality issues. The data collectors were supervised and the filled questionnaires will be checked by the principal investigator.

Data Processing and Analysis

For the quantitative research, first the data was checked for completeness and consistency. Then it was coded and entered in the computer using statistical package for social science (SPSS) software, version 20. Random checking was done to verify the validity of the entered data. Simple descriptive statistics such as frequency and percentage were used to summarize the results, and chi-square was used to describe the association between variables. And also the degree of association between dependent and independent variables was described using crude odds ratio (COR) and adjusted odds ratio (AOR) with 95% confidence interval (CI). Analysis of data was done using stepwise logistic regressions in order to evaluate the effects of independent variables

on the dependent. P-value < 0.05 was considered as statistically significant association. Once analyzed, the data was presented and discussed as per the listed objectives of the study.

Ethical Clearance

Letter of ethical clearance was obtained from SPHMMC. Letter for cooperation from each level is expected, informed consent was obtained from each participant in the research, and confidentiality was maintained.

Results

Socio-demography

A total of 295 gulele sub city health center HCWs were enrolled in the study giving a respondent rate of 98.6%. Among the study participants, 110 (37.3%) were males and 185 (62.7%) were females. large number of the study participants 212 (71.9%) were in the 20-29 age group, 73(24.7%) were in the 30-39 age group and the rest 10(3.4%) were above 40. The study participants from nursing department constituted 130(44.1%), 99(33.6%) were health officers, 14(4.7%) were lab technicians and 40(13.6%) were mid wives. Majority of the respondents were orthodox in religion 197(66.8%), Muslims were 53(18.0%) and protestants 41(13.9%). Based on the work experience of the participants 206(69.8%) less than 5yrs, 65(22%) were less than ten yrs and 24(8.1%) had work experience more than ten yrs. (table 1)

Table 1: Socio-Demographic Characteristics of Gulele subcity, health care workers at health centers Addis Ababa Ethiopia 2018

Variables	frequency(n=295)	percent %
Age		
20 – 29	212	71.9%
30 – 39	73	24.7%
>= 40	10	3.4%
Sex		
Male	110	37.3%
Female	185	62.7%
Religion		
Orthodox	197	66.8%
Muslim	53	18.0%
Protestant	41	13.9%
Catholic	4	1.4%
Marital status		
Single	125	42.4%
Married	164	55.6%
Separated/divorced	6	2%
Educational status		
Certificate	13	4.4%
Diploma	73	24.7%
Degree (BSc)	208	70.5%
Masters	1	0.3%
Profession	130	44.1%
Nurse	99	33.6%
health officer	14	4.7%

lab technician	40	13.6%
mid wives	12	4.1%
cleaners		
Working department		
Surgery	2	0.7%
Laboratory	9	3.1%
Labor ward	83	28.1%
Emergency	102	34.6%
OPD	82	27.8%
Ward	17	5.8%
Working experience		
<5	206	69.8%
5-9	65	22.0%
>10	24	8.1%

Knowledge about hepatitis infection

All 295(100%) of the study participants said they have heard about hepatitis b infection and the vaccine. On this study all the participants 295(100%) agreed on the transmission of Hep B by contact with infected needles and contact with infected blood. Majority of the respondents 291(98.6%) said Hep B can be transmitted by contact with vaginal fluid and Significant portion 223(75.6%) of the respondents incorrectly mentioned Hep b can be transmitted by contact with urine contact. Courses about infection prevention 117(39.7%) said they have taken course and the rest replied they have never taken a course about infection prevention.

Participant's response on knowledge about hep B vaccine majority 277(93.9%) correctly answered three shots are needed to be fully vaccinated and 267(90.5%) responded correctly about the time difference between the first and second vaccine and also 199(67.5%) answered the time gap between the second and the third vaccines. According to the respondents 158(53.6%) believe hepatitis b is a curable disease even though that is not the case. (Table 2)

The respondents who are working at gulele health centers 117(39.7%) said they had a course on infection prevention since they have started working there but majority 178(60.3%) of the respondents didn't have any course about infection prevention.

Table 2: knowledge of Hepatitis B viral infection among HCWs in Gulele subcity health centers Addis Ababa 2018

Knowledge assessment questions	Frequency(n=295)	Percent %
Transmission with contact with infected needle		
Yes	295	100%
No		
I don't know		
Transmission with blood		
Yes	295	100%
No		
I don't know		
Transmission with vaginal fluid		
Yes	291	98.6%
No	3	1%
I don't know	1	0.3%
Transmission with urine		
Yes	223	75.6%
No	67	22.7%
I don't know	5	1.7%
Hep b is curable disease		
Yes	158	53.6%
No	128	43.4%
I don't know	9	3.1%
Amount of vaccine needed for full immunization		
Correct	277	93.9%
Incorrect	18	6.1%
Difference b/n first & second vaccine		
Correct	267	90.5%
Incorrect	28	9.5%
Difference b/n second & third vaccine		
Correct	199	67.5%
Incorrect	96	32.5%
Can be used as PEP		
Yes		
No	132	44.7%
I don't know	163	55.3%
Should be tested to know effectiveness		
Yes	149	50.5%
No	127	43.1%
I don't know	19	6.4%

Out of the total mark (12) the overall knowledge questions of the study participants shows that majority 268 (90.8%) of the respondents had good knowledge and the remaining 27 (9.2%) had poor knowledge with a maximum and minimum value of 6 and 3 points respectively. (Figure 1)

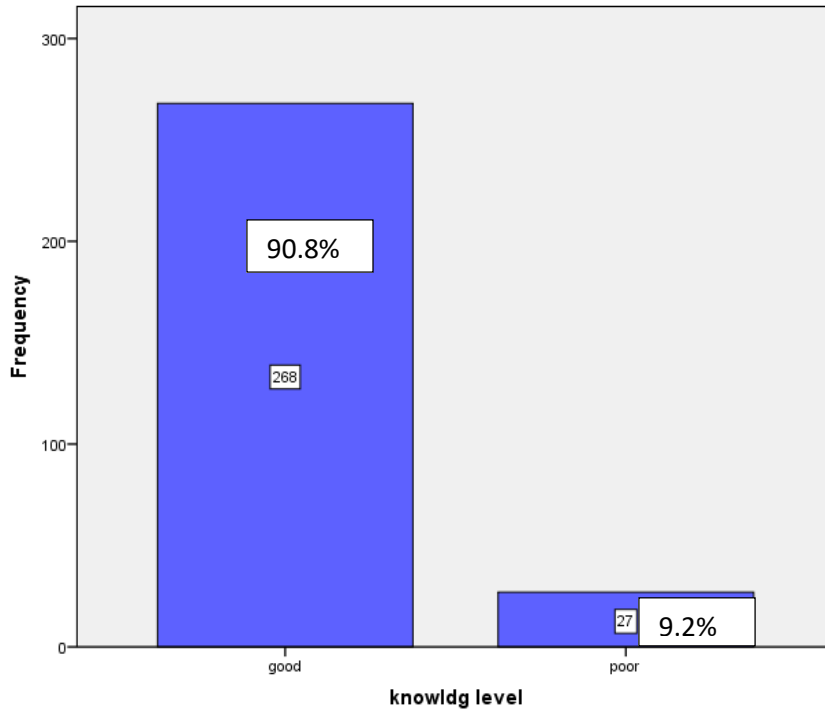


Figure 1: Over all knowledge level among HCWs in gulele subcity health centers Addis Ababa 2018

Practice of Hepatitis B viral infection

Among the respondents in this study 103(34.9%) have been exposed to hepatitis B on their work place. The main reason for exposure were work load 36(31.0%) and rushing at work 36(31.0%) others include carelessness 21(18.1%) and absence of protective equipment 18(15.5%). Those who were exposed to hepatitis b the first measure they took after being exposed mainly was washing the injury site with water 58(49.6%) and 32(27.7%) immediately reported.

One hundred sixty five (55.9%) of the study subjects often use additional infection control precaution when they are caring for patients with Hepatitis B and only 192(65.1%) of the study participants said the wear gloves in contact with every hepatitis b patients.

In this study the health care workers who are vaccinated for hepatitis b are 143(48.5%) but only 105(35.6%) have completed the full vaccination the main reason given by the participants for not being vaccinated was the vaccine not being available 47(30.3%) and expensiveness of the vaccine 38(24.5%) and the reason for not being fully vaccinated was expensiveness of the vaccine 59(32.1%), work load 43(23.4%) and some of the respondents haven't finished taking the vaccine 36(19.6%). (Table 3)

Table 3: practice of Hepatitis B viral infection among HCWs in Gulele subcity health centers

Addis Ababa 2018

Practice assessment questions	Frequency(n=295)	Percent %
Have you ever been exposed		
Yes	103	34.9%
No	156	52.9%
I don't know	36	12.2%
Factor contributing for exposure		
Lack of infection prevention supplies	18	15.5%
Being busy	36	31.0%
Rushing at work	36	31.0%
Carelessness	21	18.1%
Other reason	5	4.3%
Post exposure preventive measure taken		
Immediately reporting	32	27.4%
Know more about the pt	19	16.2%
Allow injury to bleed	4	3.4%
Wash injury site with water	58	49.6%
Other	4	3.4%
Use additional infection precaution with Hep B pts		
Yes		
No	165	55.9%
I don't know	130	44.1%
Wear gloves with contact of hep B pts		
Yes	192	65.1%
No	103	34.9%
Have you ever been vaccinated		
Yes	143	48.5%
No	152	51.5%
Reason for not being vaccinated		
Cost	38	24.5%
Not being available	47	30.3%
Afraid side of effects	11	7.1%
	20	12.9%

Too busy	24	15.5%
Lack of information	6	3.9%
Afraid of needles		
Have you taken the full does		
Yes		
No	105	35.6%
I don't know	190	64.4%
Reason for not receiving full course		
Afraid of side effects	6	3.3%
Expensiveness	59	32.1%
Busy work schedule	43	23.4%
Availability of vaccine	29	15.8%
Not done being vaccinated	36	19.6%
Afraid of needles	11	6.0%

Out of the total (5) marks the overall practice category of study participants towards hepatitis B virus prevention were 191 (64.7%) for good practice and 104 (35.3%) for poor practice towards hepatitis B virus prevention.

Among the total respondents who had good knowledge 67.2% of them have good practice too the remaining 32.8 % had poor practice. (Figure 2)

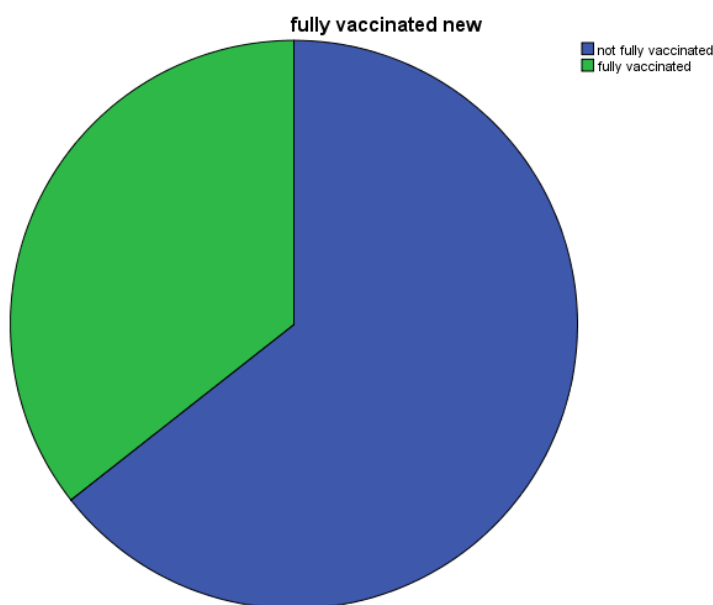


Figure 2: The overall fully vaccinated HCWs in gulele subcity health centers Addis Ababa 2018

Determinants of knowledge

A chi-square test of independence was performed to examine the relation between knowledge score and socio-demographic variables as well as professional characteristics of HCWs. The result indicated that educational level of respondents were found to have significant association with overall knowledge score. Relatively higher number of study participants with degree were found to have higher knowledge score than the ones with diploma and below. In the contrary, relatively higher number 20(74.1%) of survey participants in the category diploma were found to have poor knowledge score. (Table 4)

Table 4: Cross tabulation between overall independent variables and overall knowledge among HCWs in Gulele sub city health centers Addis Ababa 2018.

Variables	Over all knowledge score N (%)		Chi square	p-value
	Poor	Good		
Sex			0.65	0.42
Male	12(10.9)	98(89.1)		
Female	15(8.1)	170(91.9)		
Age			1.5	0.46
20 - 29	18(8.5)	194(91.5)		
30 – 39	7(9.6)	66(90.4)		
Above 40	2(20)	8(80)		
Religion			4.06	0.25
Orthodox	15(7.6)	182(92.4)		
Muslim	5(9.4)	48(90.6)		
Protestant	7(17.1)	34(82.9)		
Catholic	None	4(100)		
Marital status			1.7	0.42
Single	14(11.2)	111(88.4)		
Married	12(7.3)	152(92.7)		
Divorced	1(16.7)	5(83.3)		
Educational status			39.1	0.000
Certificate	1(7.7)	12(92.3)		
Diploma	20(27.4)	53(72.6)		
Degree	6(2.9)	202(97.1)		
Masters	None	1(100)		
Profession			2.01	0.73
Nurses	12(9.2)	118(90.8)		
Health officers	11(11.1)	88(88.9)		
Lab technicians	None	14(100)		
Mid wives	3(7.5)	37(92.5)		

Cleaners	1(8.3)	11(91.7)		
Current department			8.2	0.14
Surgery	1(50)	1(50)		
Lab	None	9(100)		
Labor ward	4(4.8)	79(95.2)		
Emergency	11(10.8)	91(89.2)		
Other	10(12.2)	72(87.8)		
Ward	1(5.9)	16(94.1)		
Previous training	14(12)	103(88.0)	1.8	0.17

Determinants of practice

According to findings in this study sex of respondents and current working departments of the participants were found to have significant association with over all practice score and vaccination. (Table 5)

Table 5: Cross tabulation between overall independent variables and overall knowledge among HCWs in Gulele sub city health centers Addis Ababa 2018

Variables	Over all practice score N (%)		Chi square	p-value
	Poor	Good		
Sex			4.29	0.05
Male	47(42.7)	63(57.3)		
Female	57(30.8)	128(69.2)		
Age			0.89	0.22
20 - 29	74(34.9)	138(65.1)		
30 – 39	27(37)	46(63)		
Above 40	3(30)	7(70)		
Religion			1.52	0.67
Orthodox	74(37.6)	123(62.4)		
Muslim	17(32.1)	36(67.9)		
Protestant	12(29.3)	29(70.7)		
Catholic	1(25)	3(75)		
Marital status			0.6	0.73
Single	41(37.2)	84(67.2)		
Married	61(37.2)	103(62.8)		
Divorced	2(33.3)	4(66.7)		
Educational status			2.6	0.45
Certificate	3(23.1)	10(76.9)		
Diploma	30(41.4)	43(58.9)		
Degree	71(34.1)	137(65.9)		
Masters	None	1(100)		
Profession			1.25	0.86

Nurses	45(34.6)	85(65.4)		
Health officers	37(37.4)	62(62.6)		
Lab technicians	6(42.9)	8(57.1)		
Mid wives	13(32.5)	27(67.5)		
cleaners	3(25)	9(75)		
Current department			14.58	0.012
Surgery	1(50)	1(50)		
Lab	6(66.7)	3(33.3)		
Labor ward	19(22.90)	64(77.1)		
Emergency	43(42.2)	59(57.8)		
Other	32(39)	50(61.0)		
Ward	3(47.6)	14(82.4)		
Previous training	37(31.6)	80(68.4)	1.8	0.17
Knowledge			7.5	0.06
Poor knowledge	16(59.3)	88(32.8)		
Good knowledge	11(40.7)	180(67.2)		

Determinants of vaccination status

A logistic regression analysis was conducted to identify predictors of vaccination status among HCPs. When binary logistic regression was run separately for each predictor (Bivariate analysis); sex [OR=1.91 (95% CI=1.1-3.33)], of respondents was the only independent variable which was found to be significant predictor of vaccination status.

Table 6 Determinants of vaccination status among HCWs in health centers of gulele subcity Addis Ababa, Ethiopia, July, 2018.

Variables		Yes N (%)	No N (%)	Crude OR (95%CI)
Sex	Male	45(40.1)	65(59.1)	1.91(1.1-3.33)
	Female	98(53)	87(47)	1
Age	20-29	112(52.8)	110(47.2)	1.92(0.31-12.7)
	30-39	27(37)	46(63)	1.85(0.28-12.1)
	Above 40	4(40)	6(60)	1
Religion	Orthodox	94(47.7)	103(52.3)	1.8(0.81-4.07)
	Islam	28(52.8)	25(47.2)	1.4(0.53-3.8)
	Protestant	19(46.3)	22(53.7)	1

Marital status	Married	71(43.3)	93(56.7)	0.38(0.04-3.2)
	Single	71(56.8)	54(43.2)	0.5(0.06-4.4)
Educational status	Certificate	4(30.8)	9(69.2)	5.1(0.1-1.7)
	Diploma	30(41.1)	43(58.9)	1.345 (0.79-2.29)
	Degree	108(51.9)	100(48.1)	4.37 (2.54- 7.54)
	Masters	-	1(100)	1
Profession	Nurses	66(50.8)	64(49.2)	1.01 (0.57- 1.76)
	Health officers	44(44.4)	55(55.6)	0.98 (0.53- 1.79)
	Lab technicians	9(64.3)	5(35.7)	0.84 (0.35- 2.03)
	Mid wives	20(50)	20(50)	0.61 (0.23- 1.63)
	Cleaners	43(3.3)	8(66.7)	1
Current department	Surgery	1(50)	1(50)	4.95(0.1-21.0)
	Lab	4(44.4)	5(55.6)	4.32(0.00-34.2)
	Labor ward	49(59)	34(41)	0.940.24-4.37)
	Emergency	43(42.3)	59(57.8)	3.830.93-15.7)
	Other	34(41.5)	48(58.5)	3.48(0.82-14.8)
	Ward	12(70.6)	5(29.4)	1

Discussion

Hepatitis B information

This study assessed the knowledge and practices of HBV and its vaccination among HCWs in gulele sub city health centers, Addis Ababa. According to the result of this study all 295(100%) of the study participants know or heard of hepatitis B infection and its vaccine.

In this study 119(40.9%) participants got their information about hepatitis B infection and vaccine from courses given and 169(57.3%) acquired their information from formal education. Which is close to the study done in AAU it was found that most 254 (61.2%) of the study participant had got their primary information about Hepatitis B from lectures and seminars. According to this study only 117(39.7%) of the participant has taken a course on infection prevention before.

Knowledge about hepatitis B

In this study knowledge about both hepatitis infection and the vaccine were accessed and based on the findings all 295 of the participant knew the transmission of hep B can be with infected needle and blood contact, transmission with vaginal fluid (98.6%). But 75.2% of HCW s wrongly reported that hepatitis B can be transmitted through contact with infected urine. Similarly in a study done in our country at Bahir dar most respondents reported that hepatitis B virus may be transmitted

from one person to the other through sharps injury (91.2 %) and blood transfusion (91.7%). But few HCWs wrongly reported that hepatitis B can be transmitted through faeco-oral route (20.9%) and through polluted water (9.9%). Similarly, 9.7% and 7.3% of the respondents wrongly reported that hepatitis B infection can be prevented by avoiding drinking contaminated water and eating uncooked food respectively. These facts also show presence of knowledge gap among the respondents about hepatitis B infection transmission and prevention mechanisms.

About 93.9% know the amount of vaccines needed for full immunization and only 44.7% know that after exposure post exposure prophylaxis can be used which is a low number because out of the 35 million HCWs worldwide, 3 million experience percutaneous exposures to blood pathogens each year, of these 2 million are exposed to hepatitis B virus and the exposure increases in developing countries like Ethiopia.

A study done in Teresina, Brazil decline that 87.4% of the respondents know that there is three dose of Hepatitis B virus vaccine (30).another study conducted in Kuwait reported that 65.9 % of the respondents know dose of Hepatitis B vaccine required for complete protection is three and 44.4% of them answers correctly the expected interval between last dose and dose preceding it is greater or equal to six months. On the other hand the result of this study was only 93.9% of the study participants know the correct full dose of Hepatitis B vaccine and 67.5% of them know the correct interval between the last dose and dose preceding it. This number is relatively higher compared to other studies done in different part of the world and can even be improved with courses about infection prevention.

Regarding the overall knowledge of the study participants, the vast majority (90.8%) of the study participants had good knowledge and 9.2 % of them had poor knowledge. similarly a study conducted in Gauteng province; South Africa revealed that 87% of the study participants had indicated good knowledge and the remaining 13% had poor knowledge regarding hepatitis B viral infection which is similar to study done in Addis Ababa showing 91.1% of the participants had good knowledge.

As far as determinants of knowledge score is concerned, the study indicated that only level of education was found to have significant association with overall knowledge score. The effect of education status on knowledge score is evident; more educated HCWs are expected to have better knowledge level. One study in China has also shown that education level is important determinant

of knowledge level but in a study done in Addis Ababa level of education, type of profession (being nurse) and area of practice (being in surgical unit) were found to have significant association with knowledge score which were not found to be associated in this study.

Practice about hepatitis B infection

HCWs are at risk of acquiring blood borne disease including HBV due to occupational exposure to blood and body fluids. From 295 HCW s who responded to the question whether they had history of occupational exposure to blood or body fluids or not, 139 (47.1%) reported history of occupational exposure. This indicates high level of occupational exposure to hepatitis B and other blood borne pathogens.

Even though 55.9 % of respondents of this study that they were using additional infection control precautions while caring for hepatitis B patient (29), the number increases in a study conducted in Guilan University Iran up to 70.5 this could mainly be due to lack of infection prevention supplies.

The circumstances leading to exposure may be dictated by working environment and certain job related practices. In quantitative study, respondents frequently picked out being busy and rushing at work as contributing factors for exposure to HB infection. Most frequently taken measure after occurrence of the exposure was found to be washing the injury with antiseptics and water (49.5%), while up to 16.2% of them had checked the status of the patient. This shows there is some knowledge gap about measures to be taken after being exposed to hepatitis B. Occupational exposures almost go undocumented in many developing countries. Similarly, in this study immediate reporting was practiced only by 27.4% of the respondents. This is inconsistent to CDC's recommendation which states all HCWs should report after sustaining the injury. Which would make taking post exposure prophylaxis difficult unless reported.

In this study participants didn't get hepatitis B vaccine, while only 48.5% of the total study subject were vaccinated, among these only 35.6% of them had complete the full dose of the vaccine. A study conducted in Brazil shows 79.9% and 62.2% of the study participants had receive vaccine and completed the full dose respectively. Also in a study conducted in India 78.2% 72.0% of the study subjects had received the vaccine and complete the dose respectively (25). Here in our continent south Nigeria a study revealed that 70.2% of the study participants received hepatitis B vaccine (28). But in contrary in a study done in Addis Ababa university the total amount of

participants who were vaccinated were only 5.8% and the one fully vaccinated were only 8.3% of the vaccinated ones which is a very low number compared to this study the explanation for this is the study participants were mostly nursing students and due to un-affordability of the vaccine for the students and lack of free access of it.

Among the reason for not being vaccinated which is answered by the majority of the study subjects who didn't take the vaccine, unavailability of the vaccine is chosen by most (30.3%) of the study participants and the other reason was the cost of the vaccine being expensive (24.5), this can be an indicator that low vaccination status can be due to lack of access and expensiveness. Contrary to this figure forgetfulness (50%) and having no reason are the most frequently answered choices as a reason for not being vaccinated in a study conducted in Brazil and Nigeria respectively (18,21)

Overall practice of the study participants 64.7% had a good practice and 35.3 had a poor practice regarding hepatitis b and based on their vaccination status 35.4% are fully vaccinated and 64.6% of the workers are not fully vaccinated.

As far as determinants of practice score is concerned, the only determinants which were found to have significant association with overall practice are sex of participants and current working departments of participants.

This study revealed that the knowledge score was significantly associated with practice, was also significant predictors of vaccination status as well. In study conducted in Botswana stands in contrast with what was found in our study; where positive attitude and good knowledge were found to be a significant predictors of vaccination status. But in contrary one study from Nigeria showed that knowledge on risk of contracting HBV did not have any influence on vaccination status. Good knowledge does not necessary translate into good attitude; by the same token, attitude of HCWs may not always be proportional to vaccination since availability of the vaccine may dictate vaccination status more however from this study there is a relation between knowledge of the vaccine and vaccination status of the participants implying that working on the knowledge of HCWs will increase their vaccination status.

STRENGTH AND LIMITATION OF THE STUDY

Strength of the study

- The utilization of appropriate statistical methods to minimize biases was made and the data was analyzed using appropriate statistical test.
- There are no studies on HCWs especially at health center level making this the first research and pioneer for others coming.

Limitations of the Study

- As in any other studies, there are some potential limitations in our study that should be considered when interpreting the results. First, in cross-sectional study, all factors (outcome and its determinant) are measured simultaneously; therefore, no temporal relationship between variables and outcomes can be ascertained.
- There was also probability of volunteer bias, where non-responders may have had lower knowledge and practices in comparison to responders, and thus would not be interested in participating.

CONCLUSION AND RECOMMENDATIONS

Conclusion

In this study much more than half of the respondents had good knowledge and good practice towards hepatitis B. which generally have a great impact on the population they are serving and they will serve in the future and there are some areas of KAP of HCPs need to be corrected or improved. Areas where HCPs had knowledge deficiencies were: whether HBV infection is curable or not, number of doses of the vaccine required for complete protection, expected interval between the doses of the vaccine, the effectiveness of the vaccine when used as PEP, and requirement of post-vaccination serological testing. Knowledge score was significantly associated with education level.

When it comes to vaccination of hep B from the demographic variables sex was strongly associated with it and also current working department of the participant had association. Vaccination status was significantly associated knowledge and there was statistically significant association between knowledge and practice as well.

Lastly it is of great important that the health care workers who are working in a lower health care system have a lot of contact with the community than the higher institutes in the health system so HCWs having a good knowledge and practice is for the community they are helping. Also at these facilities not just in the rural area but the capital city there is the issue of the vaccine not being available which should be looked at by the ministry of health.

Recommendations

Based on the finding from this study, the following recommendations are made.

For Ministry of Health

- Governmental and non-governmental organizations need to consider expanding the currently available prevention facilities including the availability of the vaccine and put in place sustainable infection control and prevention strategies. The vaccine should be available in a lowest possible price for government health organization.
- Training of HCW's on proper uses of PPEs as well as safe handling and proper disposal of potentially infectious fluids and devices would be important to reduce occupational HB transmission.
- It would be much helpful if awareness creation activities like disseminating important information on HBV infection and its vaccination are done, especially in areas where HCPs had knowledge deficiencies
- It is important to look into ways of making anti-HBs testing available for all healthcare workers, especially those who are at a greater risk of exposure to blood or other potentially infectious material.
- Give sufficient coverage about hepatitis B prevention and control issues through different Medias like television, radio and magazines.

For health sector authorities at sub city level

- Each sub city should work on preparing Hepatitis B training package to mainstream hepatitis B related issues to health care professionals including nurses, health officers, lab technicians, including cleaners and administrative bodies and also other concerning stakeholders.
- When vaccine is made available in the country by ministry of health helping by distributing to the level of small health centers.

For Researchers

- Further study should be conducted in other level of health care settings and other part of the country so as to have broader understanding of KAP of the HCPs.
- A study which assesses KAP of the large community not just HCWs towards hepatitis B and their determinant factors is recommended to be undertaken.

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Annex I

English version of verbal consent format for key informants

Greetings!

My name is Dr. Habtamu Tamiru I'm an intern at SPHMMC soon to be graduating I'd like to give you this questionnaire to you and gain some insight about the current status of vaccination among HCWs in your department/ward with special emphasis to factors that can affect their vaccination status. I am asking you for a little of your time, only about 10-15 minutes. Your participation in this interview is fully based on your consent. However, your information is very important for the study. The information provided in this interview will be used for the research purpose only and strictly kept confidential. No identifiers will be used in the documentation process of the interview and in case there is any information that may identify you, they will be kept under strict confidence.

Are you willing to participate in this study?

Thank You!

Annex II

Questioners

I. Socio-demographic and occupational characteristics of the respondent (circle your answers)

1. Your age

2. Sex

A. Male

B. Female

3. Your current marital status

A. Married

B. Single

C. Divorced/Separated

D. Widowed

4. What is your religion?

A. Orthodox

D. Protestant

B. Muslim

E. Other, specify _____

C. Catholic

5. What is your profession?

A. Nurse

D. Midwives

B. Health officer

E. Dentist/Dental technician

C. Lab. Technologist/Technician

F. Cleaners

G. Other/specify.....

6. Your educational level?

A. Certificate

D. Master's Degree

B. Diploma

E. Specialist/specify the

field_____

C. First Degree

7. In which department are you working currently?

A. Surgical department

C. Delivery unit

B. Laboratory

D. Emergency department

8. Work experience as health care professional

-----years

9. Have you ever attended training on infection prevention?

A. Yes

B. No

II. Participant knowledge on HBV infection and its vaccination

1. Have you ever heard/read about Hepatitis B Virus?

A. Yes

B. No

2. What is your source of information? (Multiple answers are possible)

A. Training

D. Friends

B. Mass media

E. Internet

C. Formal education/school

F. Other/specify.....

3. Can you get HBV infection through percutaneous injury?

A. Yes

B. No

C. I don't know

4. Is blood infectious body fluid?

A. Yes

B. No

C. I don't know

5. Is vaginal fluid infectious body fluid?

A. Yes

B. No

C. I don't know

6. Is urine infectious body fluid?

A. Yes

B. No

C. I don't know

7. Is hepatitis B curable disease?

A. Yes

B. No

C. I don't know

8. How many doses of HB vaccine required for complete protection?

9. What is expected interval between the first dose and the dose next to it in month?

10. What is expected interval between the last dose and the dose preceding it in month?

11. If the vaccine is taken after exposure does it reduce the likelihood of being positive for HBV?
A. Yes
B. No
C. I don't know
12. For HCWs who have completed their vaccine series, should their immunity status be checked (anti-HBs serologic testing should be done)?
A. Yes
B. No
C. I don't know
13. If their immunity test result is negative does the vaccine series need to be repeated
A. Yes
B. No
C. I don't know

III Participant practice related to occupational exposure of HBV and its vaccination

1. Have you ever been exposed to HBV risky conditions? (Percutaneous injury or mucous membrane contact with infectious fluid)
A. Yes
B. No
C. I do not remember
2. If yes to the above question what factor contributes to the exposure? (multiple answer is possible)
A. Lack of infection prevention sup-plies
B. Being busy
C. Rushing at work
D. Careless handling of the patient or infectious materials

- E. Others/specify.....
3. If yes for question no 2, what sort of post exposure preventive measures did you take?
- A. Immediately reporting C. Allow injury to bleed
B. Know about patients' disease D. Other/specify
4. Do you often use additional infection control precautions when you caring for patients with Hepatitis B
- A. Yes
B. No
C. I don't know
5. Do you were gloves in contact with hep B patients?
- A. Yes
B. No
C. I don't know
6. Have you ever received hepatitis B Vaccine?
- A. Yes
B. No
C. I do not remember
7. Reason for not being vaccinated (for unvaccinated only)
- A. Cost of the vaccine E. Vaccination is not necessary
B. The vaccine is not easily available F. Lack of information
C. Afraid of vaccine's side effect G. Afraid of needles
D. Too busy H. Other/specify.....
8. Have you received full course of vaccination?
- A. Yes
B. No
C. I don't remember
9. If your answer is No to questions no 6, what was reason for not receiving full course of vaccination?
- A. Fear of adverse effects C. Afraid of needles
B. Assuming that it was enough D. Other/ specify.....
C. Being busy

