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Declaration

I, the undersigned, declare that this thesis is my original work and has not been presented for a degree in this or another university and all the sources of materials used for this thesis have been fully acknowledged.

Name Tigist Belete (BSc)

Signature----------

Date----------

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

Name Professor Fikre Enquselassie

Signature----------

Date----------

Acknowledgement

First of all praise to God, who makes everything done in his appropriate time.

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Acronyms

BBP	Blood Borne Pathogens
HBeAg	Hepatitis B e Antigen
HBV	Hepatitis B Virus
HBsAg	Hepatitis B Surface Antigen
HCWs	Health Care Workers
PEP	Post Exposure Prophylaxis
SPSS	Statistical Package for Social Sciences
STD	Sexually Transmitted Disease
TASH	Tikur Anbessa Specialized Hospital
WHO	World Health Organization

Abstract

Background: People at high risk for Hepatitis B virus (HBV) include health care workers (HCWs) in contact with blood and human secretions. 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%. However, little is known about the utilization of the vaccination among health care professionals in Ethiopia.

Objective: To assess hepatitis B Vaccine utilization and potential factors for not getting vaccinated among health care professionals at Tikur Anbessa specialized hospital, 2016

Methods: Facility based cross-sectional study was conducted at Tikur Anbessa Specialized Hospital among five categories of health professionals (doctors, nurses, laboratory technicians, anesthetists and midwives), selected using systematic random sampling technique. Sample size was calculated to be 406 based on prevalence of previous studies. Data was collected using pre-tested, structured self-administered questionnaires. The data was entered in to Epi-data version 3.1 and analyzed using SPSS version 20. Descriptive statistics was employed to describe the study participants by socio-demographic, behavioral and health service factors. The strength of association was computed using odds ratio and described with crude and adjusted odds ratio. Furthermore, bivariate and multivariate binary logistic regression analyses were used to identify the significant associations. Statistical significance was declared at p- value< 0.05.

Results: A total of 394 health care professionals participated in this study with response rate of 97%. Among them only 88(22.3%) have ever received hepatitis B vaccine. Age groups 30-34 [AOR:21.1,95%CI(3.6-125.5)] and 35-39 [AOR:18.6,95%CI(3.14-109.9)], educational status [AOR:0.14,95%CI,(0.02-0.95)], marital status [AOR:0.24,95%CI,(0.16-0.49)], identification of patients with hepatitis B [AOR:0.5,95%CI(0.25-0.88)], hand washing as infection prevention precaution [AOR:0.2,95%CI(0.09-0.42)] and exposure of health care professionals to patients with hepatitis B [AOR:0.21,95%CI(0.09-0.47)] were found to be significantly associated with hepatitis B vaccine utilization.

Conclusion and Recommendation: This study showed that percentage of health care professionals who were tested for hepatitis B and who took hepatitis B vaccination is very low. This is a serious public health scenario and challenge for a country with high prevalence of hepatitis B infection. There is a need to promote hepatitis B virus screening and vaccination among health care professionals and government should play its part by increasing health care budgets and put priority on hepatitis B prevention by establishing a national awareness campaign, spreading screening and vaccination services all over public hospitals.

1. Introduction

1.1 Back ground

Hepatitis B infection is a potentially life-threatening blood born liver infection caused by hepatitis B virus (HBV). It can cause chronic liver disease and chronic infection and puts people at high risk of death from cirrhosis of the liver and liver cancer (1). It is the tenth leading cause of death among all diseases worldwide (2), and the fifth leading cause of death from infectious diseases worldwide, surpassed only by lower respiratory tract infections, diarrheal diseases, Human Immuno deficiency Virus/ Acquired Immuno-Deficiency Syndrome (HIV/AIDS) and Tuberculosis (3).

HBV is concentrated most highly in blood with low concentration in certain body fluids, such as semen, vaginal secretions and saliva of persons infected with HBV. Person-to-person spread of HBV can occur among those living with someone chronically infected with hepatitis B. It is mainly spread by sexual contact with an infected person, sharing needles during injection drug use; occupational needle sticks or sharps exposure, or transmission from an infected mother to her baby during birth (4).

People at high risk for HBV include health care workers (HCWs) in contact with blood and human secretions, haemodialysis 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 (5).

An exposure that might place health care professional at risk for HBV is defined as a percutaneous injury (a needle stick or cut with a sharp object) or contact of mucous membrane or non-intact skin with blood, tissue, or other body fluids that are potentially infectious: cerebro spinal fluid (CSF), synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid and amniotic fluid are also considered potentially infectious (6).

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% (1). Primary vaccination consists of more than three doses of hepatitis B vaccine administered intramuscularly

with the interval of one month between the first and the second dose and six months between the second and the third dose produces a protective antibody response in approximately 30%–55% of healthy adults aged less than 40 years after the first dose, 75% after the second dose, and greater than 90% after the third dose (7).

1.2 Statement of the problem

Hospital acquired infections are problems in both developed and developing countries and are important causes of death (8). HCWs are potentially exposed to blood and body fluids containing transmissible diseases and are at increased risk to acquire these pathogens (9, 10). Hepatitis B is blood borne pathogen, which might be acquired occupationally. Occupational exposure to blood and body fluids occur frequently among health professionals (10, 11).

The most serious occupational health hazard faced by HCWs worldwide is exposure to blood-borne pathogens; these blood-borne pathogens are mainly Hepatitis B, C, and HIV infections (2).Hepatitis B is by far the most dreaded and more infectious than the other blood-borne pathogens, it is 100 times more contagious than HIV/AIDS. The estimated risk of a single needle stick injury indicate a risk of 300 hepatitis B virus infection (30% risk), 30 hepatitis C virus infection (3% risk) and 3 HIV infection (0.3% risk), per 1,000 respective exposures (12). Hepatitis B is an important occupational hazard for health workers since they are at increased risk of acquiring it due to occupational exposure. Health care professionals do not recognize all exposures to potentially infectious blood or body fluids and, even if exposures are recognized, often do not seek post exposure prophylactic management (5, 6).

A serologic study conducted in the United States found that, HCWs had a prevalence of HBV infection approximately 10 times higher than the general population (9). The World Health Organization (WHO) report estimates that 40% of HBV infection is as a result of occupational exposure, it has been estimated that 14.4% of hospital workers are infected with HBV. Nurses were most commonly exposed to infection (41%) than other HCWs (13).

A cross sectional study conducted on 267 HCWs of Tikur Anbessa specialized hospital and Ras Desta Damtew memorial hospital reported that the overall prevalence of HBV infection was found to be 51.3%, by taking Hepatitis B surface antigen (HBsAg) and Anti HBc as the only marker of infection(14).

HBV can be prevented by currently available safe and effective vaccine. A vaccine against hepatitis B has been available since 1982. The vaccine is 95% effective in preventing infection and the development of chronic disease and liver cancer due to hepatitis B. But many health care workers in developing countries are not vaccinated.

Hepatitis B infection is still a major public health problem in Ethiopia. A study done in Bahir Dar city administration to assess knowledge and vaccination status of health care workers showed that from a total of 370 respondents, only 20(5.4%) reported that they took three or more doses of hepatitis B vaccine (15). There is scarcity of studies done to assess hepatitis B vaccination status of health professionals and the reason for not getting tested and the studies done gave much focus to the serologic status of the virus rather. Tikur Anbessa specialized hospital is the only tertiary hospital with large flow of patients from all over the country including from other referral hospitals and a place of practice for significant number of health care professionals. Therefore, this study will assess hepatitis B vaccination status of health care professionals and the reasons for not vaccinating in the selected hospital health care workers and it will try to fill the gap of knowledge exists on the area.

1.3 Significance of the study

While Hepatitis B vaccine utilization is universally accepted as an important strategy to decrease the transmission of HBV all over the world and in developing countries like Ethiopia, the rate of infection is still increasing.

Knowing the magnitude of utilization and factors responsible for low utilization of Hepatitis B vaccine among HCWs at Tikur Anbessa Specialized hospital will help policy makers, program designers and implementers to design a tailored intervention that focuses on elimination and or reduction of such obstacles to increase Hepatitis B vaccine utilization among HCWs.

Therefore, this study will help to show the gap of service utilization practice. The results of this study will further assist the clinical facilities managers, governmental and non-governmental organizations in collaboration with Ministry of Health to be aware of the extent of vaccination uptake, and develop strategies for promoting awareness creation and improving HBV immunization uptake among HCWs. The end results of this study can also be used as a baseline data for further studies.

2. Literature Review

2.1 Overview of HBV

Hepatitis B virus was discovered in 1965 when Blumberg and co-workers found the Hepatitis B surface antigen which was originally called the Australia antigen because it was found in serum from an Australian patient. A few years later, Dane (1970) visualized the HBV(16). HBV is a 42-nm DNA virus classified in the Hepadnaviridae family. The liver is the primary site of HBV replication. After a susceptible person is exposed, the virus enters the liver via the blood stream. HBV infection can produce either asymptomatic or symptomatic infection. The average incubation period is 90 days from exposure to onset of jaundice and 60 days from exposure to onset of abnormal serum alanine aminotrans- ferase (ALT) levels(17).

The onset of acute disease typically is insidious. Infants, children aged <5 years, and immunosuppressed adults with newly acquired HBV infection typically are asymptomatic, whereas 30%–50% of children aged >5 years and adults have initial clinical signs or symptoms. When present, clinical symptoms and signs can include anorexia, malaise, nausea, vomiting, abdominal pain, and jaundice. Extra-hepatic manifestations of disease also can occur (17). The fatality rate among persons with reported cases of acute hepatitis B is 0.5%–1.0%, with the highest rates in adults aged >60 years; however, because a substantial number of infections are asymptomatic and therefore are not reported, the overall fatality rate among all persons with HBV infection likely is lower (18).

Approximately 95% of primary infections in adults with normal immune status are self-limited, with elimination of virus from blood and subsequent lasting immunity to reinfection. Chronic infection occurs in less than 5% of infected persons aged above 5 years. Approximately 30% of infected children aged less than 5 years, and approximately 90% of infected infants, with continuing viral replication in the liver and persistent viremia. Primary infections become chronic more frequently in immunosuppressed persons. Overall, approximately 25% of persons who become chronically infected during childhood and 15% of those who become chronically infected after childhood die prematurely from cirrhosis or liver cancer; the majority remain asymptomatic until onset of cirrhosis or end-stage liver disease (17).

HBV is transmitted by percutaneous or mucosal exposure to infectious blood or body fluids. Although HBsAg has been detected in multiple body fluids, only serum, semen, and saliva have been demonstrated to be infectious. All HBsAg-positive persons are infectious, but those who are also hepatitis B e antigen (HBeAg) positive are more infectious because their blood contains high titers of HBV. HBV is comparatively stable in the environment and remains viable for more than 7 days on environmental surfaces at room temperature. For adults, the two primary sources of HBV infection are sexual contact and percutaneous exposure to blood. Person-to-person transmission of HBV also can occur in settings involving nonsexual interpersonal contact over an extended period (17).

Percutaneous transmission of HBV can occur from receipt blood transfusion or organ or tissue transplant from an infectious donor; injection-drug use, including sharing of injection-preparation equipment; and frequent exposure to blood or needles among health-care workers. Outbreaks of HBV infection from exposure to contaminated equipment used for therapeutic injections and other health care related procedures, tattooing and acupuncture also have been reported, although such exposures among patients with acute hepatitis B are reported rarely. Persons living with chronically infected individuals are also at risk for HBV infection through percutaneous or mucosal exposures to blood or infectious body fluids. Persons with chronic HBV infection also can transmit HBV in other settings especially if they behave aggressively or have medical problems that increase the risk for exposure to blood or serous secretions (17).

2.2 Epidemiology of HBV

The Hepatitis B Foundation estimates that there are more than 2 billion people infected with HBV, of whom about 400 million are chronically infected and approximately 10-30 million people become infected and 1 million die from HBV induced liver disease per year, which equates to about 2 HBV related deaths occur per minute worldwide (19).

HBV infection prevalence varies markedly in different geographical areas of the world, as well as in different population subgroups. It ranges over 10% in some Asian and Western Pacific countries to under 0.5% in the United States and northern European countries (2).

The WHO has therefore demarcated the world according to chronic hepatitis B prevalence into three major blocks which include high, intermediate and low prevalence. High prevalence areas

have a prevalence of chronic hepatitis B infection that is 8% and above made up of countries with large population from North America, South America, Sub-Saharan Africa and most Asian countries where at least 8% of the population are HBV chronic carrier and 70–95% of the population shows past or present serological evidence of HBV infection (2). Ethiopia, being part of this region, is ranked as an area with medium to high endemicity for HBV infection, based on previous population surveys (20). Intermediate prevalence areas have a prevalence rate which ranges between 2% and 7% and include countries from South America, North Africa, Western Europe, Eastern Europe and the Indian subcontinent. Between 10-60% of the population have evidence of infection; 2-7% is chronic carriers. Low prevalence areas are estimated to have a prevalence of chronic infection less than 2% which includes most of the North American countries, Australia and most of Western Europe including the United Kingdom. Overall, approximately 45% of the global populations live in areas of high chronic HBV prevalence (2).

Hepatitis B transmission route varies according to the prevalence rate of the virus. Countries with very high prevalence rate usually have vertical transmission as the main route of transmission which is mostly found during childhood. Countries with intermediate prevalence rates normally have horizontal transmission as its major route where the disease is transmitted through sexual contact or through injecting of drugs. In countries with low prevalence rates the epidemic is mostly acquired during adulthood through sexual intercourse or injecting of drugs. In regions of the world where hepatitis B is highly endemic, HBV accounts for around 3% of the total mortality (21).

The burden of chronic carriage falls predominantly in Asia where 75% of chronic HBV carriers live. Africa has the second largest number of chronic carriers. Approximately 470 million people living in Africa, about 50 million are lifetime carriers of the virus and as many as 12.5 million will eventually die due to hepatitis B induced liver disease (22).

In Africa, infections with HBV play a major role in the etiology of most liver diseases. The WHO African region includes all of Sub-Saharan Africa estimated HBsAg seroprevalence ranges between 5% and 19% which falls into the high endemicity category. In Ethiopia as in other Sub-Saharan Africa, the prevalence of liver disease is high accounting for 12% of the hospital admissions and 31% of the mortality in medical wards of Ethiopian hospitals (23).

A nationwide sero-epidemiological study of hepatitis B markers prevalence was conducted in Ethiopia on 5,270 young males from all regions of the country, the overall prevalence rates were 10.8% for HBsAg and 73.3% for "at least one marker positive" (24).

The prevalence of HBV markers has also been studied among blood donors and the HBsAg carrier rate was found to be 11% with a total HBV infection rate of 79%.Tthe predominant form of HBV transmission in Ethiopia found to be horizontal interfamilial spread (25).

A community based seroprevalence study in the capital city of Ethiopia; Addis Ababa has shown a 7% seroprevalence of HBsAg, higher in males than females. The age at which 50% had evidence of infection was around 20 years (26).

The most effective and feasible means of preventing HBV infection is by vaccination and avoidance of exposure to blood. The first hepatitis B vaccine was created in 1982. The vaccine was initially by means of a plasma-derived HBsAg subunit which has largely been replaced by recombinant derived ones, which were introduced in 1986. In 1991, the WHO recommended that Hepatitis B vaccine should be introduced into the Expanded Programme of Immunization (EPI) (2, 27).

Complete vaccination against hepatitis B is achieved by administration of a three-dose regimen, with the second and third doses being given one and six months after the initial dose. A test for HBsAg should be carried out 6–8 weeks following the final dose of the primary course of vaccination. Antibody levels of over 100miu/mL indicate a good response to vaccination. Antibody levels between 10 and 100miu/mL indicate a poor response and a booster dose should be given immediately to improve response. A blood test should be carried out 6–8 weeks after the booster dose to check response (27).

Despite the fact that since 1982 there is a vaccine against HBV that gives 90-100% protection against the infection; HBV is continuing to be the major diseases of mankind and serious global public health problem (18).

2.3 Magnitude of Hepatitis B infection among health care professionals

HCWs are at risk of acquiring blood borne disease including HBV due to occupational exposure to blood and body fluids (28-30). WHO estimated that, of the 35 million HCWs world-wide, 3

million experience percutaneous exposures to blood pathogens each year, of these 2 million are exposed to hepatitis B virus (29-31). The WHO estimates a high global burden of 40% for hepatitis B among HCWs (32). Working in health care has long been recognized as a risk for HBV exposure. Studies from the 1980s and 1990s showed that up to 28% of health care personnel (HCP) had serologic evidence of past or current HBV infection (33).

A training programme for prevention of occupational exposure to blood borne pathogens: impact on knowledge, behavior and incidence of needle stick injuries among student nurses in Changsha, People's Republic of China found out that nursing personnel experience a higher rate of workplace exposure than other HCWs. High risk percutaneous exposures are most frequently reported by nurses, most likely because nurses perform more bedside procedures than other workers. Chinese HCWs have higher rates of HBV and tuberculosis infection than the general population. Nurses working in central supply rooms, who are responsible for collecting, cleaning and sterilizing reusable equipment, have a high risk of exposure to infectious diseases (34).

2.4 Hepatitis B vaccination among health care professionals

Health care workers are at a high risk of HBV infection through occupational exposure to blood, and the incidence of this infection among them has been estimated to be 2-4 times the level in the general population (11). As part of occupational safety measures, all health care workers are required to be vaccinated against HBV. Unfortunately, WHO has estimated that HBV vaccination coverage amongst HCWs is only 18-39% in low and middle-income countries compared to 67-79% in high-income countries (35). Hepatitis B vaccination coverage among health care personnel in the United States showed that overall, 69.5% and 63.4% of HCP reported receiving one and three doses of Hepatitis B vaccine respectively which remained below the healthy people 2010 coverage goal of 90% (33).

A study done among health care workers of a tertiary care center in North India revealed that an average of 60% of health care workers had taken the three doses of the hepatitis B vaccine. Only 40% of the health workers had received the full three dose vaccination schedule while 20% had received one or two doses, and 40% were unvaccinated. The most common (45%) reason cited for not taking the recommended number of dosage was the lack of knowledge about the total number of doses to be taken for full protection. About 28% of the participants could not complete immunization schedule as they did not get time, while 22% forgot that they were to

receive other doses too. About 36% of them were not interested in spending any money on vaccination, so they cited the reason for incomplete immunization as unavailability of vaccine through government channel (36).

In a study done in Kuwait among primary health care workers, about three quarters of the respondents (74.7%) have actually ever received Hepatitis B vaccine. Among them, only 84.0% completed the vaccination doses. Within those who have never received any dose of vaccine, 79.3% gave no specific reason for that (37). Similarly, a study done in Gauteng province North Africa reported that the majority of HCWs 72% has been vaccinated against HBV, but only 61.2% of those vaccinated had received all 3 doses of the vaccine. Of those vaccinated, only 27.6% (32/116) had their immunity checked and 93.75% (30/32) stated they were protected (38).

Hepatitis B Immunization amongst doctors and laboratory personnel in KwaZulu-Natal, South Africa was studied. Of the 67 doctors who reported an occupational injury, 26 (39%) had no HBV immunity and only 19% (5 out of 26) had received Hepatitis B immunoglobulin. Fifty six percent of HCWs were not aware of their immune status. Furthermore only 22% had received a booster within 5 years of their last immunization and 78% had received their booster after five years or not at all (39).

A study done among operating room personnel in Nigeria and 61 respondents (26.8%) had been vaccinated while 167 respondents had not been vaccinated. Of the 167 respondents, 103(61.7%) had not commenced vaccination, 55 (32.9%) started vaccination and defaulted and 9 (5.4 %) were in the process of receiving vaccinations and awaiting further courses. Among those that were completely vaccinated, 29 respondents had undergone antibody testing which showed good response to vaccination whereas 32 respondents defaulted on antibody test after vaccination (27).Another study done in north central Nigeria on primary health care workers also reported low vaccination status. Only 52(19.8%) out of the 263 who responded to the question on vaccination status had been vaccinated. As many as 150 (71.1%) of those who were not vaccinated attributed it to “lack of vaccine for adults” (40).

A research conducted in south Nigeria to assess health workers’ knowledge, attitude and behavior towards hepatitis B infection, 70.2% of the respondents have actually ever received Hepatitis B vaccine while only 59.4% completed the vaccination schedule. Among those who

did not receive HBV vaccine 44.4 % had no any reason and 22.2% mentioned they are busy as a reason for not to be vaccinated (41). Similarly, the research findings of a study conducted to assess knowledge and utilization of Hepatitis B infection preventive measures and influencing factors among health care workers in Ibahan, Nigeria showed that 34.8% were screened for Hepatitis B virus and 65.7% were vaccinated against hepatitis B virus (42).

Hepatitis B vaccination uptake among doctors studied in Benin City, Nigeria showed that 162 (50.6%) of the respondents had received hepatitis B vaccination while 158 (49.4%) did not receive the vaccination. Among these 162 respondents, 116 (71.6%) had completed vaccination while 46 (28.4%) of them had not completed the three doses required for complete vaccination. Based on reasons given for non-completion of vaccination, 35(78.3%) of doctors reported pressure of work, 33(71.7%) due to missed doses, 19(41.3%) due to change of location, while 11 (23.9%) due to unavailability of Hepatitis B vaccines (43).

A study on needle-stick injuries (NSIs) and splash exposures among health care workers at tertiary care hospital in north-western Tanzania was done. Out of 436 HCWs who participated in the study, 212 (48.6%) reported incidents of NSIs and splash exposures within the previous 12 months. However, majority of HCWs, 185 (87.3%) were not adequately immunized for hepatitis B virus and only 17 (8.0%) were fully vaccinated, having received three doses of the vaccine (44).

Another study on epidemiology of needle stick-sharp injuries and potential high risk exposures among health professionals in Ethiopia revealed that of the total study participants, 9(3.5%) of respondents were vaccinated against hepatitis B virus infection. The study declared that exposure for potentially infectious body fluids including blood, needle stick injuries, sharp injury and other risk factors was high. But, only very small percentages of health professionals were partially vaccinated for HBV (45).

Hepatitis B vaccine knowledge and vaccination status among health care workers of Bahir Dar City Administration, Northwest Ethiopia was studied and it was found that of the total respondents, 370 responded to the question whether they were vaccinated or not at the time of interview. Only thirty seven (10%) respondents reported that they received one or more doses of hepatitis B vaccine. From these, only 20 (54%) received three or more doses which was only

5.4% of the total HCWs. Among 333 respondents who were not vaccinated, 201(60.36%) and 133 (39.93%) reported that the vaccine was not available and costly respectively (15).

In summary, although burden and risk of acquiring HBV remains high in sub-Saharan Africa the vaccination status of HCWs is very low and the reasons for not vaccinating differs from place to place. Therefore it is timely to conduct further study on the vaccination status of HBV among HCWs in Ethiopia so that strategies and policies can be developed to prevent HBV.

2.5 Conceptual Framework

The conceptual framework is adapted from different literatures. It showed that factors such as, socio-demographic, behavioral and health service factor are considered to affect hepatitis B vaccine utilization among health care professionals. In this frame work, socio-demographic factors influence behavioral and health service factors and behavioral factors also influence health service factors. These all factors in turn influence the utilization of hepatitis B vaccine. Socio-demographic factors like age, sex, educational status, religion, current marital status, monthly income, job category, work experience and current unit of work affects the individual's behavior towards hepatitis B vaccine utilization. Behavioral factors like negligence, work load and not feeling at risk affects hepatitis B vaccine utilization. And health service factors like availability and accessibility of the vaccine and cost influences hepatitis B vaccine utilization.

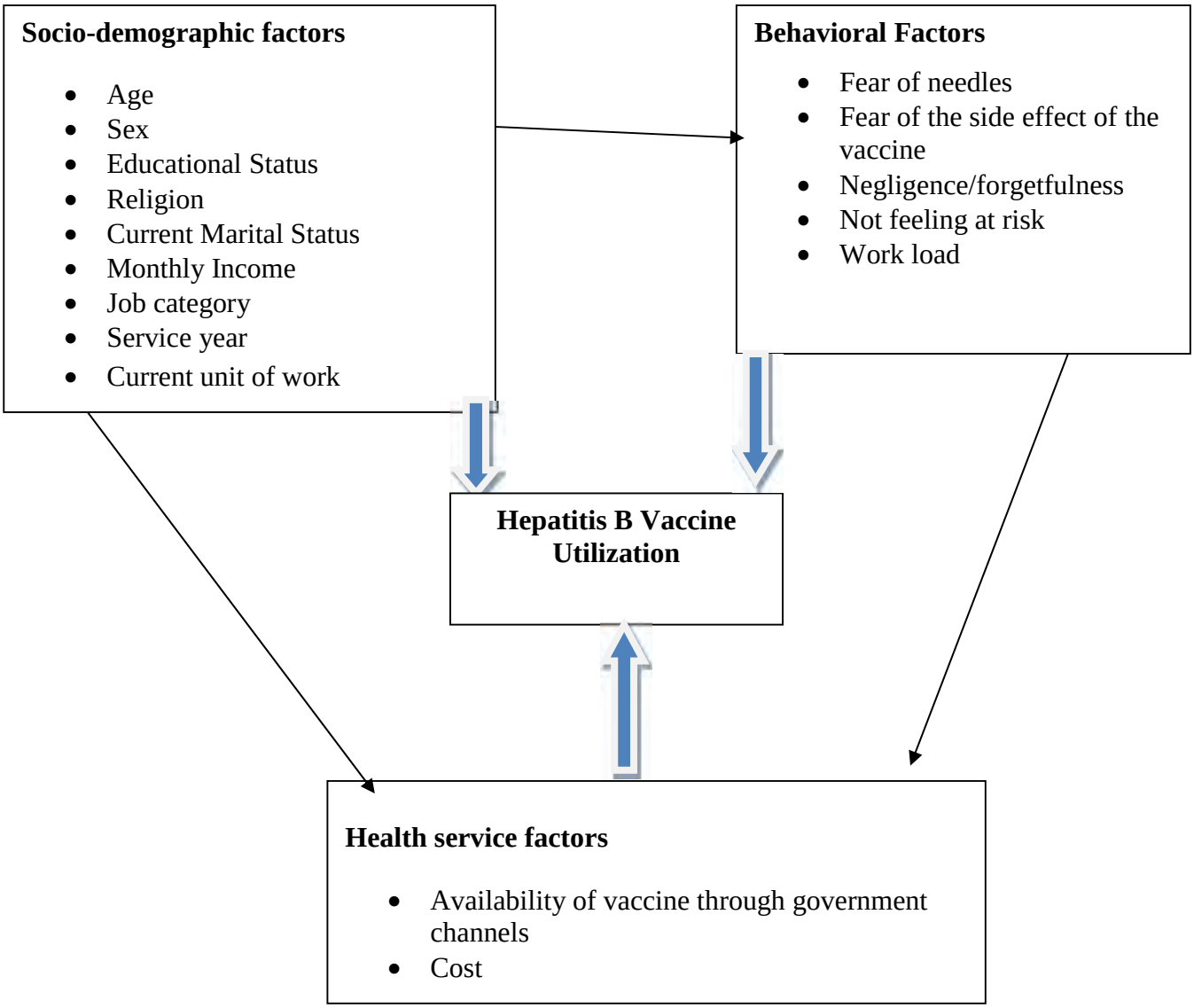

Figure 1: Schematic presentation of conceptual frame work on factors affecting Hepatitis B vaccine utilization

3. Objective

3.1 General Objective

To assess hepatitis B Vaccine utilization and potential factors for not getting vaccinated among health care professionals at Tikur Anbessa specialized hospital, 2016

3.2 Specific Objectives

3.2.1. To determine the magnitude of utilization of hepatitis B vaccine among health care professionals at Tikur Anbessa Specialized Hospital.

3.2.2. To assess potential factors for not getting vaccinated among health care professionals at Tikur Anbessa Specialized Hospital.

4. Methods

4.1 Study area and period

The study was conducted at Tikur Anbessa Specialized hospital; from March to April 2016. The hospital was selected because it is the only largest tertiary hospital with large flow of patients from all over the country including from other referral hospitals and it has the only cancer care unit, cardiac center, diabetic clinic and a place of practice for significant number of health care professionals. The hospital has 200 staff doctors, 688 nurses, 32 anesthetists, 51 laboratory technicians and 22 midwives.

4.2 Study Design

A facility based cross sectional quantitative study design was used to assess hepatitis B vaccine utilization and possible reasons for not getting vaccinated among selected health professionals at Tikur Anbessa specialized hospital, Addis Ababa.

4.3 Population

4.3.1 Source population

The source population was all staff doctors, nurses, anesthetists, laboratory technicians and midwives who are working at different units of Tikur Anbessa specialized hospital. The above health care professionals are selected because they have frequent contact with blood and body fluids of patients and considered to be at higher risk of acquiring HBV.

4.3.2 Study population

The study population was the selected staff doctors, nurses, anesthetists, laboratory technicians and midwives who are working at both major and minor operation room, both adult and pediatric emergency outpatient department, medical ward, surgical ward, pediatrics ward, labor ward, oncology ward, orthopedic operation room and ward, laboratory and intensive care units of Tikur Anbessa specialized hospital during the data collection period.

4.3.3 Inclusion and Exclusion Criteria

4.3.3.1 Inclusion criteria

-Health professionals who are doctors, nurses, clinical laboratory technologists, Anesthetists and midwives

- All should be staffs of the hospital

$$m = \frac{(\approx_{e,f2})^2}{d^2} \cdot pq$$

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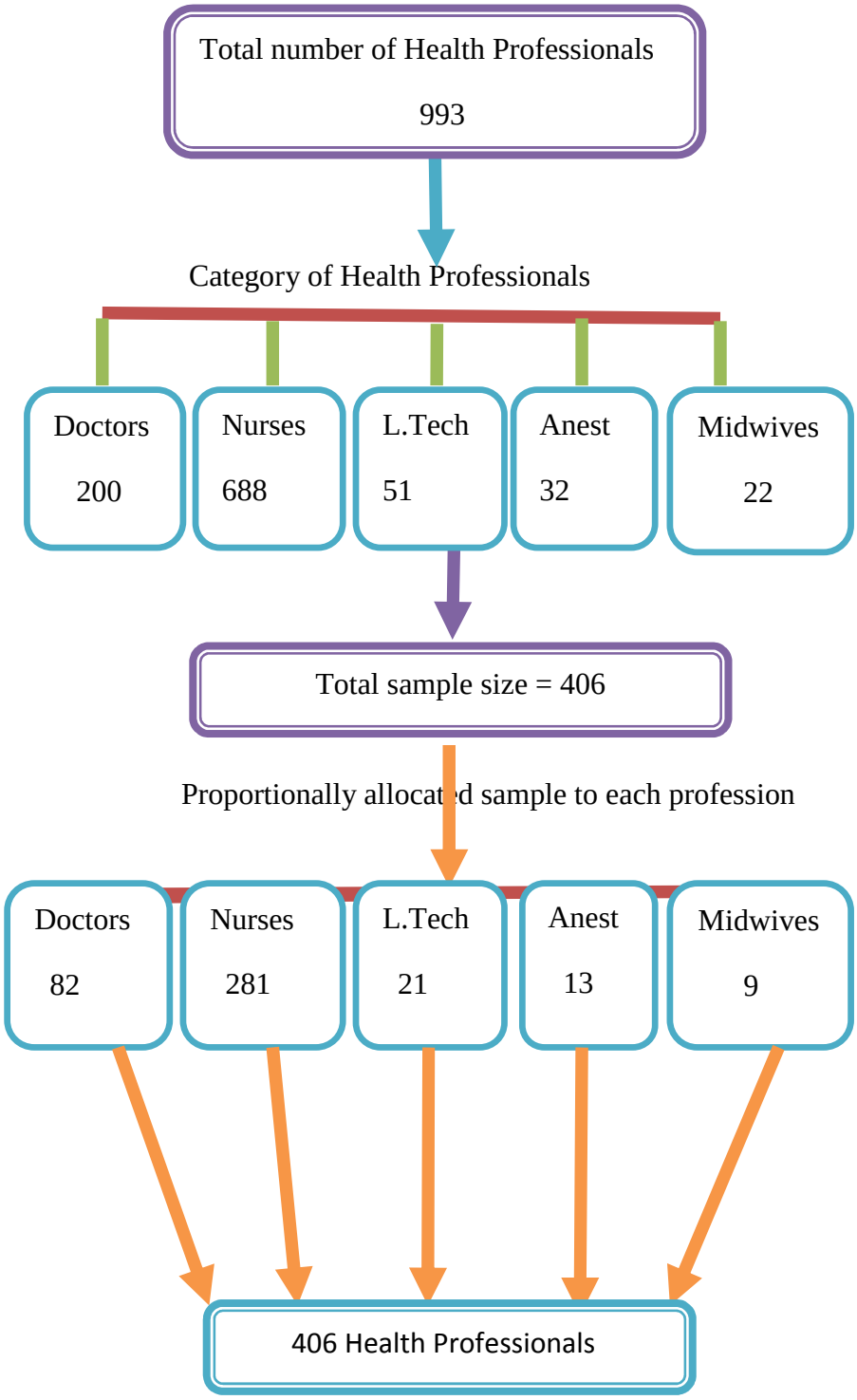


Figure 2: Schematic presentation of sampling procedure for each Category of Health Professionals

4.3.5 Sampling technique

Systematic random sampling technique was employed to select eligible study participants from list of health workers. We divided the total number of health professionals by total sample size to get the interval (k) =993/406=2.44≈2. So, the questionnaires were given for every other professional available during the data collection period based on the list from each unit.

4.4 Data collection Methods

4.4.1 Variables

4.4.1.1 Dependent variable

- The utilization of hepatitis B vaccination

4.4.1.2 Independent variables

- Socio-demographic variables
    - ✓ Age
    - ✓ Sex
    - ✓ Educational Status
    - ✓ Religion
    - ✓ Marital Status
    - ✓ Monthly Income
    - ✓ Job category
    - ✓ Service year
    - ✓ Current unit of work
- Behavioral factors
    - ✓ Fear of needles
    - ✓ Fear of the side effect of the vaccine
    - ✓ Negligence/forgetfulness
    - ✓ Not feeling at risk
    - ✓ Work load
- Health service factors and information
    - ✓ Availability of vaccine through government channels
    - ✓ Cost

4.4.2 Data collection tools

The data was collected from study subjects by using pre-tested, structured, self-administered questionnaire adopted from previous researches on the same topic with proper author permission asked by their email address. It was designed in such a way that it includes all the relevant variables to meet the study objectives which consist of 28 questions divided into three sections that cover questions to assess socio demographic characteristics, exposure, HBV screening and hepatitis B vaccine utilization of respondents including questions about factors for non-utilization. The questionnaire was developed in English language.

4.4.3 Data collection procedure

The data was collected by four BSC holder health professionals working in hospitals other than TASH and one day intensive training on the objective of the study, contents of the questionnaire and how to maintain privacy and confidentiality was provided to the data collectors. Respondents were approached at their respective work unit. The self administered questionnaire was then collected at the same time after the respondent completed it.

4.4.4 Data quality management

There are points at which the quality of data may be affected unless measures are taken at these points. These points are questionnaire designing, data collection and data entry. As this is one of the points to control the quality of data, due emphasis was given to questionnaire designing. Objective based, logically sequenced, free of scientific terms and non-leading structured questionnaire was prepared. Pre-test was undertaken on the questionnaire before the actual data collection starts and amendment was made on the parts where it was necessary.

Data collection and supervision is another area of focus to keep the quality of the data. The data collectors were provided with intensive training on the objective of the study, contents of the questionnaires and how to maintain confidentiality and privacy of the study subjects. The collected data was checked by investigator on daily basis for any incompleteness and/or inconsistency.

4.5 Data processing and analysis

4.5.1 Data processing

The Data entry and cleaning was undertaken using Epi-data version 3.1 and SPSS 20 for windows was used for analysis. Data was checked for completeness and any incomplete

questionnaire was excluded from the entry. When the entry of every questionnaire was completed, the soft copy of every questionnaire was cross checked with its hardcopy to see for the consistency. After the entry of the whole questionnaire was completed, cleaning was made to avoid missing values, outliers and other inconsistencies before analysis by using commands like frequency, sort, find and list on the same software.

4.5.2 Data Analysis

The first step before analysis was data exploration to visualize the general feature of the data to be analyzed. Descriptive statistics like frequency, mean, median and standard deviation was employed to describe the study participants by socio-demographic, behavioral and health service factors. The strength of association was computed using odds ratio. Furthermore, bivariate and multivariate binary logistic regression analyses were used to identify the significant associations. Statistical significance was declared at p- value< 0.05. Variables found significant in bivariate analysis was included in to multivariate logistic regression analysis.

4.6 Operational definitions

Exposed- the HCW who had needle stick injury, blood or fluid contact to Hepatitis B patients during medical practice

Screened- the HCW who has been tested for HBV at least once in his life time

Incomplete vaccination status- the HCW who took one or two doses of hepatitis B vaccine or who is waiting for the schedule between doses

Completely vaccinated –the HCW who took all the three doses of hepatitis B vaccine with the appropriate schedule

Not Vaccinated- the HCW who has never been vaccinated for HBV

4.7 Ethical considerations

Ethical clearance was obtained from institutional review board (IRB) of Addis Ababa University, college of health science, school of public health. After ethical clearance received, permission to conduct the research was asked from administrative body of Tikur Anbessa specialized hospital. Information sheet was prepared and given to all eligible participants of the study to obtain informed verbal consent. All participants were informed about the aim and purpose of the study and their participation was voluntarily. Name of the participant were not asked; instead code number was used to ensure confidentiality throughout the study period.

4.8 Dissemination of results

The result of this study will be presented to the School of Public Health, College of Health science, Addis Ababa University in partial fulfillment of a master's degree in public health. Furthermore, the result document will be disseminated and utilized by all responsible bodies in the study area.

5. Results

5.1 Socio demographic characteristics of the study population

A total of 394 respondents with response rate of 97% participated in the study. Two hundred seventy four (69.5%) were nurses. The median age of respondents was 27years with the minimum and maximum age of 21 and 59 years respectively. From the respondents, 217(55.1%) were females. Regarding educational status, 298 (75.6%) were found to be first degree holders. Two hundred sixty three (66.8%) of the respondents were Orthodox Christians and 8(2%) were among other categories including atheist, pagan and apostolic. Two hundred fifty three (64.2%) of the study subjects were single. The median monthly income for the respondents was 4700 Eth birr with a range of 2245 to 14000. Among the respondents, 168 (42.6%) had more than 5 years of experience and the median year of service was 5 years with a minimum and a maximum of 1 and 32 years (Table 1).

Table 1: Socio-demographic characteristics of HCWs, TASH, Addis Ababa, Ethiopia, 2016

Characteristics	Frequency	Percentage
Age		
≤24	76	19.3
25-29	201	51.0
30-34	50	12.7
35-39	42	10.7
≥40	25	6.3
Sex		
Male	177	44.9
Female	217	55.1
Educational Status		
Diploma	9	2.3
First degree	294	74.6
Masters	34	8.6
Specialization	57	14.6
Religion		
Orthodox	263	66.8

Muslim	47	11.9
Catholic	6	1.5
Protestant	70	17.8
Other	8	2.0
Marital Status		
Single	253	64.2
Married	141	35.8
Income		
<2500	9	2.3
2500-3500	124	31.5
3501-4500	60	15.2
≥4500	201	51
Job Category		
Doctor	77	19.5
Nurse	274	69.5
Laboratory Technologist	21	5.3
Anesthetist	13	3.3
Midwife	9	2.3
Service Year		
<1 year	80	20.3
1-5 years	146	37.1
>5 years	168	42.6
Unit of Work		
Emergency	32	8.1
OPD	38	9.6
Adult Ward	74	18.8
Pediatrics Ward	53	13.5
OR	129	32.7
ICU	47	11.9
Laboratory	21	5.3

5.2 Hepatitis B exposure of study participants

One hundred and seventy one (43.4%) of the study participants said they usually identify patients with hepatitis B of which 134(78.4%) said by reviewing their medical charts. Whereas,

223(56.6%) responded they do not usually identify patients with hepatitis B. From these 161(72.2% said because there is no mechanism and 16(7.2%)] said because of other reasons including I do not always have the chance to work around them 5(31.25%) and it is not a routine procedure 11(68.75%) respectively (Table 2).

Table 2: Practice of usually identifying patients with HBV among HCWs at TASH, Addis Ababa, Ethiopia, 2016

Variables	Frequency	Percent
Identify patients with HBV		
Yes	171	43.4
No	223	56.6
Identifying HBV (n=171)		
Asking Patients	26	15.2
Reviewing medical records of patients	134	78.4
Sending patients for laboratory diagnosis	67	39.2
Reasons for not identifying HBV (n=223)		
Negligence	51	22.9
Being busy	34	15.2
No mechanism of identifying	161	72.2
Others	16	7.2

Note: due to multiple responses for identification methods and reasons for not identifying is possible, sum of percentages >100

Concerning use of infection prevention precautions when caring for hepatitis B patients, 361 (91.6%) of study participants responded yes. Among them 342 (94.7%) said they dispose sharp materials properly and others 3 (0.8%) mentioned they are already vaccinated. Among those who responded no to use of infection prevention precautions 19 (57.6%) said they do not have access to protective devices (Table3).

Table 3: Use of infection prevention precautions among HCWs, TASH, Addis Ababa, Ethiopia, 2016

Variables	Frequency	Percent
Infection Prevention Precautions		
Yes	361	91.6
No	33	8.4
Precaution methods		
Wearing of double gloves	321	88.9
Wearing of goggles	154	42.7
Proper disposal of sharp materials	342	94.7
Avoid Patients diagnosed with HBV	22	6.1
Use antiseptics after contact	290	80.3
Hand washing after each contact	232	64.3
Other methods	3	0.8
Reasons for no precaution		
Don't think I am at risk	2	6.1
Negligence	14	42.4
Don't have access to protective devices	19	57.6

Note: Due to multiple response for mechanisms of precautions and reasons for not using them is possible, sum of percentages >100

When asked about whether they deliver the same standard of care for Hepatitis B patients 324 (82.2%) responded yes and 70 (17.8%) responded no, of them 38 (54.3%) said because of fear of exposure and 9 (12.9%) mentioned other reasons including 1 (0.3%) don't have a reason, 2 (0.5%) don't know and 6 (1.5%) negligence (Table 4).

Table 4: Standard of care delivery status among HEWs, TASH, Addis Ababa, Ethiopia, 2016

Standard of care	Frequency	Percent
Deliver the same standard of care		
Yes	324	82.2
No	70	17.8
Reasons for not delivering		

Patients need special care	25	35.7
Fear of exposure	38	54.3
Other reasons	9	12.9

Note: Due to multiple responses for reasons for not delivering same standard of care is possible, sum of percentages >100

Concerning the HCWs who had exposure from Hepatitis B patient, 51 (12.9%) responded yes. From those who had exposure 43 (84.3%) said they got the exposure between 1 to 5 years ago. They were asked the measures they took after the exposure, and 37 (72.5%) said rinsed it with water and 5 (9.8%) said other measure meaning they already got vaccinated (Table 5).

Table 5: HBV Exposure status of HCWs, TASH, Addis Ababa, Ethiopia, 2016

Exposure to HBV	Frequency	Percent
Ever encountered exposure specifically from HBV patient		
Yes	51	12.9
No	343	87.1
If yes, when		
<1 year	8	15.7
1-5 years	43	84.3
Measures you take after exposure concerning HBV		
Rinsed it with water	37	72.5
Took post exposure prophylaxis	7	13.7
Diagnosed for Hepatitis B	18	35.3
Prayed	10	19.6
Did nothing	8	15.7
Other	5	9.8

Note: Due to multiple responses for measures taken after exposure is possible, sum of percentage >100

5.3 Hepatitis B Screening and Vaccine utilization status of study participants

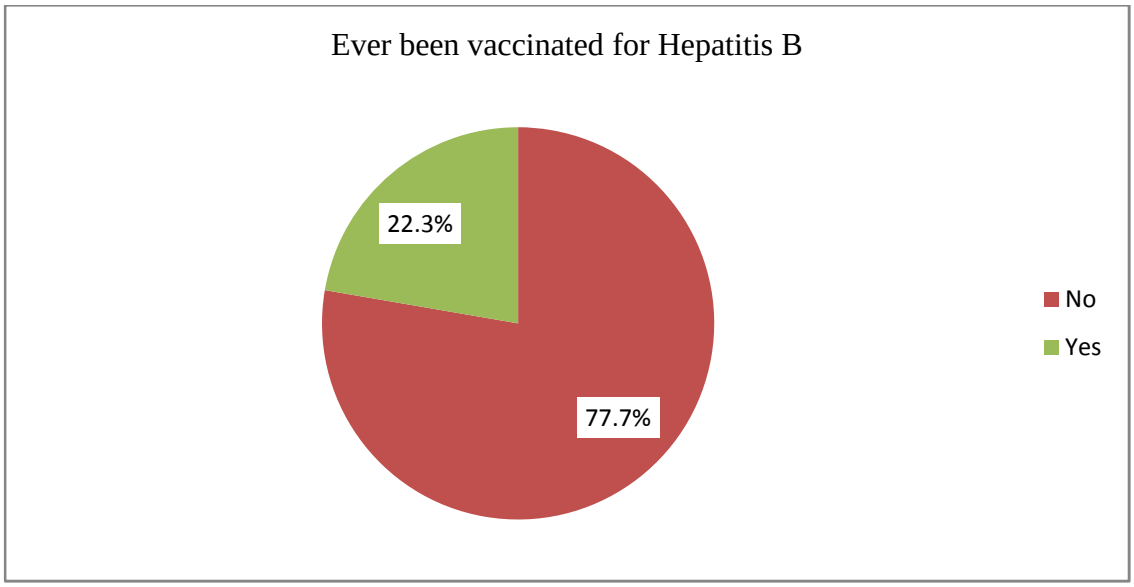
From the respondents, 230 (58.4%) were tested for HBV. One hundred ninety three (84%) of those who got tested did so before 1-5 years ago. For those who are not tested the major reason mentioned was unavailability of the diagnosis 88 (53.7%),

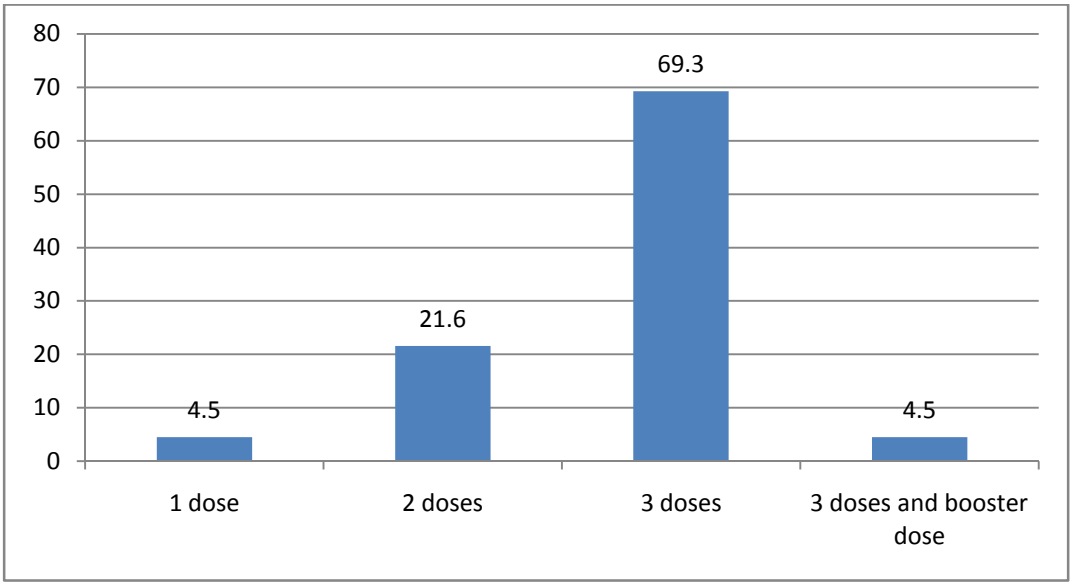
Table 6: Time of screening and reasons for not getting tested among HCWs, TASH, Addis Ababa, Ethiopia, 2016

Screening	Frequency	Percent
Ever Screened		
Yes	230	58.4
No	164	41.6
When screened		
<1 year	24	10.4
1-5 years	193	84
>5 years	13	5.6
If no, why		
Unavailability of the diagnosis	88	55.7
Cost	16	9.8
Negligence	83	50.6
Fear of positive results	10	6.1
Workload	21	12.8

Note: Due to multiple response for reason for not getting tested is possible, sum of percentages >100

Regarding hepatitis B vaccine utilization, only 88 (22.3%) responded they have ever received hepatitis B vaccine where as 306 (77.7%) responded they have never received Hepatitis B vaccine.


Ever been vaccinated for Hepatitis B
22.3%
77.7%
No
Yes


80
70
60
50
40
30
20
10
0
4.5
21.6
69.3
4.5
1 dose
2 doses
3 doses
3 doses and booster dose

(21.7%) said other reasons including because of pregnancy 3 (60%) and I am waiting for the third dose 2 (40%) respectively (Table 7)

From the reasons mentioned for not yet vaccinated 173 (56.5%) responded unavailability of the vaccine through government channels and others 6 (2%) including fear of positive results 1 (16.67%), late for vaccination 1(16.67%) and not yet tested 4(66.67%) respectively. (Table 7)

Table 7: Hepatitis B vaccination status of HCWs, TASH, Addis Ababa, Ethiopia, 2016

Vaccination Status	Frequency	Percent
Completed vaccination with appropriate schedule (n=88)		
Yes	65	73.9
No	23	26.1
Reasons for not completed (n=23)		
Forgot the schedule	8	34.8
Costly	4	17.4
Unavailability of the vaccine	2	8.7
Missed doses	4	17.4
Others	5	21.7
Reasons for not vaccinated (n=306)		
Unavailability of the vaccine through government channels	173	56.5
Cost	53	17.3
Fear of needles	3	1
Fear of side effects of the vaccine	29	9.5
Negligence	125	40.8
Workload	28	9.2
Others	6	2

Note: Due to multiple response for reasons for not completing vaccination schedule and not yet vaccinated is possible, sum of percentages >100

5.4 Association between socio-demographic characteristics and hepatitis B vaccine utilization

In the bivariate analysis, sex, religion, monthly income, service year and current work unit of the respondents were not found to be associated with hepatitis B vaccine utilization. Whereas, age, educational status, marital status and job category was significantly associated with hepatitis B vaccination status of the respondents.

Study participants whose age group between 30-34 [COR: 5.92, 95% CI, (1.2-28.2)] and 35-39 [COR: 8.63, 95%CI, (1.8-41.4)] were about 6 times and 8.6 times more likely to receive hepatitis B vaccine as compared to those aged 40 years and more. Those who are degree holders [COR: 0.33, 95%CI, (0.18-0.60)] and masters holders [COR: 0.29.95%CI, (0.11-0.82)] were found to be 0.33 times and 0.29 times less likely to receive hepatitis B vaccine as compared to specialization holders. Those respondents who were single [COR: 0.4, 95%CI, (0.3-0.7)] were 0.4 times less likely to receive hepatitis B vaccine as compared to respondents who are married. From the study participants, doctors [COR: 2.7, 95%CI, (1.5-4.7)] were 2.7 times more likely to receive hepatitis B vaccine than nurses.

In the multivariate analysis, all variables which had significant association in the binary regression showed significant association except for study participants who are degree holders and job category of study participants. Study participants whose age is in the category of 30-34 and 35-39 were 21 times [AOR: 21.1, 95%CI, (3.6-125.5)] and 18.6 times [AOR: 18.6, (3.14-109.9)] more likely received hepatitis B vaccine than those greater than or equal to 40 years. Those respondents with educational level of masters were 0.15 times less likely to receive hepatitis B vaccine as compared to those with specialization. [AOR: 0.15, 95%CI, (0.04-0.5)]. Respondents with marital status of single were 0.24 times less likely to receive hepatitis B vaccine than those who are married [AOR: 0.24, 95%CI, (0.16-0.49)].

Table 8: Association between socio-demographic characteristics and hepatitis B vaccine utilization of HCWs, TASH, Addis Ababa, Ethiopia, 2016

Socio-demographic Characteristics	**Vaccination status**		**COR 95% CI**	**AOR 95% CI**
	Yes (%)	No (%)		
Age				
≤24	12 (15.8)	64 (84.2)	2.2 (0.4-10.4)	7.71(0.14-52.13)
25-29	39 (19.4)	162 (80.6)	2.77 (0.63-12.24)	9.64 (0.71-53.64)
30-34	17 (34.0)	33 (66)	5.92(1.2-28.2)*	21.1 (3.6-125.5)*
35-39	18 (42.9)	24 (57.1)	8.63 (1.8-41.4)*	18.6(3.14-109.9)*
≥40	2 (8)	23 (92.0)	1.00	1.00

Educational Status				
Diploma	0(0.0)	11 (100)	0.17 (0.02-1.5)	0.12(0.01-1.3)
Degree	58(19.5)	240(80.5)	0.33(0.18-0.60)*	0.32 (0.06-1.51)
Masters	6 (17.6)	28 (82.4)	0.29 (0.11-0.82)*	0.15 (0.04-0.5)*
Specialization	24 (42.1)	33 (57.9)	1.00	1.00
Marital Status				
Single	42 (16.6)	211 (83.4)	0.41 (0.3-0.7)*	0.24 (0.16-0.49)*
Married	46 (32.6)	95 (67.4)	1.00	1.00
Job category				
Doctor	28 (36.4)	49 (63.6)	2.7 (1.5-4.7)*	
Nurse	48 (17.5)	226 (82.5)	1.00	---
Lab. Technologist	5 (23.8)	16 (76.2)	1.5 (0.5-4.2)	
Anesthetist	3 (23.1)	10 (76.9)	1.4 (0.4-5.3)	
Midwife	4 (44.4)	5 (55.6)	3.8 (0.9-14.5)	

*Significant association COR-crude odds ratio AOR-Adjusted Odds ratio

5.5 Association between respondents' exposure status and hepatitis B vaccine utilization

From the data gathered concerning exposure status of respondents, infection prevention precautions, same standard of care delivery and respondents' exposure status, only identification of patients with hepatitis B, reasons for not identifying, precautions they take and their exposure status showed significant association with hepatitis B vaccine utilization in the binary logistic regression.

Although do not identify patients with hepatitis B because of negligence and those who use goggles as precaution mechanism showed significant association in bivariate analyses, but no association in the multivariate analysis. Those who identify patients with hepatitis B were 0.5 times less likely to receive hepatitis B vaccine than those who do not [AOR: 0.5, 95%CI, (0.25-0.88)]. Among infection prevention precaution users, those who wash their hands after each contact were 0.2 times more than received hepatitis B vaccine than those who do not [AOR:0.2, 95%CI, (0.09-0.42)]. Respondents who had exposure with hepatitis B patient were 0.2 times less received hepatitis B vaccine than those who do not [AOR: 0.2, 95%CI, (0.09-0.47)].(Table 9)

Table 9: Association between HCWs exposure status and hepatitis B vaccine utilization, TASH, Addis Ababa, Ethiopia, 2016

Variables	Vaccination status		COR	AOR
	Yes (%)	No (%)	95%CI	95%CI
Identify patients with Hepatitis B				
Yes	50 (29.2)	121 (70.8)	0.5 (0.31-0.8)*	0.5 (0.25-0.88)*
No	38 (17.0)	185 (83.0)	1.00	1.00
If not identify, why				
Because of negligence				
Yes	15 (29.4)	36 (70.6)	0.4 (0.2-0.8)*	0.51 (0.15-1.77)
No	23 (13.4)	149(86.6)	1.00	1.00
What precautions				
Wearing goggles				
Yes	46 (29.9)	108 (70.1)	0.5 (0.3-0.8)*	0.41 (0.14-1.16)
No	35 (16.9)	172 (83.1)	1.00	1.00
Hand washing				
Yes	65 (28)	167 (72)	0.4 (0.2-0.7)*	0.2 (0.09-0.42)*
No	16 (12.4)	113 (87.6)	1.00	1.00
Encountered exposure				
Yes	21 (41.2)	30 (58.8)	0.35 (0.2-0.6)*	0.21 (0.09-0.47)*
No	67 (19.5)	276 (80.5)	1.00	1.00

*Significant association

No association was found between those who give the same standard of care for HBV patients, those who have been tested for hepatitis B and reasons mentioned for not getting vaccinated for hepatitis B vaccine with hepatitis B vaccine utilization status of HCWs.

6. Discussion

In this study, hepatitis B vaccine utilization status of health care professionals was examined. According to the result, low percentage 88 (22.3%) of respondents had ever received hepatitis B vaccine which is comparable with a study done in Nigeria where 61 (26.8%) had been vaccinated (27). It is also in line with WHOs estimation that HBV vaccination coverage amongst HCWs is only 18-39% in low and middle-income countries (35). But, our finding was higher than that of a study done in Bahir dar, Ethiopia where only 37 (10%) of respondents reported that they received one or more doses of hepatitis B vaccine (15). This could be due to the 3 years time difference between the two studies and the efforts made to get health care professionals informed and tested for hepatitis B started in recent years. Also the high figures in this study may be reflective of the fact that the study was carried out in a tertiary hospital where a lot of research and training take place and therefore the level of awareness about HBV and the vaccination is relatively high.

In the multivariate analysis it was found that respondents at the age group of 30-34 and 35-39 were more likely to receive hepatitis B vaccine than those with age ≥ 40. This might be due to the fact that age at vaccination is an important factor in the immunogenicity of the hepatitis B vaccine and higher age at vaccination in adults has been identified as a factor in hepatitis B vaccine non response (1).

After the multivariate analysis, those with educational status of masters were found to be less likely to receive hepatitis B vaccine than those with specialization. Also, singles were found to be less likely to receive hepatitis B vaccine than those who were married. This might be due to the difference in the personal characteristics of the respondents, may be the younger the subject, the more negligence.

Results from the multivariate analysis showed that respondents who usually identify patients with hepatitis B were less likely to take hepatitis B vaccine than those who do not. The possible reason could be those who usually identify patients with hepatitis B might consider they use appropriate infection prevention techniques and there is no need of taking the vaccine whereas those who do not usually identify patients with hepatitis B might think they need to take the vaccine as a protective means because they do not know whether the patients they care for has hepatitis B or not.

Ninety one point six percent of respondents in this study reported that they use infection prevention precautions when they care for patients with hepatitis B. This seems a little higher than a study done in Turkey among nurses in which 75.8% of them said they use infection prevention precautions (46). This is an important step for future prevention and control of HBV.

The results of this study indicated that 88.9% of respondents said they use double gloves, 94.7% proper disposal of sharp materials and 64.3% said they wash their hands after each contact when they care for hepatitis B patients. This result has some similarity with a study done in Ibahan, Nigeria where 93.8% wear gloves during procedures, 54.7% place needles in sharp containers and 95.7 % use hand washing as preventive measures (42). In the multivariate analysis, those respondents who said they wash their hands as infection prevention precaution after each contact with hepatitis B patient were less likely to receive hepatitis B vaccine than those who do not.

In this study 51 (12.9%) of study participants responded they had exposure specifically from hepatitis B patients. This result is very low when compared to a study done in Bahir dar in which 335 (89.6%) reported history of occupational exposure (15). This might be due to the difference in way of asking the question among the two studies. The study done at Bahir dar asked their general exposure for blood or body fluids whereas in this study their exposure specifically to patients with HBV. However, results from the multivariate analysis revealed that those who had exposure from hepatitis B patient were less likely to receive hepatitis B vaccine than those who had no exposure. The possible reason could be, those who had the exposure might think they become serologically positive for the virus in which case they can no more take the vaccine.

The findings of this study indicated that 230 (58.4%) of the respondents were tested for HBV which is higher than the research findings of a study conducted in Ibahan, Nigeria where 34.8% of respondents screened for hepatitis B (42). However, history of testing was not found to be associated with utilization of hepatitis B vaccine.

In our study, among those who took hepatitis B vaccine, 4 (4.5%) took one dose, 19 (21.6%) took two doses, 61 (69.3%) took three doses while 4 (4.5%) took three doses and booster dose. This can be in accordance with a study done in Gauteng province North Africa in which only 61.2% of those vaccinated had received all three doses of the vaccine (38) and with another study done in Kuwait where 15 (3.8%) took one dose, 41 (10.3%) took two doses, 335 (84%)

took three doses (37). But, the result is slightly higher than a study done in Bahir dar where only 20 (54%) received three or more doses (15). This difference might be due to the fact that the total study participants who ever received hepatitis B vaccine were lower in the study done at Bahir dar than this study.

Seventy three point nine percent of the study participants who received hepatitis B vaccine completed the vaccination with appropriate schedule. This result has similarity with a study done in Benin City, Nigeria where 71.6% had completed vaccination (43). But, it is slightly higher than a study conducted in south Nigeria where 59.4% had completed the vaccination schedule (41). This might be due to the time difference in which the two studies were conducted.

In this study, 26.1% of study participants responded they did not complete vaccination with appropriate schedule and they mentioned the reasons forgot the schedule (34.8%), it is costly (17.4%), missed doses (17.4%) and unavailability of the vaccine (8.7%) which has some similarity with a study done in North India in which about 20% of the participants could not complete the vaccination immunization schedule. The most common (45%) reason cited for not taking the recommended number of dosage was lack of knowledge about the total number of doses to be taken for full protection and the other reasons include did not get time (28%), while 22% forgot that they were to receive other doses too. About 36% of them were not interested in spending any money on vaccination, so they cited the reason for incomplete vaccination as unavailability of the vaccine through government channel (36).

Reasons mentioned for not getting vaccinated by respondents in our study were unavailability of the vaccine through government channels 56.5%, negligence 40.8%, cost 17.3%, fear of side effects of the vaccine 9.5%, workload 9.2% and fear of needles 1%. This is somewhat similar with the studies done in different places including in Bahir dar where 60.36% and 39.93% reported that the vaccine was not available and costly respectively (15), in North India where 41.6% mentioned negligence, 28% fear of side effects, did not get time 28%,20% unavailability of the vaccine with government channel (36) and another study done in south Nigeria in which among those who did not receive HBV vaccine, 44.4 % had no any reason and 22.2% mentioned they are busy as a reason for not to be vaccinated (41).

7. Strength and Limitations of the study

7.1 Strength of the study

- The study can be used as baseline information for other researchers.
- High response rate
- Selection of the study subjects was done using systematic random sampling to avoid selection bias.

7.2 Limitation of the study

- This study is cross sectional, where causal relationship between the independent and dependent variables cannot be established.
- The study was limited to Tikur Anbessa specialized hospital in Addis Ababa, where the research results are limited to that particular hospital and may not be generalized to all HCWs particularly those in other health settings within the country.
- The findings in this study may be prone to recall bias as they are based on participants' reported experiences

8. Conclusion and Recommendation

8.1 Conclusion

In this study only 22.3% of HCWs reported that they have ever received hepatitis B vaccine. From the total respondents, only 15.5% received three complete doses of hepatitis B vaccine. This is a serious public health scenario and challenge for a country like Ethiopia with high prevalence of hepatitis B infection.

Of the infection prevention precautions mentioned, 6.1% of study participants said they avoid patients who are diagnosed with HBV. This shows there is still knowledge gap about infection prevention precaution methods concerning Hepatitis B even among health care professional.

From those who had exposure to hepatitis B patients, only 41.2% had received hepatitis B vaccine which is a very low. Also only 58.4% of respondents were diagnosed with hepatitis B.

The most frequent reason mentioned for not getting vaccinated was unavailability of the vaccine through government channels (56.5%). The result can be a wakeup call for the government to work on a means to get all health care professionals vaccinated against hepatitis B.

8.2 Recommendation

Based on the results of the study the following recommendations are made.

For Ministry Of Health

- Hepatitis B prevention and control implementation guideline and hepatitis B data has to be derived, and from this guideline each concerned bodies including hospitals and universities could work out their own strategy on hepatitis B.
- Hepatitis B training package should also be prepared to mainstream Hepatitis B related issues to health care professionals including students, instructors, staffs and other concerning stakeholders.
- The government should play its part by increasing health care budgets and put priority on hepatitis B prevention by establishing a national awareness campaign, spreading screening and vaccination services all over public hospitals.
- The hospital together with ministry of health and other non-governmental donating agencies should work on a means to make the vaccine available for the health care professionals not only for themselves but also for the safety of the community they serve.

For Researchers

- Further study is needed to investigate which specific reason is responsible for low hepatitis B vaccine utilization of health care professionals

For Health Care Workers

- Health care workers practicing at any level should be aware of the seriousness of the situation, get tested and receive the full doses of the vaccine accordingly for the sake of the community and themselves.

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10. Annex

Annex I: English version Information sheet

Dear Respondent; my name is Tigist Belete. Currently I am a graduate student at Addis Ababa University, college of Health Sciences, School of public Health. I am conducting a research to assess Hepatitis B vaccination status among health care professionals at Tikur Anbessa Specialized Hospital.

Purpose

The main purpose of the study is to collect information necessary to describe the level of Hepatitis B vaccine utilization among health care professionals and in order to identify the gap to recommend possible solutions. To attain this purpose your honest and genuine participation is very important and highly appreciable. I, therefore, kindly request you to fill this questionnaire as accurately and carefully as possible.

Risk

By participating in this research, you may feel that it has some discomfort especially on wasting time about 5-10 minutes to fill out the questionnaires. We hope that you will choose to participate in this study for the sake of the benefit. There is no risk of any sort that will be incurred by participating in this study.

Benefit

Participants in this study will receive no direct benefit from the study since participation is voluntary and there are no incentives. However the outcomes of the study will be indirectly beneficial in improving the service provision and utilization.

Confidentiality

Please be assured that all the information gathered will be kept strictly confidential and your name does not need to be written in any page of the questionnaire. Only the researcher has access of the information and uses it for the study purpose only. You have a full right not to participate in this study. You can choose not to respond to some or all questions if you do not want to give your response. You have also the full right to withdraw from this study at any time you wish if you find it uncomfortable.

Whom to contact

If you need more information and if you have question here is the contact address of the investigator.

Tigist Belete, Tel: 0913199473,e-mail:tg_belete@yahoo.com

Annex II. Consent form

I am informed on the study to be conducted by Masters Student in Addis Ababa University, College of health sciences, School of public health on the assessment of hepatitis B vaccine utilization among health care professionals at Tikur Anbessa specialized hospital. My participation in this study is voluntary, no obligation to answer any questionnaire. I am informed that there is no harm by not answering the questions and no special benefit by answering the questions and also filling out the questionnaires will take only 5-10 minutes .I heard all the information mentioned above and willing to participate in the study.

Yes □

No □

If yes, put a tick mark in the box and continue to the next page

Annex III: English Questionnaires

Addis Ababa University

College of Health Sciences

School of Public Health

A Self-administered structured questionnaire to assess Hepatitis B vaccine utilization among health care professionals at Tikur Anbessa Specialized Hospital, Addis Ababa.

English Questionnaires

Questionnaire code _____

Instruction: Circle the responses for questions with alternatives and write for open ended questions on the space provided

Part I: Respondents Socio-demographic characteristics

0101. Age in completed years **……** years

0102 Sex

1. M
2. F

0103. Educational status

1. Diploma
2. Degree
3. Masters
4. PhD
5. Specialization
6. Other (specify)**.....**

0104. Religion

1. Orthodox
2. Muslim

3. Catholic
4. Protestant

   Other (specify)**.....**

0105. Current marital status

1. Single
2. Married
3. Widowed
4. Divorced
5. Separated

0106. How much is your total monthly income? **…….**birr

0107. Job Category

1. Doctor
2. Nurse
3. Laboratory Technician
4. Anaesthetist
5. Midwife

0108. How many years of service do you have since your first graduation? **.....**

0109. In which unit are you currently working? **.....**

Part II: Questions regarding exposure of health care professionals

0110. Do you usually identify patients with Hepatitis B? (**If No, go to Q. 0113**)

1. Yes
2. No

0111. If yes, how do you identify patients with Hepatitis B? **(Multiple responses are possible)**

1. By asking them
2. By reviewing their medical record
3. By sending them for laboratory diagnosis
4. Other, (specify)**.....**

0112. If No to Q. 0111, why? **(Multiple responses are possible)**

1. Because of negligence
2. Because I am busy
3. Because there is no mechanism of identifying
4. Other, (specify)**.....**

0113. Do you use infection prevention precautions when you care for patients with **Hepatitis B**? (**If no, go to Q. 0116**)

1. Yes
2. No

0114. If yes, what precautions you use? (**Answer each of the following choices by ticking**)

1. Wearing of double gloves yes □ No □
2. Wearing of goggles yes □ No □
3. Proper disposal of sharp materials yes □ No □
4. Avoid patients diagnosed with hepatitis B yes □ No □
5. Use antiseptics after contact yes □ No □
6. Hand Washing after each contact yes □ No □
7. Other (specify) …**……**

0115. If no to Q. 0114, Why? **(Multiple responses are possible)**

1. I don't think I am at risk
2. Negligence
3. I don't have access to protective devices
4. Others(specify)----------

0116. Do you deliver the same standard of care for patients with **Hepatitis B** as you do for other patients? (**If yes, go to Q. 0119**)

1. Yes,
2. No

0117 If No to Q. 0117, why? **(Multiple responses are possible)**

1. They need special care
2. Fear of exposure
3. Other (specify)…….

0118. Have you ever encountered exposure specifically from **Hepatitis B patient**? (**If no go to Q.0122**)

1. Yes
2. No

019. If Yes, When was that? **……**

0120. What measures did you take after the exposure concerning Hepatitis B? **(Multiple responses are possible)**

1. I rinsed it with water
2. I took post exposure prophylaxis (PEP)
3. I diagnosed for Hepatitis B
4. I prayed
5. I did nothing
6. Other (specify)**….....**

Part III: Questions concerning HBV screening and Hepatitis B vaccine utilization

0121. Have you ever been tested for Hepatitis B virus? (**If no go to Q.0124**)

1. Yes
2. No

0122. If yes, when was that? **.....**

0123. If no to Q. 0122, what is your specific reason? **(Multiple responses are possible)**

1. Unavailability of the diagnosis
2. Cost
3. Negligence
4. Fear of positive results
5. Work load
6. Other (specify) **…….**

0124. Have you ever received Hepatitis B vaccine? (**If no, go to Q 0129**)

1. Yes
2. No

0125. If yes to Q. 0125 how many number of doses of vaccine you received?

1. 1dose
2. 2 doses
3. 3 completed doses
4. 3 completed doses and a booster dose
5. I do not remember

0126. Have you completed the vaccination with the appropriate vaccination schedule?

1. Yes
2. No

0127. If not completed the appropriate vaccination schedule, why? **(Multiple responses are possible)**

1. I forgot the schedule
2. Because it is costly
3. Unavailability of the vaccine
4. Missed doses
5. I did not know the correct schedule
6. Others (specify) **……**

0128. If not yet vaccinated, what are your reasons? **(Multiple responses are possible)**

1. Unavailability of the vaccine through government channels
2. Cost
3. Fear of needles
4. Fear of side effects of the vaccine
5. Negligence
6. Work load
7. Others (specify) **……**

I finished my questions. Thank you very much for your time!!!