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The prevalence, knowledge, attitude and practice of Federal police crime prevention staffs towards hepatitis B virus (HBV) and hepatitis C virus (HCV) in Addis Ababa, Ethiopia.

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Abbreviations

Anti-HBc- Anti-Hepatitis B Core Antigen

Anti- HBe- Anti-Hepatitis B envelope Antigen

Anti-HBs- Anti-Hepatitis B Surface Antigen

Anti-HCV- Anti-Hepatitis C Virus

AOR- Adjusted Odds Ratio

CDC- Center for Disease Control and Prevention

CHB- Chronic Hepatitis B virus

CIs - Confidence Intervals

CS - Cross Sectional Study Design

DAAs- Direct Acting Antiviral Drugs

DNA - Deoxy Ribonucleic Acid HAV-Hepatitis A Virus

ELISA Enzyme Linked Immunosorbent Assay

HBeAg- Hepatitis envelope Antigen

HBsAg- Hepatitis B surface Antigen

HBV- Hepatitis B Virus

HCC- Hepatocellular Carcinoma

HCV- Hepatitis C Virus

HRP- Horse radish peroxidase

INF- Interferon

IRB- Institutional Review Board

IU- International Unit

KAP- knowledge, attitude and practice

Kb- Kilo Base

Ml- Milliliter

Nm- nanometer

OR- Odds Ratio

RNA- Ribonucleic Acid

Ss- Single stranded

TMB- tetra-methyl Benzedrine

WHO- World Health Organization

Abstract

Background: Viral hepatitis could be an international public health problem affecting many individuals each year, causing disability and death. Hepatitis B and Hepatitis C viruses are common causes of hepatitis. Federal police crime prevention staffs are high-risk people for parenteral and sexually transmitted diseases such as hepatitis B virus (HBV) and hepatitis C virus (HCV). Data regarding prevalence, knowledge, attitude and practice of Federal police crime prevention staffs towards hepatitis B virus (HBV) and hepatitis C virus (HCV) in Ethiopia is limited.

Objective: Determining the prevalence, knowledge, attitude and practice of Federal police crime prevention staffs towards hepatitis B virus (HBV) and hepatitis C virus (HCV) in Addis Ababa, Ethiopia.

Methods: Institutional based cross sectional study was conducted among 500 federal police crime prevention staffs, in Addis Ababa, Ethiopia from December 2018 to June 2019. A systematic probability sampling method was employed. A structured questionnaire was used to collect data on socio-demographic characteristics, knowledge, attitude and practice. All samples were tested, using a wondfo one step test strip for HBsAg and Ecotest test strip for HCV. Positive samples were retested by using Murex HBsAg version 3 UK ELISA kits. Data entry and analysis was done using SPSS version 20 computer software.

Results: The overall prevalence of HBV among Federal police crime prevention staffs in Addis Ababa, Ethiopia was 4.6% (n=23/500). Of those 4.9% (n=20/407) males and 3.2% (n=3/93) of females were positive for HBV. The overall prevalence of HCV was 0(0%). From the total participants, 51% (n=255/500) did not heard about hepatitis, 61.4% (n=332/500) and 61% (n=305/500) incorrectly identified that HBV and HCV can be transmitted by feco-oral and contaminated water, 97% (n=485/500) were not screened and 99.6% (n=498/500) were not vaccinated. The majority of the study participants 349(69.8%) believe that their job puts them at high risk of acquiring of HBV and HCV, 84.6% (n=423/5) agreed that taking of HBV vaccine is safe.

Conclusion and recommendation: The prevalence of hepatitis B viruses among federal police crime prevention staffs in Addis Ababa was intermediate and very low hepatitis C. Majority of the participants had limited knowledge about the transmission and protection of HBV and HCV infection. Large scale study is important to make generalization and conducting regular health education is essential.

Key words: Hepatitis B and C virus, prevalence, federal police crime prevention, KAP

1. Introduction:

1.1 Background: Viral hepatitis could be an international public health problem affecting many individuals each year, causing disability and death. Hepatitis B and hepatitis C viruses are common causes of hepatitis. Universally, hepatitis B virus (HBV) and hepatitis C virus (HCV) infection are major causes of acute and chronic liver disease (e.g. cirrhosis and hepatocellular carcinoma (HCC)), resulting in an evaluated 1.4 million deaths every year*[1]*. It is evaluated that 2 billion individuals are living with HBV and from them 248 million are chronic HBV infection (CHB) *[2]*, and that 110 million persons are HCV-antibody positive and 80 million have chronic viraemic HCV disease [*3]*. Around the world, it is estimated that a similar proportion of the whole liver cancer mortality can be credited to HCV (34,500) and HBV (30,000), with a smaller fraction due to alcohol *[1]*. The burden of HBV and HCV remains excessively high in low and middle-income countries. Around 60% of the world's population lives in regions where HBV infection is highly endemic, especially Asia and Africa. Additionally, even in low-prevalence zones, certain sub populations have high levels of HCV and HBV disease, such as men who have sex with men, people who inject drugs, people with HIV, as well as indigenous communities and transients. The World Health Organization classifies countries according to the hepatitis B surface antigen (HBsAg) into low (<2%), intermediate (2–8%), and high (>8%) prevalence and (HCV) into very low (<0.1%), low (0.2-1%), intermediate (1.1–5%), and high (>5%) prevalence. [4, 5, 6, 7].

In most cases, federal police live in police camps which may contribute to predispose them to HBV and HCV transmission through some common routes. The risk of sharing utensils such as hair-brushes, combs, razors and tooth brushes is common among people living in groups that can facilitate transmission of the viruses [8, 9]. Additionally, usually federal police travel from place to place for different professional reasons and stay longer apart from their family. This may force them to have multiple sex partners that can expose them for different sexually transmitted infections including HBV and HCV.

1.1.1 Hepatitis B infection

Natural history of HBV infection

Hepatitis B virus is an enveloped DNA virus, measuring 42–47 nm in diameter and a member of the family Hepadnaviridae hepatotropic DNA viruses. Hepatitis B viral hepatitis virus causes both acute and chronic infection that may range from symptomless infection or mild illness to severe or sudden hepatitis. Acute hepatitis B is typically a self-limiting illness marked by acute inflammation

and hepatocellular necrosis, with a case death rate of 0.5–1%. Chronic hepatitis B (CHB) encompasses a spectrum of illness, and is defined as persistent HBV infection (the presence of detectable HBsAg within the blood or serum for extended than six months), with or without associated active viral replication and evidence of hepatocellular injury and inflammation [10, 11, 12].

Epidemiology of hepatitis B infection

It is estimated that worldwide, 2 billion individuals have evidence of past or present infection with HBV, and 248 million are chronic carriers of HBV surface antigen (HBsAg). Age-specific HBsAg seroprevalence varies markedly by geographical region, with the highest prevalence in sub-Saharan Africa, East Asia, some parts of the Balkan region, the Pacific Islands and Amazon Basin of South America. Prevalence below two is seen in regions such as Central America, North America and Western Europe [2]. In Asia and most different regions, the incidence of HCC and cirrhosis is low before the age of 35–40 years on the other hand rises exponentially [1]. However, in some parts of Africa, Alaska and also the Amazon, the incidence of HCC is additionally high in infected children and young adult men [13, 14].

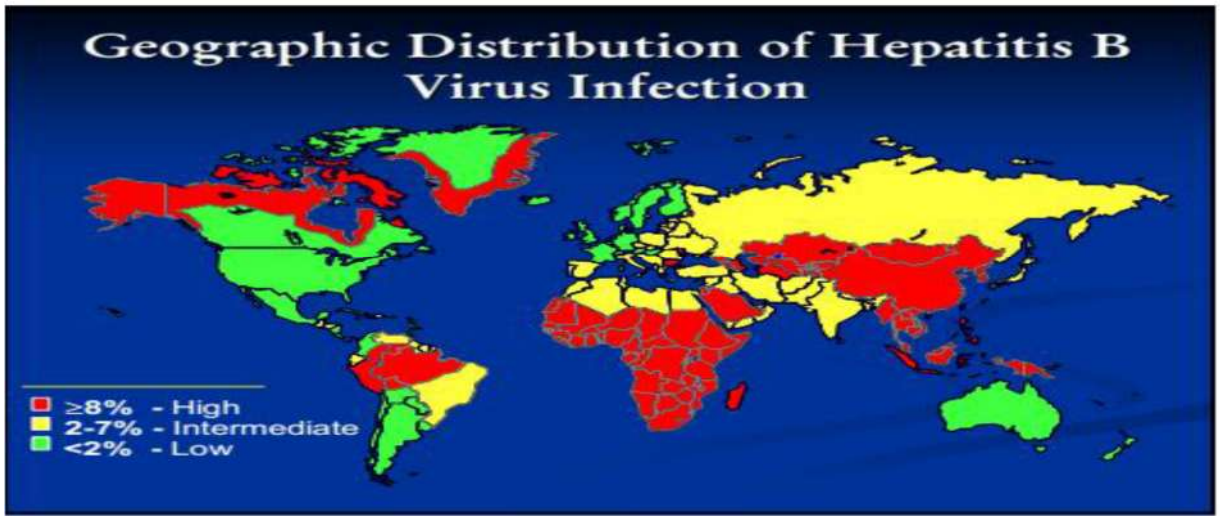

Figure 1: Geographic distribution of hepatitis B virus infection (Hollinger and Lau, 2006)

Transmission of hepatitis B infection

HBV is spread predominantly by percutaneous or mucosal exposure to infected blood and varied body fluids, including saliva and discharge, vaginal and seminal fluids. Prenatal transmission is that the major route of HBV transmission in several parts of the globe, and a very important factor in maintaining the reservoir of the infection in some regions, significantly in China and South-East

Asia. Horizontal transmission, including family, interfamilial and particularly child to child, is additionally important [15, 16].

Preventing hepatitis B infection through vaccination

Vaccination of infants and, specifically, delivery of hepatitis B vaccine within 24 hours of birth is 90–95% effective in preventing infection with HBV as well as in decreasing HBV transmission if followed by a minimum of two other doses. WHO recommends universal hepatitis B vaccination for all infants, and giving the first dose as soon as possible when birth [17].

Treatment of hepatitis B infection

WHO recommends antiviral agents (tenofovir and entecavir) that are active against HBV infection and are shown to effectively suppress HBV replication, prevent progression to cirrhosis, and reduce the risk of HCC and liver-related deaths [18, 19]. However, within the majority of patients, treatment with these medication doesn't give cure (i.e. the person continues to have replicating virus), necessitating probably lifelong treatment.

1.1.2 Hepatitis C infection

Natural history of hepatitis C infection

HCV may be a little (50nm in size); positive-stranded RNA-enveloped virus with multiple genotypes and sub genotypes, and their distribution varies considerably in several parts of the planet. Hepatitis C virus causes both acute and chronic infection. Acute HCV infection is outlined because the presence of certain markers of HCV infection within six months of exposure to and infection with HCV, and is characterized by the appearance of HCV RNA, HCV core antigen (p22 Ag), and after HCV antibodies, which may or may not be related to viral clearance [1]. Left untreated, chronic HCV infection can cause liver cirrhosis, liver failure and HCC. Of these with chronic HCV infection, the risk of cirrhosis of the liver is 15–30% within 20 years [20, 21]. The risk of HCC in persons with cirrhosis is close to 2–4% each year [22].

Epidemiology of hepatitis C infection

A recent systematic review estimated that 110 million persons have a history of HCV infection (i.e. are HCV-antibody positive) and 80 million have chronic viraemic infection [3]. Regions estimated to have a high prevalence within the general population 3.5% are Central and East Asia, and North Africa/Middle East; those with a moderate prevalence (1.5–3.5%) include South and South-East Asia, Sub-Saharan Africa, Latin America, the Caribbean, Oceania, Australasia, and central, eastern and western Europe. whereas low-prevalence 1.5% regions include Asia–Pacific, Latin America,

and North America [3].Updated estimates in Africa show a HCV prevalence of 2.98%, with a higher prevalence determined in West Africa and lower in south-east Africa [23].

According to estimates from the worldwide Burden of disease study, the number of deaths because of hepatitis C exaggerated from 333 000 in 1990 to 499 000 in 2010 and 704 000 in 2013[24, 1, 2].

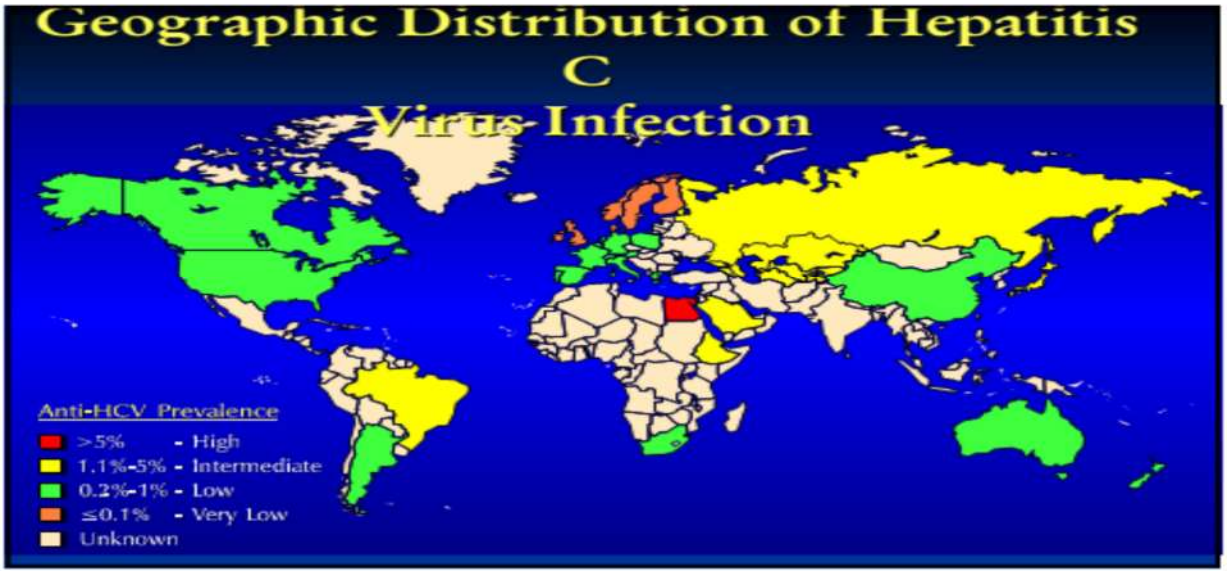

Figure 2 Geographic distribution of hepatitis C virus (Norderstedt et al., 2010)

Transmission of hepatitis C infection

There are four main routes of transmission: healthcare- associated transmission, injecting drug use, mother-to-child transmission and sexual transmission. In low and middle income Countries, infection with HCV is most commonly related to unsafe injection practices, and invasive procedures in health-care facilities with inadequate infection management practices, like renal dialysis and unscreened (or inadequately screened) blood transfusions [25, 26, 27]. Other routes of blood borne transmission include acquisition by health-care workers, cosmetic procedures (such as tattooing and body piercing), scarification, circumcision and intranasal drug use [28, 29, 30].

Prevention of hepatitis C infection

In the absence of a vaccine for hepatitis C, prevention of HCV infection depends up on reducing the risk of exposure to the virus. This can be difficult due to the varied routes of transmission and also the different populations that are affected. Globally, most HCV infections occur in health-care settings as results of inadequate infection control procedures. WHO has published guidelines with recommendations for preventing health-care-associated HCV infection, and for screening of blood product [31, 32].

Treatment of hepatitis C infection

A new category of medicines, referred to as direct-acting antiviral (DAAs), have transformed the treatment of HCV, with regimens that may be administered for a short period (as short as eight weeks), leading to cure rates more than 90th, however are related to fewer serious adverse events than the previous interferon containing regimens. WHO updated its hepatitis C treatment guidelines in 2016 to provide recommendations for the use of recent DAAs [33].

1.2 Statement of the problem

Viral hepatitis is a world public health problem affecting millions of individuals every year, causing disability and death around 500 million individuals chronically infected with hepatitis B virus (HBV) or hepatitis C virus (HCV) within the world. Approximately 1.4 million individuals die each year (~2.7% of all deaths) from causes associated with viral hepatitis, most commonly liver disease, including liver cancer [34].

Estimated 57% of cases of liver cirrhosis and 78% of cases of primary liver cancer result from HBV or HCV infection [35]. Viral hepatitis places a heavy burden on the health care system due to the costs of treatment of liver failure and chronic liver disease. In many countries, viral hepatitis is the leading cause of liver transplants. Such end-stage treatments are expensive, simply reaching up to many thousands of dollars per person [33]. Chronic viral hepatitis also leads to loss of productivity [36]. The early information on viral hepatitis indicates that from 1990 to 2005 the prevalence of HBV infection was reduced on the average below 2% in Central and Tropical Latin American regions, where as it remained between 2% and 4% within the Caribbean, Indian and Southern Latin American regions [37].

All countries within the African Region consider viral hepatitis an urgent public health issue. The burden of viral hepatitis, although not accurately known, is believed to be one of the highest within the world. Hepatitis A, B, C and E are the types mostly found within the Region. The prevalence of HBV is estimated at 8% in West Africa and 5-7% in Central, eastern and Southern Africa. The prevalence of HCV is even higher in some areas, reaching levels of up to 10% the worries [38].

Studies from the Horn of Africa, particularly Ethiopia, report HBsAg carriage rate between 5.4% and 15% and anti-hepatitis C virus positivity between 0.8 and 5.1% in the different groups Considered [39].

Several researchers have investigated prevalence rates of HBV and HCV infections in various groups (patients with chronic liver infection, health science students, blood donors, medical waste handlers and others) [8, 51, 52, and 53]. As to my best knowledge there is no study done on the prevalence, knowledge, attitude and practice of Federal police crime prevention staffs towards hepatitis B virus (HBV) and hepatitis C virus (HCV) in Addis Ababa, Ethiopia. Therefore, this study was designed to determine the prevalence, knowledge, attitude and practice of Federal police crime prevention staffs towards hepatitis B virus (HBV) and hepatitis C virus (HCV) in Addis Ababa, Ethiopia and fill the existing information gap among federal Police staffs.

1.3 Significance of the study

In view of the fact that viral hepatitis is key public health problems that pose an enormous risk for disease transmission in the general population, especially people who lives in crowded area like in military camp. Therefore, Prevention is the only safe strategy against high prevalence of HBV and HCV. Having enough knowledge, proper attitude and practice towards this infection are the corner-stones of preventing the spread of the virus. The investigation of this study helps the target groups to know the disease status and to take prevention for themselves and their family. It also helps for already exposed individuals to take treatments. It is also used to generate current and relevant information on the prevalence, knowledge, attitude and practice of Federal police crime prevention staffs towards hepatitis B virus (HBV) and hepatitis C virus (HCV) in Addis Ababa, Ethiopia. Moreover, the finding of the study uses to formulate preventive mechanisms to halt the spread of the disease in Federal police as well as in the general population. Finally, the information obtained from knowledge; attitude and practice of participants (population under investigation) about the disease can give clue to the responsible bodies for planning health education program based on the level of understanding of targeted group.

2. Literature Review:

Globally hepatitis B virus (HBV) and hepatitis C virus (HCV) infection are major causes of acute and chronic liver disease (e.g. cirrhosis and hepatocellular carcinoma), and cause an estimated 1.4 million deaths annually. It is estimated that, at present, 248 million people are living with chronic HBV infection, and that 110 million persons are HCV-antibody positive, of which 80 million have active viraemic infection [1].

A cross-sectional Study was conducted by Livia M. *et al* in Brazil to evaluate a prevalence of HBV and HCV among military personnel working in Rio de Janeiro south east Brazil. The investigators selected 433 military male personnel in the age range of 18–25 years old were screened for prevalence of HBV and HCV. All individuals tested negative for HBsAg or anti-HBc IgM markers;18 (4.1%) were anti-HBc/anti-HBs reactive, indicating previous HBV infection, and 247 (57.0%) individuals presented isolated positivity for anti-HBs, showing HBV immunity secondary to vaccination. Anti-HCV was detected in three individuals, resulting in an overall prevalence of 0.7% and at univariate analysis; age-group was associated to anti-HBc and anti-HBs positivity. They concluded that this study shows a low prevalence of HBV and HCV infection among Brazilian military personnel, reflecting the success of universal immunization toward the eradication of HBV transmission [40].

Another study conducted by Pankaji Puri B. *et al* 2016 in India to determine viral hepatitis: Armed forces perspective. They selected more than 22,000 recruits from 25 training centers and from them a total of 0.93% was seropositive for HBsAg and 0.44% for HCV. The investigators concluded that parenterally transmitted hepatotropic viruses have a lower reported prevalence in Armed Forces personnel compared to national data; this still constitutes a large burden of disease in the Armed Forces. They consider instituting a screening programme at the entry level for recruits from areas of high prevalence of HBV and HCV [41].

A cross-sectional study conducted by Yuan-Yuan L. *et al* in China to determine knowledge about hepatitis B among new military recruits in China. They conducted a prospective cross-sectional survey using a newly developed questionnaire among 800 new military recruits. Out of a total of 800 questionnaires sent out, 792 questionnaires were returned completed. Of the 727 respondents, 665 were male (91.5%) and 62were female (8.5%), with a mean age of 18.9 ± 1.7 years. Their investigation showed that a total of 608 respondents (83.6%) demonstrated poor knowledge and 119(16.4%) adequate knowledge about HBV. Older age, female and higher education level were

statistically associated with higher total knowledge scores. They concluded that against of backdrop of high HBV prevalence in china, new recruits had poor knowledge of HBV and new recruits need better education about HBV to assist in reduction and prevention HBV infection [42].

Reyes P. *et al,* conducted a cross-sectional study in Philippines 2016 to determine the level of assessment on knowledge, attitude and practice (KAP) on Hepatitis B and C, prevalence, and risk factors among high-risk individuals. Of the 450 respondents, 32 (7.1%) were infected with HBV and 19 (4.2%) were infected with HCV. only 5 (1.1%) were infected with both HBV and HCV. Majority of the respondents answered that they had knowledge on a disease termed hepatitis (85%), a disease termed as hepatitis B or C (78%), however, majority of them replied that they do not have knowledge in terms of: hepatitis B and C are viral diseases (84%), that the diseases could cause liver cancer (77%), that the diseases could be transmitted by using blades of the barber or ear and nose piercing (57%), that the diseases could be transmitted by unsafe sex (78%).The investigators concluded that there is a lack of understanding of the basics of infection control and the prevention of transmission of Hepatitis B and C. Health education campaign should be provided [43].

The systematic review by Pimpin L .*et al*, 2018 in Europe, titled by Burden of liver disease in Europe: Epidemiology and analysis of risk factors to identify prevention policies. They extracted information on historical and current prevalence and mortality from national and international literature and databases on liver disease in 35 countries in the World Health Organization European region, as well as historical and recent prevalence data on their main determinants; alcohol consumption, obesity and hepatitis B and C virus infections. They extracted information from peer reviewed and grey literature to identify public health interventions targeting these risk factors. Their data was supplemented with data from WHO European Health for all databases for broader categories of liver disease (1970 to 2015). The result indicates that the prevalence of HBV range from 1% to 8% and HCV 0.1% to 5.9%. The study groups suggest that the Liver disease in Europe is a serious issue, with increasing cirrhosis and liver cancer [44].

A study conducted by Kupcinskas, L *et al in* Lithuania to determine prevalence of hepatitis B serological markers (hepatitis B virus (HBV) superficial antigen (HBsAg)) and risk factors for HBV infection among Lithuanian Army soldiers. They selected 1,830 army soldiers average age 21.6 and from them a total of 1.97% was seropositive for HBsAg. Their investigation showed that there is association among soldiers who were a lower education level and soldiers offered to drug

use. The investigators concluded that HBV infection distribution among Lithuania Army soldiers is equal to the Lithuanian population and the results from this study support the need for examination of all conscripts to detect HBsAg, vaccination against HBV infection, and health education programs in the Lithuanian Army [45].

German V.*et al* conducted a cross-sectional study in Greece to investigate serologic indices of hepatitis B virus infection in military recruits in Greece (2004–2005). The investigators selected 1,840 army recruits and from them only 6 (0.32%) were positive to HBsAg. Their analysis showed that younger age and advanced education level were independently associated with serologic evidence suggestive of previous HBV vaccination. Overall, 1,144 recruits (62.17%) had antibodies against HBsAg [HBsAg (-)/anti-HBsAg (+)/anti-HBcAg (-)]; 665 recruits (36.14%) had undetectable anti-HBsAg levels. They generalized a further decline of prevalence of chronic HBV infection among Greece military recruits; a fact that may support the effectiveness of the ongoing immunization programs [46].

A cross-sectional study conducted by Souly K.*et al* in Rabat capital city of Morocco to determine sero-prevalence of viral hepatitis B (HBV) and C (HCV), frequency occurrence of blood exposure accidents (BEA) and identifies key risk factors for infection among health care personnel of Ibn Sina Hospital in Rabat. From 601 participants 242 (40.26%) men and 359 (59.74%) women; the mean age was 42.30 years (range 22 to 59). The study result shows HBsAg was positive in 19 cases (3.16%) and HCV-Ab was positive in 15 cases (2.50%). No HBV and HCV co infection was detected. They concluded that the prevalence of serological markers of viral hepatitis B and C in their hospital personnel exceeds that of general population so the establishing of a correct vaccination scheme against viral hepatitis B are urgently required to decrease the risk of infection with hepatitis B and C viruses and protect the medical staff in Morocco[47].

Shalaby S. *et al* conducted a cross-sectional study in Egypt 2010 to determine Hepatitis B and C viral infection: prevalence, knowledge, attitude and practice among barbers and clients in Gharbia governorate, Egypt. They selected 616 subjects (308 pairs of barbers and clients) were included: 322 from urban areas (161 pairs) and 294 from rural settings (147 pairs). HBsAg was detected in 25 individuals (13 barbers and 12 clients), an overall prevalence of 4.1% and Anti-HCV antibodies were detected in 77 individuals with an overall prevalence of 12.5%. Knowledge was high among the majority of participants and good practice during shaving and hair cutting were observe for the majority of barbers. They concluded that a very similar

infection rate of HBV and HCV among barbers and their clients to that reported nationally. Barbers appeared to have no job-related risk of acquiring viral hepatitis [48].

Another cross-sectional Study was conducted by Umumararungu E. *et al* in Rwanda to evaluate a Prevalence of Hepatitis C Virus Infection and Its Risk Factors among Patients Attending Rwanda Military Hospital, Rwanda. They selected randomly 324 patients attending Rwanda Military Hospital. Their study shows 16.0%of Anti-HCV antibody and 9.6% of active HCV infection were found in total participants. The HCV infection was significantly higher in the older age population (>55 years) and exposure to injection from traditional practitioners was identified as a significant risk factor of infection. They generalize further studies to determine the factors causing the high prevalence of HCV in Rwanda are recommended [49].

The systematic review and meta-analysis by Belyhun Y.*et al*, 2016 in Ethiopia, The research focused on all published studies with epidemiological and/or clinical data on the seroprevalence of hepatitis viruses (HAV, HBV, HCV, HDV, and HEV) in Ethiopia from the first scientific description (1968) to 2015. The total study population size screened for hepatitis viruses and involved in this systematic review and meta-analysis was 79,931. Among these, 62,955 were screened for hepatitis viruses from the general population. The study result indicates that the overall pooled prevalence of hepatitis B virus (HBV) was 7.4% (95%CI: 6.5–8.4) and anti-hepatitis C virus antibody (anti-HCV) was 3.1% (95%CI: 2.2–4.4). The investigators concluded that all types of viral hepatitis origins are endemic in Ethiopia. Adapting a recommended diagnostic and treatment algorithm of viral hepatitis in the routine healthcare systems and implementing prevention and control policies in the general population needs an urgent attention [50].

Birku T. *et al* conducted a cross-sectional study in Bahirdar town, Ethiopia, to determine Prevalence of hepatitis B and C viruses' infection among military personnel at Bahirdar Armed Forces General Hospital from the 1st of February to the 30th of May 2015. They selected 403 military personnel and the majority of the study subjects 362 (89.8 %) were male and the mean age of the study participants was32.6 ± 7 SD years. The study indicated that overall prevalence 17 (4.2 %) was positive for HBV and only one individual was positive for HCV. However, none of the soldiers were co-infected by HBV and HCV. They concluded that intermediate prevalence of HBV and low prevalence of HCV were observed among military personal and strengthening HBV screening among military personal may further reduce these viral disease [8].

A cross-sectional study conducted by Demises W.*et al* in Northeast Wollo, Ethiopia, to determine Hepatitis B and C Sero-prevalence, knowledge, practice and associated factors among medicine and health science students. The investigators selected a total of 408 medicine and health science students from March to September 2017. Their investigation showed that sero-prevalence of HBV infection was 4.2% and 0.7% for HCV, 331 (81.1%) of the study participants had adequate knowledge on hepatitis B & C infection, its mode of transmission and preventive measures. The investigators concluded that a high sero-prevalence but poor practice of hepatitis B and C virus infection was found in the study area despite their good knowledge towards occupational risk of viral hepatitis infection [51].

Another cross-sectional study conducted by Mesfin YM. *et al* 2013 in Haramaya, Ethiopia to determine Knowledge and Practice towards Hepatitis B among Medical and Health Science Students in Haramaya University, Ethiopia. They selected 322 health science and medical students who are starting clinical attachment (year II, III, IV, V and IV). Majority of the students (91%) were in the age group 20–24 and 232 (72%) of the respondents were male. Majorities (95.3%) of students were not fully vaccinated against Hepatitis B and 48.4% of the students were not aware about the availability of post exposure prophylaxis for HB. They concluded that lack of awareness about Hepatitis B, its route of transmission and modes of prevention among the medical students entering into the profession. Similarly, 95.3% the students were not fully vaccinated against Hepatitis B, which makes them vulnerable to the disease [52].

A cross-sectional Study conducted by Mekonnen *A.et al* in Addis Ababa to determine the Prevalence of HBV, HCV and Associated Risk Factors Among Cleaners at Selected Public Health Centers in Addis Ababa, Ethiopia. The investigators selected a total of 252 public health center cleaners from May to September 2014. Their finding showed that HBV were detected in 9 (3.57%) and HCV in 4 (1.59%). Of the 9 HBV positive subjects 1(11.1%) was male and 8(3.3%) were females. However, all of the HCV positive study participants were females. Their investigation showed that none of the observed risk factors of HBV and HCV were significantly associated with the occurrence of hepatitis infection. They concluded that prevalence of HBV and HCV is higher in the study setting as it also revealed by other researches in our country. Therefore, it is important to implement a screening program for these diseases at large [53].

Girma A.*et al* conducted a cross-sectional study in 2012 Addis Ababa, Ethiopia to evaluate Prevalence and Risk Factors of Hepatitis B and Hepatitis C Virus Infections among Patients with

Chronic Liver Diseases in Public Hospitals in Addis Ababa, Ethiopia. They conducted on 120 clinically diagnosed chronic liver disease patients and from them Hepatitis B surface antigen was detected in 43 (35.8%) and anti-HCV antibody 27(22.5%) patients clinically diagnosed to have chronic liver diseases. Hepatitis B virus infection was higher in males 29/76 (38.2%) compared to 14/44 (31.8%) females, while hepatitis C virus antibody was higher in females 13/44 (29.5%) compared to 14/76(18.4%) males. Of the study participants, 3 (2.5%) had dual hepatitis B and C virus co infection. The investigators generalized that prevalence of hepatitis B surface antigen and anti-HCV antibody was high in patients below 50 years of age and Dental extraction procedure at health facility was associated with hepatitis C virus [54].

3. Objectives

3.1 General objective

Determining the prevalence, knowledge, attitude and practice of Federal police crime prevention staffs towards hepatitis B virus (HBV) and hepatitis C virus (HCV) in Addis Ababa, Ethiopia.

3.2 Specific objectives

- To determine the prevalence of HBV among Federal police crime prevention staffs in Addis Ababa, Ethiopia.
- To determine the prevalence of HCV among Federal police crime prevention staffs in Addis Ababa, Ethiopia.
- To assess the knowledge, attitude and practice among Federal police crime prevention staffs towards HBV and HCV in Addis Ababa, Ethiopia.

4. Hypothesis

Null hypothesis (HO)

There is no difference in the Prevalence, knowledge, attitude and practice of federal police crime prevention staffs towards HBV and HCV with the other study conducted in Ethiopia.

5. Materials and methods

5.1. Study area

The study was conducted in Addis Ababa City Administration which is the capital city of the Ethiopia. A population of 3,384,569 according to the 2007 population census with annual growth rate of 3.8%. This capital city holds 527 square kilometers of area in Ethiopia and the population density was 5,165.1/km2); all of the population is urban inhabitants. All Ethiopian ethnic groups are represented in the city. Around 30,000 federal police staffs found in Ethiopia and from them approximately 13,500 are in Addis Ababa. The investigation focused on the federal police staffs selected from four sub-cities (Lideta, Bole, Arada, and Kolfe) out of ten sub-cities of Addis Ababa.

5.2. Study design and period

Institutional based cross-sectional study was conducted to determine the prevalence of HBV and HCV by taking blood samples and screened sera with rapid test. Positive tests were further tested with ELISA, and KAP was assessed using a semi-structured questionnaire. The study was conducted from December 2018 to June 2019 at Addis Ababa, Ethiopia.

5.3. Population

5.3.1. Source population

The source population was all federal police staffs in Addis Ababa, Ethiopia.

5.3.2. Study Population

The study population was all federal police crime prevention staffs around study area who meet the inclusion criteria and selected for the study.

5.4. Inclusion and exclusion criteria

5.4.1. Inclusion criteria

All federal police crime prevention staffs those present in the work area during data collection day.

5.4.2. Exclusion criteria

- Those who are unable to communicate for different reasons
- Those who knew their status of HBV and HCV
- Those who have critical health problems

5.5. Study variables

5.5.1. Dependent variables

- Prevalence of HBV and HCV among federal police crime prevention staffs in Addis Ababa, Ethiopia.
- Knowledge, attitude and practice of federal police crime prevention staffs towards HBV and HCV in Addis Ababa, Ethiopia.

5.5.2. Independent variables

- Socio demographic (Age, sex, marital status, position, educational status, background residence (rural and urban).

5.6. Sample size calculation and Sampling method

5.6.1. Sample size calculation

The sample size is calculated using a formula for single population proportion considering the following assumptions

Assumptions: With the assumptions of Confidence interval = 95%, Critical value Zα/2 = 1.96, Degree of precision d = 0.05. The proportion (p) = 50% since there was no research done in the same setting as this study concerning prevalence of HVB, HCV and knowledge, attitude and practice of federal police crime prevention staffs. Non-response rate 10%.

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

Where, n= the required sample size

Z α/2= the standardized normal distribution curve value for the 95% confidence interval (1.96)

P= the level of KAP of federal police crime prevention staffs were unknown so we take as 50%

d= degree of precision (the margin of error between the sample and population, 5%) = 0.05

$n = \frac{(1.96)2(0.5(1-0.5))}{(0.05)^2}$

n= 384

By taking additional 10% contingency for non-response rate, the sample size was = 422.

However, we have collected 500 samples.

5.6.2. Sampling Method

Among the seven directorates in federal police crime prevention, five directorates are not included under this study, because rapid police directorate is out of Addis Ababa (study area) and the other four are not participate in crime prevention work. The two directorates' selected for this study each have four divisions giving a total of eight divisions. From them, four divisions were selected randomly from the two directorates. The study participants were selected from each divisions by proportion to population size based on the total number of police in each division. Systematic random sampling method was used to select specific police from the selected divisions by using their list in the role sheet.

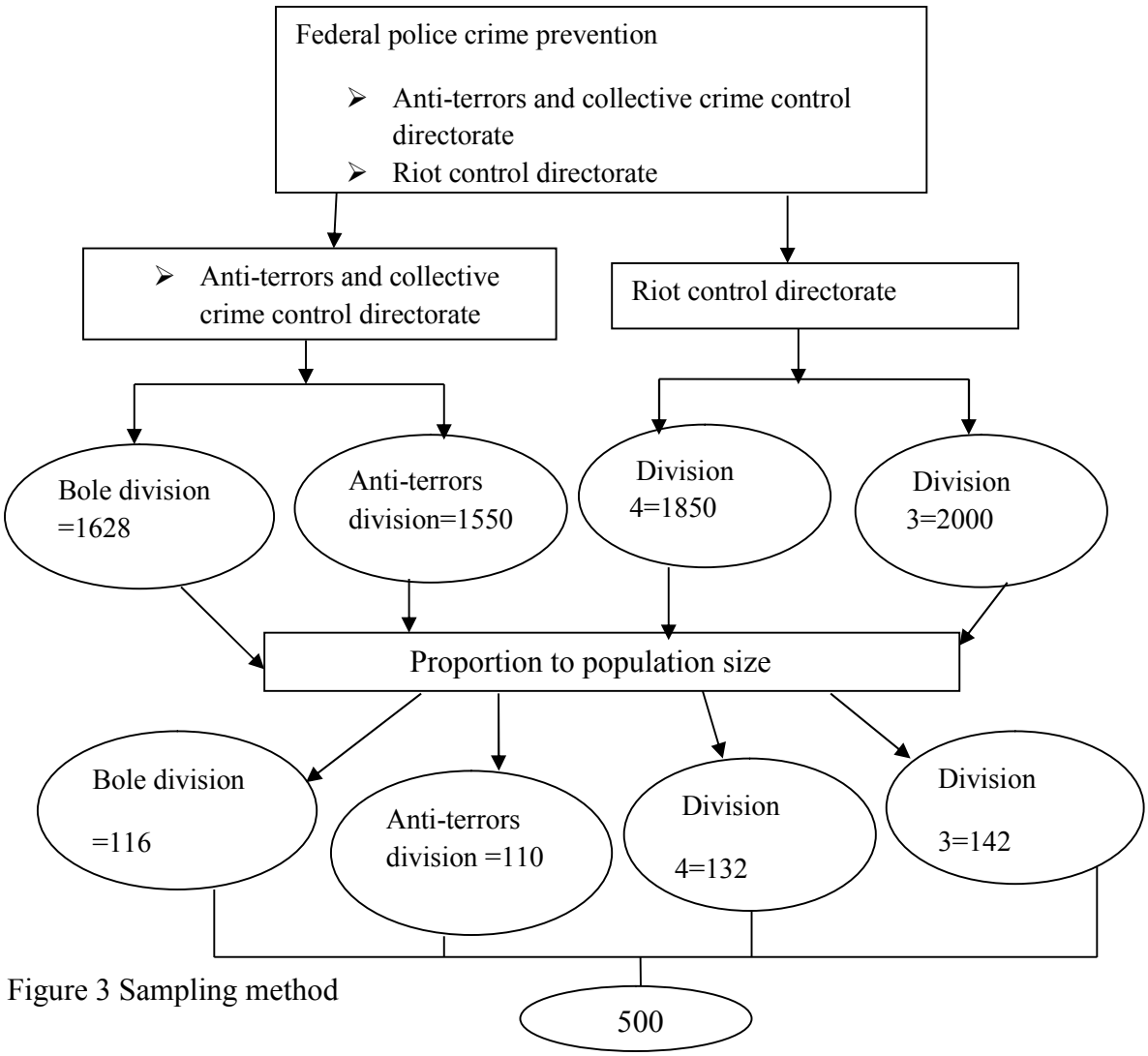

Figure 3 Sampling method

5.7. Measurement and Data collection

5.7.1. Data collection procedure

5.7.1.1. Demographic data collection

Written consent was obtained from study groups and then questionnaire was used to collect information about knowledge, attitude and practice of the disease and to assess the socio demographic characteristics of the study participants.

The questionnaire was prepared by principal investigator in simple understandable language, Amharic and English. The pre-designed questionnaire was pre-tested on 5% of federal police in the camp other than the study participants in order to check the applicability and then necessary modifications were made accordingly. Information was given to the study participants about; the benefit of the study, individual's right, informed consent before the data collection started.

5.7.1.2. Specimen collection and processing

After obtaining the participant written consent, five milliliter of venous blood was collected from each participant using gel and clot activator tubes. The tubes were labeled, processed at the time of collection and transported to the laboratory. The blood was allowed to clotting and serum was separated by centrifugation at room temperature at 10,000 rpm for ten minutes. After separation, all serum samples were tested for HBsAg and HCV with rapid screening method according to the manufacturer's instruction of the selected test kit and leftover sera were stored in the freezer at -20 ^{o}C. All rapid positive tests were confirmed using ELISA at national blood bank.

5.7.2. Laboratory analysis

5.7.2.1 HCV rapid test principle

Ecotest (Hangzhou Co., Ltd. China) HCV Test strip (serum/plasma) detects antibodies to HCV through visual interpretation of color development in the internal strip. Recombination of HCV antigen is immobilized on the test region of the membrane. During testing the specimen reacts with recombinant HCV antigen conjugate to colored particles and precoated onto the sample pad of the test. The mixture then migrates through the membrane by capillary action and interacts with reagents on the membrane. If there are sufficient HCV antibodies in the specimen, a colored band will form at test region of membrane. The presence of a colored band indicates a positive result, while the appearance of colored band at control region serve as a procedural control, indicating that the proper volume of specimens has been added and membrane wicking has occurred.

Interpretation of results

Positive (+): Two colored bands appear on the membrane. One band appears in control region (C) another band appears in the test region (T).

Negative (-): Only one colored band appears, in control region (C). No apparent colored band appears in the test region (T).

Invalid: No visible band at all, there is a visible band only in the test region but not in control region. Report with a new test kit. If test still fails, please contact the distributer or the store, where you bought the product with the lot number.

5.7.2.2 HBsAg rapid test principle

Wondfo (Guangzhou wondfo biotech co., Ltd, china) one step HBsAg serum/plasma Test cassette is a rapid immunochromatographic test for the visual detection of hepatitis B surface antigen (HBsAg) in serum/plasma samples. When the specimen is added in to the test device, the specimen is absorbed in to the device by capillary action, mixes with the antibody conjugate and flows across the pre-coated membrane. When the antigen levels are at or above the detection limit of the test, HBsAg in the sample combines to the antibody conjugated in the pad then are captured by the anti-body immobilized in the Test Region (T) of the device. This produces a visible colored band in the Test Region (T), which indicates a positive result. When the antigen level is zero or below the detection limit of the test, there will be no colored band in the Test Region (T), which indicates a negative result. To serve as a procedure control, a colored line will appear at the control Region(C).

Interpretation of results

Positive (+): Rose –pink bands are visible both in the control region and the test region. This positive result indicates the concentration of HBsAg is equal to or higher than the detection limit of the test.

Negative (-): A rose-pink band is visible in the control region. No color band appears in the test region. A negative result indicates that HBsAg is zero or below the detection of the test.

Invalid: No visible band at all, there is a visible band only in the test region but not in control region. Report with a new test kit. If test still fails, please contact the distributer or the store, where you bought the product with the lot number.

5.7.2.3 HBsAg ELISA test principle

Murex HBsAg version 3 UK this is a Sandwich Enzyme linked Immune-sorbent assay method in which polystyrene micro well strips are pre-coated with monoclonal antibodies specific to HBsAg. Participant's serum or plasma sample is added to the micro-wells together with a secondary antibody conjugated with horseradish peroxidase (HRP) and directed against a different epitope of HBsAg. During incubation, the specific immune-complex formed in the case of presence of HBsAg in the sample, is captured on the solid phase. After washing to remove sample serum protein and unbound HRP conjugate, chromogen solution containing Tetra-methyl Benzedrine (TMB) and urea peroxidase are added to the walls. In the presence of the antibody-antigen-antibody (HRP) sandwich immunecomplex, the colorless chromogens are hydrolyzed by the bound HPR conjugate a blue colored product. The blue color turns to yellow after stopping the reaction with sulfuric acid. The amount of color can be measured and is proportional to the amount of antigen in the sample (Test kit insert sheet).

Interpretation of Results

Non-Reactive Results: Samples giving an absorbance less than the Cut-off Value are considered non-reactive in Murex HBsAg Version 3.

Reactive Result: Samples giving an absorbance equal to or greater than the Cut-off Value are considered initially reactive in the assay

5.7.2.4 Anti-HCV ELISA test principle

Woodland Hills, California, 91367, USA. This is Polystyrene micro-well stripes are pre-coated with recombinant, highly immune-reactive antigens corresponding to the core and non-structural regions of HCV. During the first incubation step, anti- HCV specific antibodies, if present, will be bound to the phase pre-coated HCV antigens. The wells are washed to remove unbound serum proteins, and rabbit antihuman IgG antibodies (anti- IgG) conjugated to HRP is added. During the second incubation step, these HRP conjugated antibodies will be bound to any antigen- antibodies complexes previously formed and the unbound HRP-conjugate is then removed by washing. Chromogen solutions containing Tetra-methyl Benzedrine (TMB) and urea peroxidase are added to

the wells and in presence of the antigen antibody- anti-IgG (HRP) immune-complex; the colorless chromogens are hydrolyzed by the bound HRP-conjugated to a blue colored product. The blue color turns to yellow after stopping the reaction with sulfuric acid. The amount of color can be measured and is proportional to the amount of antibody in the sample.

5.8. Data Quality Assurance

Prior to the beginning of any data collection, all data collectors were trained by the principal investigator on an overview of the assessment and its objectives. During the entry of data it was cross checked to assure the right data was entered correctly. All specimens were collected according to the standard operating procedure of specimen collection. The quality of test results was maintained by using the internal quality control of the test kits and by using a known negative and positive sample an external quality control.

5.9. Data analysis and interpretation

Data entry and analysis was done by using SPSS version 20.0 computer software. Data was summarized and presented in descriptive measures such as a table and percentage. To determine the correlation between the data obtained from the questionnaire and the laboratory results, odds ratios (ORs) and their corresponding 95% confidence intervals (CIs) was calculated using logistic regression analysis. Whether a variable was significantly associated with HBV and or HCV infections if the p-value < 0.05.

5.10. Operational definitions

positive: In addition to a pink colored control (C) band, a distinct pink colored band will also appear in the test (T) region, that indicate the presence of HBsAg in the serum.

Negative: only one colored band appears on the control (C) region. No apparent band on the test (T) region that indicates the absence of HBsAg in the serum.

Invalid:-No visible band at all or there is a visible band only in the test region but not in the control region

5.11. Ethical considerations

The study was carried out after it was approved by Addis Ababa University, College of Health Sciences, Department of medical laboratory Ethical Review Committee and Institutional Review Board (IRB).It was also be approved by federal police crime prevention health center Ethical Review Committee then a support letter was obtained from Addis Ababa Health Bureau. The

purpose of the study was explained to each participant and sample was obtained only after each participant gives his/ her written consent. All information obtained held securely and stored on paper and computer files with a unique identification number. No one except the interviewers knew the participant took part in the study and the answers were given by the participant marked with an especial study number only, and not the name.

5.12. Dissemination of the result

This study on completion could serve as a reference material to researchers, experts or policy makers for intervention. To reach these bodies the finalized paper was submitted to College of Health Sciences, Department of medical laboratory Addis Ababa University. So it can serve as a reference in the library. In addition, a copy of this material was given to federal police crime prevention health center and police hospital. The result was also being disseminated through publication in peer reviewed local and international journals and through presenting it in relevant workshops and seminars.

6. Work flow

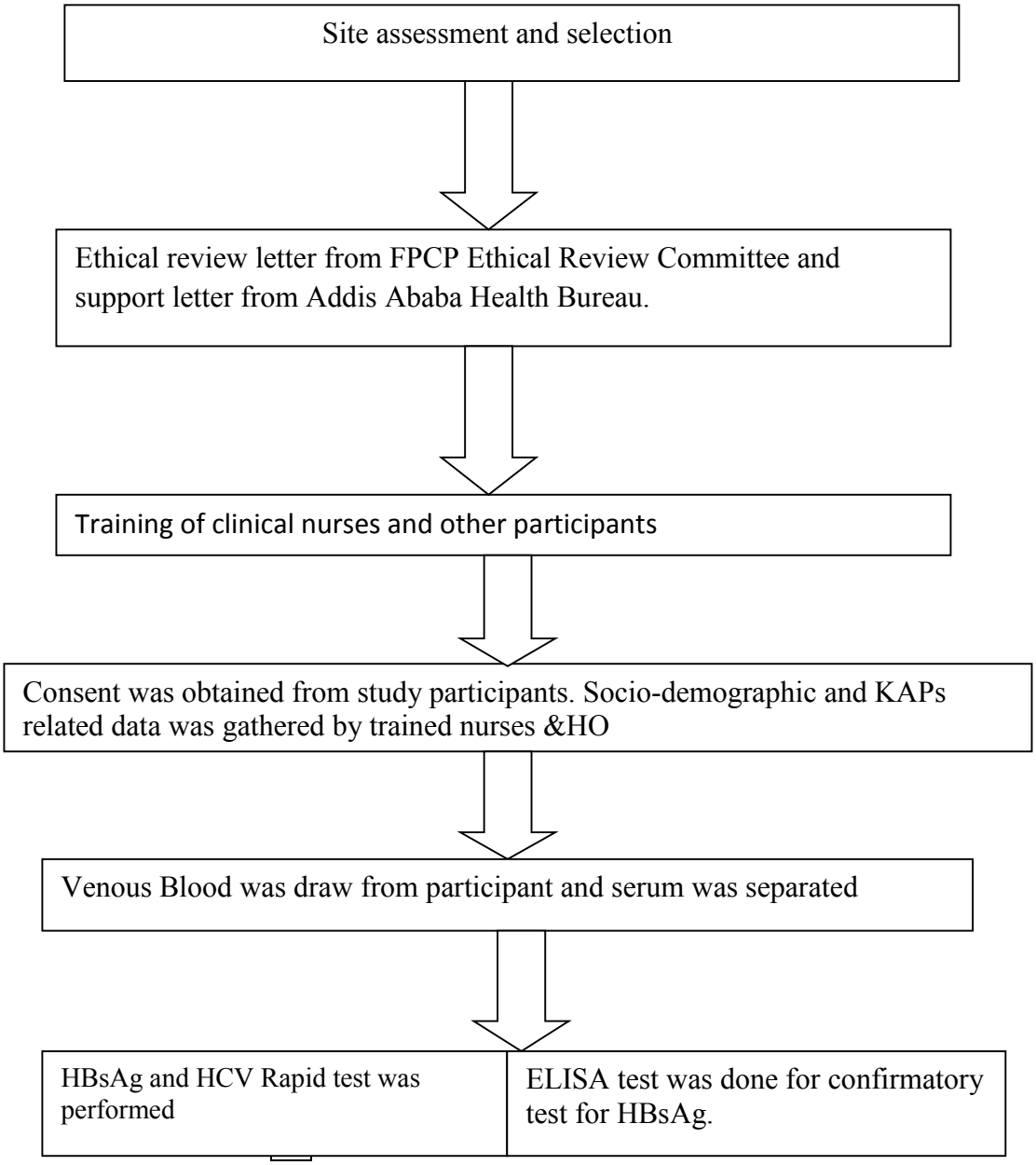

Figure 4: Workflow

7. Results

7.1. Socio-Demographic Characteristics

From the total federal police crime prevention staffs, 500 participants were selected for current study. During the study, for those selected volunteer participants have given their consent to be participating in the study and then the questionnaire was given to be filled. From total 500 participants, 81.4 % (n=407/500) were males and the remaining 18.6 % (n=93/500) were females. Large number of the study participant's, 64% (n=320/500) were belong to the age group of 18 to 25 years old with a minimum and maximum age of 18 and 52 respectively. Related to marital status, majority of the study participants were single, 59.4 % (n=297/500) and regarding to educational status, 42.6 % (n=213/500) participants were college and above while only 1.6% (n=8/500) had elementary school education. Out of the respondents 54.8% (n=274/500) were constable followed by sergeant 33.6% (n=168/500). Majority of the participants under this study, 24.8% (n=124/500) were from Amhara ethnic group followed by, 21.2% (106/500) are Oromo ethnic group. From the total participants under this study, 59.6% (n=298/500) were followers of Orthodox Christianity followed by, 28.6% (n=143/500) are protestant Christianity. The most of federal police crime prevention staffs 75% (n=375/500) were rural residence background (Table 7.1).

Table 7.1: Socio-Demographic Characteristics among federal police crime prevention staffs in Addis Ababa Ethiopia, January 2018 to June 2019 (n=500), 2019.

Variables		**Frequency(n=500)**	**Percentage (%)**
Sex	Male	407	81.4
	Female	93	18.6
Age category	18-25	320	64
	26-35	137	27.4
	>36	43	8.6
Educational background	1-8	8	1.6
	9-12	279	55.8
	Collage and above	213	42.6
Marital status	Married	196	39.2
	Single	297	59.4
	Divorced	7	1.4
	Widowed	0	0
Position	Constable	274	54.8
	Sergeant	168	33.6
	Inspector	49	9.8
	Commander	9	1.8
Ethnicity	Oromo	106	21.2
	Amhara	124	24.8
	Tigray	60	12
	Woliyta	40	8
	Others	170	34
Religion	Orthodox	298	59.6
	Muslim	51	10.2
	Protestant	143	28.6
	Catholic	7	1.4
	Others	1	0.2
Residence background	Rural	375	75
	Urban	125	25

N=total sample size

7.2. Prevalence of HBV and HCV

From total of 500 study participants included, 4.6 % (n=23/500) were positive for HBsAg and all participants were negative for HCV. From total of 407 males, 4.9% (n=20/407) and from total of 93 females 3.2% (n=3/93) were positive for HBsAg. Regarding to age category, higher prevalence of HBsAg infection 5.6 % (n=18/320) were found in age 18-25 years old. Participants who are positive for HBsAg 4.7 % (n=14/297) are single and 4.6% (n=9/196) are married. Regarding to educational background, 5.2% (n=11/213) for HBV positive federal police crime prevention staffs were educated at college and above (Table 7.2).

Table 7.2: Prevalence of HBV and HCV among federal police crime prevention staffs Addis Ababa, Ethiopia January 2018 to June 2019 (n=500), 2019.

Variables		HBsAg ELISA		Anti-HCVELISA		Total
		Pos (%)	Neg (%)	Pos (%)	Neg (%)	
Sex	Male	20(4.9)	387(95.1)	0(0)	407(100)	407
	Female	3(3.2)	90(96.8)	0(0)	93(100)	93
Age category	18-25	18(5.6)	302(94.4)	0(0)	320(100)	320
	26-35	4(3)	133(97)	0(0)	137(100)	137
	>36	1(2.3)	42(97.7)	0(0)	43(100)	43
Educational background	1-8	0(0)	8(100)	0(0)	8(100)	8
	9-12	12(4)	267(96)	0(0)	279(100)	279
	Collage & above	11(5.2)	202(94.8)	0(0)	213(100)	213
Marital status	Married	9(4.6)	187(95.4)	0(0)	196(100)	196
	Single	14(4.7)	283(95.3)	0(0)	297(100)	297
	Divorced	0(0)	7(100)	0(0)	7(100)	7
	Widowed	0(0)	0(0)	0(0)	0(0)	0
Position	Constable	14(5.1)	260(94.9)	0(0)	274(100)	274
	Sergeant	7(4.2)	161(95.8)	0(0)	168(100)	168
	Inspector	2(4.1)	47(95.9)	0(0)	49(100)	49
	Commander	0(0)	9(100)	0(0)	9(100)	9
Residence background	Rural	13(3.5)	362(96.6)	0(0)	375(100)	375
	Urban	10(8)	115(92)	0(0)	125(100)	125
Total		23(4.6)	473(65.4)	0(0)	500(100)	500

HBsAg-hepatitis B surface antigen, ELISA-Enzyme Linked Immunoassay, HCV-Hepatitis C virus

7.3. Adjusted Odds Ratio, Crude Odds ratio and p- value of HBsAg

As shown in table 7.3 below, after controlling for possible confounding variables, crude odds ratio of sex (COR=1.6, CI=0.45-5.33, P=0.486) and age category of 18-25 years (COR=0.399, CI=0.52-3.070, P=0.378) and 26-35years (COR=0.836, CI=0.86-7.279, P=0.836) are not significantly associated for HBsAg. However, residence background of the respondents was found to be significantly associated for HBsAg with (AOR =0.41:95% CI, 0.174-0.98, p- value =0.042).

Table7.3. Adjusted Odds Ratio, Crude Odds ratio and p- value of HBsAg among federal police crime prevention staff in Addis Ababa , Ethiopia, January2018 to June 2019 (n=500).

Variables		HBsAg Positive	HBsAg Negative	COR	CI (95%)	AOR	CI (95%)	P-Value
Sex	Male	20(4.9)	387(95.1)	1.6	0.45-5.33	1.8	0.51-6.3	0.486
	Female	3(3.2)	90(96.8)	1				
Age Category	18-25	18(5.6)	302(94.4)	0.399	0.52-3..070			0.378
	26-35	4(3)	133(97)	0.836	0.86-7.28			0.836
	>36	1(2.3)	42(97.7)	1				
Education	1-8	0(0)	8(100)					
	9-12	12(4)	267(96)					
	Collage and above	11(5.2)	202(94.8)					
Marital	Married	9(4.6)	187(95.4)					
	Single	14(4.7)	283(95.3)					
	Divorced	0(0)	7(100)					
Position	Constable	14(5.1)	260(94.9)					
	Sergeant	7(4.2)	161(95.8)					
	Inspector	2(4.1)	47(95.9)					
	Commander	0(0)	9(100)					
Residence background	Rural	13(3.5)	362(96.6)	1				
	Urban	10(8)	115(92)	**0.41**	**0.176-0.97**	**0.41**	**0.174-0.98**	**0.042**

AOR=adjusted odds ratio

COR=crude odds ratio **CI=confidence interval**

7.4. Knowledge, Attitude and Practices (KAP) assessment on HBV and HCV

7.4.1. Knowledge of participant

As can be observed in table 7.4, out of 500 participant's 51% (n=255/500) were never heard about HBV and HCV. Majority of the study participants are correctly identified the basic transmission roots. From this, 91% (n=455/500) responded as the transmission takes place through blood and blood products, 90% (n=450/500), responded as it takes place through injury with contaminated needle and sharp material, and also 92.6% (n=463/500) participants responded sexual intercourse as rout of transmission. However, most participants 66.4% (n=332/500) and 61% (n=305/500) incorrectly identified that HBV and HCV can be transmitted by feco-oral and contaminated water. In case of vaccine 84.2% (n=421/500) have information about availability of HBV vaccine and 65% (n=325/500) know that there is effective treatment for HBV and HCV (Table 7.4).

7.4.2. Attitude of participants

The majority of the study participants 69.8% (n=349/500) believe that their job puts them at high risk of acquiring of HBV and HCV. In this study 84.6% (n=423/500) federal police crime prevention staffs agreed that taking of HBV vaccine is safe. About 86.4% (n=432/500) participants were considering that HBV and HCV are serious public health problems and 74.8% (n=374/500) participants were believed that vaccine of HBV is costs too much (Table 7.4).

7.4.3. Practice of participants

All of 100% (n=500/500) the study participants were not having history of HBV and HCV. The majority of the study participants 58.8% (n=294/500) were sharing sharp materials with others. Most participants, 99.6% (n=498/500) were not vaccinated to HBV. (Table 7.4).

Table7.4. Knowledge, Attitude and Practice of federal police crime prevention staff towards HBV and HCV in Addis Ababa , Ethiopia, January 2018 to June 2019 (n=500), 2019

Knowledge assessment questions	**(n=500) Yes (%)**	**(n=500) No (%)**
Do you know or have you heard of Hepatitis B&C?	245(49)	255(51)
Is Hepatitis transmitted through blood and blood products?	455(91)	45(9)
Is Hepatitis transmitted through needle and sharp material injury?	450(90)	50(10)
Is Hepatitis transmitted through sexual intercourse?	463(92.6)	37(7.4)
Is Hepatitis transmitted through feco-oral?	332(66.4)	168(33.6)
Is Hepatitis transmitted through contaminated water?	305(61)	195(39)
Does HBV have vaccine?	421(84.2)	79(15.8)
Is there effective treatment for HBV and HCV?	325(65)	175(35)
Attitude assessment questions		
Do you think your job puts you at a high risk of acquiring Hepatitis B and C virus?	349(69.8)	151(30.2)
Do you think hepatitis B vaccine costs too much?	374(74.8)	126(25.2)
Do you think taking HBV vaccine is safe?	421(84.2)	79(15.8)
Do you believe hepatitis infection is serious public health problem?	432(86.4)	68(13.6)
Practice assessment questions		
Do you have history of Jaundice or Diagnosed for liver disease?	0(0)	500(100)
Have you ever taken care of hepatitis patient?	30(6)	470(94)
History of operation/ surgery for yourself?	58(11.6)	442(88.4)
Do you have history of multi sexual partner in life?	148(29.6)	352(70.4)
Do you have sharing of sharp materials with others?	294(58.8)	206(41.2)
Do you have history of tattooing?	94(18.8)	406(81.2)
Do you have history of tooth extraction?	91(18.2)	409(81.8)
Do you have History of ear piercing?	142(28.4)	358(71.6)
Have you received HBV vaccination?	2(0.4)	498(99.6)
Do you have history of blood transfusion?	5(1)	495(99)
Have you screened for HBV and HVC?	15(3)	485(97)

HBV-Hepatitis B Virus, HCV-Hepatitis C virus.

8. Discussions

HBV and HC V infections are significant health problems around the globe. Both infections are associated with a broad range of clinical presentations ranging from acute hepatitis to chronic infection that may be clinically asymptomatic or may progress to chronic hepatitis and liver cirrhosis *[1]*.The current study was conducted to determine the prevalence, knowledge, attitude and practice of Federal police crime prevention staffs towards hepatitis B virus (HBV) and hepatitis C virus (HCV) in Addis Ababa, Ethiopia.

The prevalence of HBsAg among federal police crime prevention staffs in the current study was 23(4.6 %). This finding is in agreement with previous studies conducted in different population groups in different part of Ethiopia, systematic review of Ethiopia 7.1% [50], in Bahirdar military personnel 4.2% [8], in Northeast Wollo medicine and health science students 4.2% [51] and among cleaners at selected public health centers in Addis Ababa 3.57% [53]. Similar findings were observed in other countries among different population groups. For instance, a prevalence in morocco among health care personnel 3.16% [47], in Egypt among barbers and clients 4.1% [48] and in Philippines among high risk individuals 7.1% [43]. However, this finding was higher than the finding done in different parts of the world among military groups, such as in Brazil 0% [40], in India 0.93% [41], in Lithuania 1.7% [45] and in Greece 0.32% [46]. Variation in prevalence of HBsAg across study could be multifactorial in which difference in geographical distribution as well as population differences in terms of life style, awareness, socio-cultural environment, traditional practices, and sexual practices, medical exposure, the difference in hepatitis epidemiology, study subjects and sample size might also be the cause of such differences.

On the other hand, the prevalence of HBsAg in the current study was lower than other studies in Addis Ababa among patients with chronic liver diseases 35.8% [54]. This might be because our study populations are all volunteer federal police crime prevention staffs and most of them could be confident of their sero-status and study subjects, sample size, might also be the cause of such differences.

The highest prevalence 18(5.6%) of HBsAg was detected among federal police crime prevention staffs who were age group 18-25 followed by 26-35 4(3%), but the difference was not statistically significant 18-25 (COR=0.399, CI=0.52-3.070, P=0.378) and 26-35 (COR=0.836, CI=0.86-7.279, P=0.836). This finding was in good agreement with the study conducted in Greece military recruits all positives (0.32%) are found in the age group 19-22 [46]. The observed high prevalence of

HBsAg positivity among younger age group could be defined with the high probability of exposure for high risk health behavior.

In term of gender, 20(4.9%) male staffs were positive for HBsAg and 3(3.2%) were females, however, the difference was not statistically significant (COR=1.6, CI 95%=0.245-5.37, P=0.486). This finding is more or less similar with Bahirdar military personnel study were 14(4.2%) males and 2(4.9%) female were positive [8]. However, higher prevalence is incomparable with the study conducted in Addis Ababa among cleaners at selected public health centers male 1(11.1%) and females 8(3.3%) [53]. This difference may be due to differences in the sample size and study population of participants.

In relation to marital status, prevalence of HBsAg was higher among single participants, which was 14(4.7%) this finding was incomparable with a study conducted in Bahirdar military personnel which showed the prevalence of HBsAg among married 12(5.6%) and single 5(2.8%) [8].

As can be observed from the table 7.2, which describes the education level of the study groups, federal police crime prevention staffs who were in college level education and above had higher 11(5.2%) prevalence of HBsAg. This finding was incontrary to a study conducted in Bahirdar military personnel which shows, high school 11(6%) and college level and above 6(3.1%) [8]. Likewise, in Lithuania army groups, personnel in primary level and college level education had a prevalence of 41.7% and 25% respectively [45].

In relation to residence background, prevalence of HBsAg was higher among urban residence background participants 10(8%) than rural residence background 13(3.5%), residence background (AOR =0.41:95% CI, 0.174-0.98, p- value =0.042) significantly associated with HBsAg prevalence. This finding was incomparable with to a study conducted in Bahirdar military personnel urban 12(3.8%) and rural 5(6%) and Greece military recruits rural 5 out of 6(0.32) positives [46].

In the current study, all study participants were negative for HCV (0.0%). This result is in contrast with different studies conducted: in Bahirdar military personnel 0.2% [8], in Northeast Wollo medicine and health science students 0.7% [51], in Addis Ababa among cleaners at selected public health centers 1.59% [53], in Addis Ababa among patients with chronic liver diseases 22.5% [54], In Brazil military 0.7% [40), in Morocco among health care personnel 2.5% [47], in Egypt among barbers and clients 12.5% [48] and in Rwanda among patients attending military hospital 28.4%

[49]. This difference might be due to difference in study participants and sample size.

In this study it was assessed that the knowledge, attitudes and practices of participants towards to HBV and HCV infection are vital areas of investigation. Apart from significant number of federal police staffs 51% were responded that they have never heard about HBV and HCV infection, in other ways, they have poor knowledge about HBV and HCV infection, which is in line with studies conducted in china among new military recruits that showed 83.6% poor knowledge [42], in Philippines among high risk individuals 78% have poor knowledge and 97.6% never heard about HBV [43]. In addition, in Haramaya among medical and health science students, 76.1% never heard about HBV [52]. This is further reflected with their response for mode of transmission of HVB and HCV, where 332(66.4%) and 305(61%) believed that HBV and HCV can transmitted by feco-oral and consumption of contaminated water respectively.

With regard to participants attitude, the majority of the study participants, 349(69.8%) believe that their job puts them at high risk acquiring of HBV and HCV. In this study 423(84.6%) federal police crime prevention staffs agreed that taking of HBV vaccine is safe. Similar finding were observed in Haramaya among medical and health science students 93.2% [52].

In relation to participants practice, screening and vaccination of HBV and HCV was assessed by using questionnaire prepared. Among the total study population 485(97%) responded not screened and 498(99.6%) were not vaccinated respectively which is in line with study conducted in Philippines among high risk individuals 94% and 72% respectively [43]. The results of previous and current investigation are also in good agreement with the study carried in Haramaya among medical and health science students 85.7% and 95.3% respectively [52].

9. Strength and Limitation of the study

9.1. Strength of the study

- The research was conducted for the first time among police staffs.
- It was critically arranged that HBsAg positive participants to get further diagnosis and treatment.

9.2 Limitation of the Study

- High shortage of domestic and international (abroad) literatures done in related study area.
- Other federal police directorates were not included because of different resource constrains.
- The ELISA test was only performed for those sera which were positive by rapid tests.

10. Conclusion and Recommendation

10.1. Conclusion

The present study showed an intermediate prevalence of HBV and very low HCV infection among apparently federal police crime prevention staffs in Addis Ababa according to World Health Organization's classification.

A 4.6% and 0% overall prevalence of HBV and HCV infection respectively in our study setting among federal police crime prevention staffs in Addis Ababa that need for timely intervention strategies to alleviate the burden of HBV infection in the federal police staffs and community. This prevalence rate also calls for additional efforts regarding active screening and vaccination for all federal police staffs and public health education campaigns in the media to promote better awareness of risk factors.

In this study, age groups 18-25 had prevalence of 5.6% which was the highest prevalence. It may be at high risk and serves as a reservoir which requires routine screening and vaccine schedules (for HBV) may be important for those high risk groups. Majority of the participants had limited knowledge about the transmission and protection of HBV and HCV infection.

10.2. Recommendations

Based on the current investigation, the following recommendation forwarded

- National surveillance screening for Hepatitis B and C among Ethiopia federal police crime prevention staffs is required.
- Conducting regular health education for federal police crime prevention staffs, their family and community to prevent the transmission of hepatitis.
- Large scale study is important to make generalization among federal police staffs in Ethiopia.

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12. Annex

12.1 Annexes of Information letter to participants of the study

1. Information Sheet

Hello, how are you? My name is _____. This is an interview to be done with you for a study that is being conducted at Addis Ababa University, college of health Science, School of allied health science, department of medical laboratory sciences.

Title of the study

The title of the study is the determine the prevalence, knowledge, attitude and practice of Federal police crime prevention staffs towards hepatitis B virus (HBV) and hepatitis C virus (HCV) in Addis Ababa, Ethiopia.

Propose of the study

The purpose of the study is to determine the prevalence, knowledge, attitude and practice of Federal police crime prevention staffs towards hepatitis B virus (HBV) and hepatitis C virus (HCV) in Addis Ababa, Ethiopia.

What it will mean if you decide to take part in the study?

If you agree to participate in this study, you will participate in this interview in a private place. The interview will last for about10-20 minutes and will be facilitated by me and my colleague. During the interview, you will be asked to respond questions related to hepatitis infections and knowledge, attitude and practice. During the interview, my colleague will write down what you say. The recorded data will not contain your names or other identifying information. They will just be labeled with a study number.

The results will assist policy makers, planners and health service providers for making considerations regarding the prevalence, knowledge, attitude and practice of Federal police crime prevention staffs towards hepatitis B virus (HBV) and hepatitis C virus (HCV) in Addis Ababa, Ethiopia. It will also help to contribute in the subsequent efforts to improve prevention, diagnosis, treatment and support of viral hepatitis in relation to their family, at large in the community.

Risks and discomforts

There is no possible risk associated with participating in this study. But there is a little pain during drawing venous blood which will be collected by professional phlebotomists. You are free to decline answering any question that you do not wish to answer and you may leave our interview at any time you want to.

Confidentiality

All information obtained will be held securely and stored on paper, and computer files. No one except the interviewers will know that you took part in the study the answers that you give will be marked with a special study number only, and not your name. The data will protect information about you in this research to be the best of our ability.

Voluntary participation

Your participation is voluntary. You may withdraw from the interview at any time without giving a reason and without any penalty. If you have questions regarding this study or would like to be informed of the results after its completion, please do not hesitate to contact:

Investigator: **Tekilu Israel, Cell phone: +251913317958**

Email: **teklu59@gmail.com**

Advisors: Kassu Desta (Associate professor, PhD fellow), +251911107099

Wondatir Negatu (PhD), +251910851900

For additional information, please contact Addis Ababa University, College of Health Sciences, Department of Medical Laboratory Sciences at: **Telephone +251112755170**

ቅጽ II: ስለ ጥናቱ ማስተዋወቂያና በጥናቱ ለመሳተፍ ፈቃደኝነት መጠየቂያ የአማርኛ ቅጽ

በፌደራል ፖሊስ ወንጀል መከላከል ላይ የጉበት በሽታን የሚያመጡ ረቂቅ ተህዋሥያን ስርጭት (መጠን) ፣ግንዛቤና አጋላጭ ምክንያቶች ላይ የሚደረግ ጥናት

ስለ ጥናቱ ማስተዋወቂያ ቅፅ

ጥናቱ የሚሰራው በፌደራል ፖሊስ ወንጀል መከላከል ላይ የጉበትን በሽታን የሚያመጡ ረቂቅ ተህዋሥያን ስርጭት ፣መጠን፣ ግንዛቤና አጋላጭ ምክንያቶች የሚል ነው፤

የጥናቱ አላማ በረቂቅ ተህዋስያን የሚመጣ የጉበትን በሽታን መጠን፤ ስርጭት፣ ግንዛቤና አጋላጭ ምክንያቶችን ማጥናት ነው፡፡ ጥናቱ የሚካሄደው በአዲስ አበባ ከተማ ይሆናል፡፡ እርሰዎንም በፌደራል ፖሊስ ወንጀል መከላከል ላይ የጉበትን በሽታን የሚያመጡ ረቂቅ ተህዋሥያን ስርጭት (መጠን), ግንዛቤና አጋላጭ ምክንያቶች ተያያዥነት ያላቸውን ጥያቄዎች እንጠይቀዎታለን፡፡

ጥናቱ ለእርሰዎ ቀጥተኛ የሆነ ጥቅም ባይኖረውም ለፖሊሲ አውጭዎችና አስፈጻሚዎች እንዲሁም ለማህበረሰቡ ስለ አጋላጭ ሁኔታዎችና ስለመከላከያ መንገዶች ለማወቅ ይረዳል፡፡ በሌላ በኩልም ስለበሽታው ግንዛቤና ጥንቃቄ ለማገኘት ይረዳል፡፡ የደምዎ ናሙና በላብራቶሪ ሲመረመር ምንም አይነት ችግር ካሳየ ባለሙያ ምክር ይሰጥዎታል፡፡

እርሰዎንም በዚህ ጥናት እንዲሳተፉ በትህትና እንጠይቀዎታለን፡፡ በዚህ ጥናት በመሳተፈዎ የምናገኘው መረጃ ለጥናታችን ውጤታማነት እኒዲሁም በጥናቱ ውጤት ላይ ከፍተኛ አስተዋፅዎ ይኖረዋል፡፡ ስለዚህም በዚህ ቃለ-መጠይቅ በመሳተፈዎ ምስጋናዬ የላቀ ነው፡፡ በጥናቱ በመሳተፈዎ ምክንያት የሚመጣበዎት ምንም አይነት ችግር አይኖርም፡፡ ነገር ግን 5 ሚሊ ሊትር የደም ናሙና ለመዉሰድ መርፌ ሲገባ ከሚፈጥረዉ የቅጽበት የህመም ስሜት በስተቀር የጎላ ችግር አያመጣም፤ ምቾት ካልተሰማዎት ባለሙያ እንዲያይዎት ይደረጋል፡፡ በጥናቱ ውስጥ ስምዎ በማንኛውም ሁኔታ አይገለጽም፤ ስለሆነም የሚሠጡት መረጃ ሙሉበሙሉ ሚስጢራዊነቱ የተጠበቀ ነው፡፡ ስለዚህ በጥናቱ ለመሳተፍ የእርሠዎ ሙሉ ፈቃድ አስፈላጊ ነው፡፡ በተጨማሪም ለመመለስ የማይፈልጉዋቸው ጥያቄዎች ካሉ ጥያቄዎችን ለመመለስ አይገደዱም፡፡ አንዲሁም በጥናቱ ላለመሳተፍ ከፈለጉ የሚያመጠው ምንም አይነት ጉዳት የለውም፡፡

ቃለ መጠየቁን በተመለከተ ወይንም አጠቃላይ ስለጥናቱ ማንኛውንም አይነት ጥያቄና አስተያየተ ቢኖረዎት በሚከተሉት አድራሻዎች መጠቀም ይችላሉ፡፡

ተክሉ እስራኤል፡ ስልክ፡ሞባይል፡ 0913-31 79 58 ኢ-ሜይል፡ teklu59@gmail.com

ለተጨማሪ መረጃ፡ አዲስ አበባ ዩኒቨርሲቲ፣ የሕክምና ላብራቶሪ ሳይንስት ክፍል ይጠይቁ፡፡

ስልክ +251 112 75 51 70

12.2 Annexes of Consent Form

I have read the information sheet concerning this study (or have understood the verbal explanation) and I understand what will be required of me and what will happen to me if I take part in it. I also understand that any time I may withdraw from this study without giving a reason and without me or my families' are being affected for my refusal.

May I continue the interview?

1. Yes _____Continue the interview

2. No _____Stop the interview and thank the respondent

Witness's signature certifying that the informed consent has been given

Witness's signature _____ Date _____

Introduction to the interview

Thank you for deciding to participate in the interview and for coming to this session, previously (on the statement of consent form), we have discussed briefly on the purpose of the research, how you were identified, and your part in the research study. Now I am going to have discussion with you on the relevant topic items. Before going to the discussion, would you tell me important backgrounds such as age, educational background etc.? There is no right or wrong answers. All answers /responses/ ideas you provide are equally important and you are requested to respond honestly from your experiences and beliefs. I may interrupt and probe your ideas. Once again I would like to tell you that what we are going to discuss is very confidential and it will be used only for the research.

III. ስምምነት ማረጋገጫ ቅፅ

ከላይ በመግቢያው ላይ የተጠቀሰውን መረጃ አንብቢያለሁ ወይም በቃ ልየተሰጠኝን ማብራሪያ ተረድቻለሁ፡፡ በዚህ መሰረት ከእኔ የሚጠበቅብኝን ድርሻ በሚገባ አውቄያለሁ እናም በዚህ ጥናት ላይ በመሳተፌ ሊከሰቱ የሚችሉትን ሁኔታዎች ተገንዝቢያለሁ፡፡ ከዚህ ጥናት በማንኛውም ሰዓት ያለምንም ቅድመ ሁኔታና ምክንያት እራሴን ከተሳታፊነት የማግለል ሙሉ መብት እንዳለኝ ተረድቻለሁ፡፡ ይህን ውሳኔዬን ተከትሎ በእኔም ሆነ በቤተሰቦቼ ላይ በምንፈልገው የጤና አገልግሎት ላይ ምንም አይነት አሉታዊ ተጽዕኖ እንደማይደርስብኝ ተረድቻለሁ፡፡ በመሆኑም ስለጥናቱ ማብራሪያ የተሰጠ መሆኑን በተለመደው ፊርማዬ አረጋግጣለሁ፡፡

የተሳታፊው ስም----------ፊርማ ----------ቀን----------

12.3 Annexes of questionnaire

Addis Ababa University

College of health sciences

Department of Medical laboratory Sciences

For data collectors: For each question please encircle the answer.

If you make a mistake; simply cross out the mistake and encircle the correct choice. Identification number: ---------- Date of data collection----------

1. Socio-demographic information			
S.NO	**Questions**	**Answer**	**Remark**
1	Sex	1. Male 2. Female	
2	Age	…….years	
3	Educational status	1. No formal education 2. 1-8 3. 9-124. College and above	
4	Marital status	1. Married 2. Single 3. Divorced 4. Widowed	
5	Your position	1. Constable 2. Sergeant 3. Inspector 4. >Commander	
6	Religion	1. Muslim 2. Orthodox 3. Protestant 4.Catholic 5. Other, specify _____	
7	Residence (your background residence)	1. Rural 2. Urban	
8	Ethnicity	1. Oromo 3. Tigray 4. Gurage 2. Amhara 5. Wolayta 6. Others specify ……..	

2. Knowledge about Hepatitis B & C infection questions			
1	Do you know or have you heard of Hepatitis B&C?	1. Yes 2. No	
2	If you hear, from where did you hear?	1. Books and journal articles 2. Lectures and seminars 3. Media 4. Family and friends 5. Special workshops 6. Other specify……	
3	Which part of our organ does Hepatitis B &C affects?	1. Liver 2. Heart3. Kidneys 4. Brain 5. Not sure	
4	Route of transmission of Hepatitis B &C infection (answer each of the following choices)	1. Blood and blood products A. yes B. No 2. Needles and sharps injury A. yes B. No 3. Sexual intercourse A. yes B. No 4. Vertically from mother to child. A. yes B. No 5. Feco-oral A. yes B. No 6. Contaminated water A. yes B. No	
5	Does HBV have vaccine?	1. Yes 2. No	
6	Is there effective treatment for HBV and HCV?	1. Yes 2. No	
3. Attitude Regarding Hepatitis Band C viral infection			
1	Do you think your job puts you at a high risk of acquiring Hepatitis B and C virus?	1. Yes 2. No 3. I don't have idea	
2	Do you think hepatitis B vaccine costs too much?	1. Yes 2. No	
3	Do you think taking HBV vaccine is safe?	1. Yes 2. No	
4	Do you believe hepatitis infection is serious public health problem?	1. Yes 2. No	
4. Participants practice towards HBV and HCV infection			
1	Do you have history of Jaundice or Diagnosed for liver disease?	1. Yes 2. No	
2	Have you ever taken care of hepatitis patient?	1. Yes 2. No	
3	History of operation/ surgery for yourself?	1. Yes 2. No	
4	Do you have history of multi sexual partner in life?	1. Yes 2. No	
5	Do you have sharing of sharp materials with others?	1. Yes 2. No	
6	Do you have history of tattooing?	1. Yes 2. No	
7	Do you have history of tooth	1. Yes 2. No	

	extraction?		
8	Do you have History of ear piercing?	1. Yes 2. No	
9	Have you received HBV vaccination?	1. Yes 2. No	
10	Do you have history of blood transfusion	1. Yes 2. No	
11	Have you screened for HBV and HVC?	1. Yes 2. No	

IV. መጠይቅ

አዲስ አበባ ዩኒቨርስቲ

የህክምና ፋኩልቲ

የላቦራቶሪ ትምህርት ክፍል

ለመረጃ ሰብሳቢዎች፤ጥያቄዉን ከጠየቃችሁ በኋላ መልሱን ከተሰጡት አማራጮች ያክብቡ፡፡

1. መለያ ቁጥር_____መረጃው የተሰበሰበበት ቀን_____

1. የማህበራዊና ስነ-ህዝብ ሁኔታ የሚዳስሱ ጥያቄዎች			
ተ.ቁ	ጥያቄ	መልስ	ምርመራ
1	ጾታ	1. ወንድ 2. ሴት	
2	እድሜ	----------ዓመት	
3	የትምህርት ሁኔታ	1. 1-8 2. 9-12 3. ኮሌጅና ከዛ በላይ	
4	የጋብቻ ሁኔታ	1. ያገባ /ች 3. የፈታ/ች 2. ያላገባ/ች 4 የሞተበት/ባት	
5	የሃላፊነት ደረጃ	1.አባል 2. ሳጅን 3.ኢንስፈክተር 4. >ኮማንደር	
6	ኃይማኖት	1.ሙሲሊም 2.ኦርቶዶክስ 3.ፕሮተስታንት 4.ካቶልክ 5. ለላ----------	
7	የትውልድ አከባቢ	1. ገጠር 2 .ከተማ	
8	ብሔርዎ ምንድ ነው?	1. ኦሮሞ 4. ጉራጌ 2. አማራ 5.ወላይታ 3. ትግሬ 6. ሌላ (ይገለጽ) ---------	
2.የግንዛቤ መጠን መለኪያ ጥያቄ			
1	የጉበት በሽታ ተህዋስያን ቢናሲን ሰምተውት ያዉቃሉ?	1. አወ2. አላውቀውም	
2	ሰምተውት ከሆነ ከየትነው የሰሙት?	1. ከመፃህፍና ከጋዜጦች 2. ከአስተማሪዎች እና ከተለያዩ ስብስባዎች 3. ከሚዲያ 4.ከቤተሰብና ከጓደኞች 5.ከተለያዩ ቦታዎች	
3	የጉበት በሽታ አምጭ ተህዋስያን ቢናሲ የትኛውን የሰውነት ክፍል ያጠቃሉ?	1. ጉበት2. ልብ 3. ኩላሊት 4.ጭንቅላት 5.አላውቀውም	
4	የጉበት በሽታ ተህዋስያን ቢናሲ መተላለፊያ መንገድ	1. ደምና የደም ውጤቶች ሀ. አወ ለ.የለም 2. መርፌና ስለታማ ነገሮች ሀ. አዎ ለ.የለም 3. በግብረ ስጋ ግንኙነት	

		ሀ. አወ ለ.የለም 4. ቀጥታ ከእናት ወደ ልጅ ሀ. አወ ለ. የለም 5. ከተበከለ እጅ ወደ አፍ ሀ. አወ ለ.የለም 6. ከተበከለ ውሀ ሀ. አወለ.የለም	
5	ለጉበት በሽታ ተህዋስያን ቢ ክትባት አለ ብለው ያስባሉ?	ሀ. አወ ለ.የለም	
6	ለጉበት በሽታ ተህዋስያን ቢናሲ የሚዋጡ መድሀኒቶች አለ ብለው ያስባሉ?	ሀ. አወ ለ.የለም	

	3. የአኩዋሓን (Attitude) መጠን መለኪያ ጥያቄ	
1	**የስራ ሁኔታ** የጉበት በሽታ ተህዋስያን ቢናሲ ያጋሊጣል ብለው ያስባሉ?	ሀ.አወ ለ.የለም
2	የጉበት በሽታ ተህዋስያን ቢ. ክትባቱ ውድ ብለው ያስባሉ?	ሀ. አወ ለ.የለም
3	የጉበት በሽታ ተህዋስያን ቢ. ክትባቱ መዉሰድ በሽታን ይከላከላል ብለው ያስባሉ?	ሀ. አወ ለ.የለም
4	ጉበት በሽታ ለሕብረተሰቡ ፈተና ነው ብለው ያስባሉ?	ሀ. አወ ለ.የለም
4.የጉበት በሽታ ቢና ሲ ልምምድ (practice) ሁኔታ መለክያ ጥያቅዎች		
1	በጉበት በሽታ ተይዘው ያውቃሉ?	ሀ. አወ ለ.የለም
2	ከቤተሰበዎ በጉበት በሽታ ተይዞ እሚያውቅ አለ?	ሀ. አወ ለ.የለም
3	ሆስፒታል ውስጥ ታመዉ ተኝተዎ ያቃሉ?	ሀ. አወ ለ.የለም
4	ከአንድ ሰው በላይ የጾታ ግንኙነት አድርገው ያውቃሉ?	ሀ. አወ ለ.የለም
5	ስለታማ ነገር ቆርጦዎት ያውቃል?	ሀ. አወ ለ.የለም
6	ሰውነተዎ ላይ ንቅሳት አለ?	ሀ. አወ ለ.የለም
7	ጥርሰዎን ኣስነቅሎ ያውቃሉ?	ሀ. አወ ለ.የለም
8	ጀሮዎን ተበስተው ያውቃሉ?	ሀ. አወ ለ.የለም
9	የጉበት በሽታ ክትባት ተከትበው ያውቃሉ?	ሀ. አወ ለ.የለም
10	ከሌላ ሰው ደም ተቀብለዎ ያውቃሉ?	ሀ. አወ ለ.የለም
11	የጉበት በሽታ ምርመራ አድርገው ያውቃሉ?	ሀ. አወ ለ.የለም

12. 4 Annexes of principle and procedure of tests

A. HCV test principle

Principle

Ecotest (Hangzhou Co., Ltd. China) HCV Test strip (serum/plasma) detects antibodies to HCV through visual interpretation of color development in the internal strip. Recombination of HCV antigen is immobilized on the test region of the membrane. During testing the specimen reacts with recombinant HCV antigen conjugate to colored particles and precoated onto the sample pad of the test. The mixture then migrates through the membrane by capillary action and interacts with reagents on the membrane. If there are sufficient HCV antibodies in the specimen, a colored band will form at test region of membrane. The presence of a colored band indicates a positive result, while the appearance of colored band at control region serve as a procedural control, indicating that the proper volume of specimens has been added and membrane wicking has occurred.

Test procedure

Allow the device and specimen to equilibrium to room temperature (15 -30 oC) before testing.

1. Remove a testing device from the foil pouch by tearing at the notch and place it on a level surface.

2. Holding a sample dropper vertically, add two drops (approximately 50 ul) of specimen to the sample well then add 1 drop of buffer and start timer.

3. Wait for 10 minute and read results .Do not read results after 20 Minuit

Interpretation of results

Positive (+): Two colored bands appear on the membrane. One band appears in control region (C) another band appears in the test region (T).

Negative (-): Only one colored band appears, in control region (C). No apparent colored band appears in the test region (T).

Invalid: No visible band at all, there is a visible band only in the test region but not in control region. Report with a new test kit. If test still fails, please contact the distributer or the store, where you bought the product with the lot number

Note: The intensity of the red color in the test line region (T) will vary depending on the concentration of anti-HCV antibodies present in the specimen. However, neither the quantitative value nor the rate of increase in anti-HCV antibodies can be determined by this qualitative test.

B. Hepatitis B surface antigen test principle and procedure

Principle

Wondfo (Guangzhou wondfo biotech co., Ltd, china) one step HBsAg serum/plasma Test cassette is a rapid immunochromatographic test for the visual detection of hepatitis B surface antigen (HBsAg) in serum/plasma samples. When the specimen is added in to the test device, the specimen is absorbed in to the device by capillary action, mixes with the antibody conjugate and flows across the pre-coated membrane. When the antigen levels are at or above the detection limit of the test, HBsAg in the sample combines to the antibody conjugated in the pad then are captured by the anti-body immobilized in the Test Region (T) of the device. This produces a visible colored band in the Test Region (T), which indicates a positive result. When the antigen level is zero or below the detection limit of the test, there will be no colored band in the Test Region (T), which indicates a negative result. To serve as a procedure control, a colored line will appear at the control Region(C).

Test procedure

Allow the device and specimen to equilibrium to room temperature (10 -30 oC) prior to testing.

1. Remove a testing device from the foil pouch by tearing at the notch and place it on a level surface.

2. Holding a sample dropper vertically, add four drops (80ul-100ul) of specimen to the sample well.

3. Wait for 15 minute and read results .Do not read results after 30 Minuit.

Interpretation of results

Positive (+): Rose –pink bands are visible both in the control region and the test region. This positive result indicates the concentration of HBsAg is equal to or higher than the detection limit of the test.

Negative (-): A rose-pink band is visible in the control region. No color band appears in the test region. A negative result indicates that HBsAg is zero or below the detection of the test.

Invalid: No visible band at all, there is a visible band only in the test region but not in control region. Report with a new test kit. If test still fails, please contact the distributer or the store, where you bought the product with the lot number.

C. HBsAg ELISA test principle

Murex HBsAg version 3 UK this is a Sandwich Enzyme linked Immune-sorbent assay method in which polystyrene micro well strips are pre-coated with monoclonal antibodies specific to HBsAg. Participant's serum or plasma sample is added to the micro-wells together with a secondary antibody conjugated with horseradish peroxidase (HRP) and directed against a different epitope of HBsAg. During incubation, the specific immune-complex formed in the case of presence of HBsAg in the sample, is captured on the solid phase. After washing to remove sample serum protein and unbound HRP conjugate, chromogen solution containing Tetra-methyl Benzedrine (TMB) and urea peroxidase are added to the walls. In the presence of the antibody-antigen-antibody (HRP) sandwich immunecomplex, the colorless chromogens are hydrolyzed by the bound HPR conjugate a blue colored product. The blue color turns to yellow after stopping the reaction with sulfuric acid. The amount of color can be measured and is proportional to the amount of antigen in the sample (Test kit insert sheet).

D. Anti-HCV ELISA test principle

Woodland Hills, California, 91367, USA. This is Polystyrene micro-well stripes are pre-coated with recombinant, highly immune-reactive antigens corresponding to the core and non-structural regions of HCV. During the first incubation step, anti- HCV specific antibodies, if present, will be bound to the phase pre-coated HCV antigens. The wells are washed to remove unbound serum proteins, and rabbit antihuman IgG antibodies (anti- IgG) conjugated to HRP is added. During the second incubation step, these HRP conjugated antibodies will be bound to any antigen- antibodies complexes previously formed and the unbound HRP-conjugate is then removed by washing. Chromogen solutions containing Tetra-methyl Benzedrine (TMB) and urea peroxidase are added to

the wells and in presence of the antigen antibody- anti-IgG (HRP) immune-complex; the colorless chromogens are hydrolyzed by the bound HRP-conjugated to a blue colored product. The blue color turns to yellow after stopping the reaction with sulfuric acid. The amount of color can be measured and is proportional to the amount of antibody in the sample.

F) Test Procedures for ELISA

1. A micro titration well plate is coated with known antigen.
2. Add patent's serum. If the serum contains antibody it combine with antigen.
3. Wash carefully by using automatic washer more than 5 times.
4. Add enzyme labeled antihuman globulin, which attaches to the antibody.
5. Wash carefully.
6. Add the substrate, which is hydrolyzed (broken down) by the enzyme to give a color change.
7. Read the result.

12.5 Annex of thesis declaration

I, the undersigned, declare that this Master science degree thesis is my original work, has not been presented for a degree in this or any other University and that all sources of materials used for the thesis have been duly acknowledged.

Principal investigator: Tekilu Israel (BSc, MSc candidate)

Signature: _____

Date of submission: _____

Name of Advisors:

1. Mr- Kassu Desta (Bsc, Msc, PhD fellow, Associate professor)

Signature _____Date_____

2. Dr Wondatir Negatu (PhD)

Signature _____Date_____