ASSESMENT OF RISK FACTORS OF HEPATITIS B VIRUS (HBV) INFECTION AMONG ADULTS IN SELECTED SUB COUNTIES IN NGORA DISTRICT

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DECLARATION

I, Masika Doreen, declare that this study titled "assessment of risk factors of Hepatitis B virus infection among adults in selected sub counties of Ngora district" is my original work and has never been submitted to any other university for the award of a degree, or has not been published before for any other purpose.

I also declare that this work was submitted to my supervisor for the examination and approval.

Masika Doreen

(Researcher)

Signature_____ Date_____

APPROVAL

This is to certify that Masika Doreen carried out this research dissertation under my supervision. this dissertation on "Assessment of risk factors of Hepatitis B virus (HBV) infection among adults in selected sub counties in Ngora District" is therefore true record of the research she carried out , I hence approve it for submission and examination

Signature …… Date……

MR. ALLEGE JOHN BOSCO

(Supervisor)

DEDICATION

This research study is dedicated to my family; my spouse Ekaal Robert and children Ashley, Nicole, Nicholas and Nicoleen. I would also like to devote this piece of work to my parents for the struggle they went through to have me nature and groomed.

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I would like to acknowledge the following persons for their various contributions towards my study of assessment of risk factors of Hepatitis B virus infection among adults in selected sub counties of Ngora district"

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OPERATIONAL DEFINITIONS

This Study: In my text this referred to the study that I carried out in selected sub counties in Ngora district (the current study).

Respondent: This is an adult in one of the selected sub counties in Ngora district that had a known HBV status and participated in the study.

HBV infection: A viral infection that is caused by the hepatitis B virus.

LIST OF ACRONYMS AND ABBREVIATIONS

EPI	Expanded Program on Immunization
HB	Hepatitis B
HBsAg	Hepatitis B surface antigen
HBV	Hepatitis B virus
MoH	Ministry of Health
UBOS	Uganda Bureau of Statistics
UGX	Uganda Shilling
WHO	World Health Organization

ABSTRACT

Introduction; Hepatitis B virus (HBV) infection is a global public health challenge. Prevalence of current hepatitis B virus infection in the general population of Uganda is about 10%. Hepatitis B virus infection is one of the infectious diseases that are currently on the rise both in Uganda and the world at large, it is a viral disease caused by hepatitis B virus (HBV). HBV infection is of great public health concern because it's highly infectious and if unattended to infects the liver causing hepatocellular necrosis and inflammation. This infection is specifically highly prevalent in north and eastern Uganda a reason to why this study was carried out in Ngora district which falls in one of these regions. The main objective of this study was to assess risk factors that are associated with HBV infection among adults in selected sub counties in Ngora district, the specific objectives were; to assess the individual, knowledge and health facility factors associated with HBV infection in the study population.

Methodology; This study was conducted using a cross-sectional study design that employed qualitative methods to collect data from 281 adults aged 18-50 years in three selected sub counties of Kobwin, Mukura and Ngora town council of Ngora district. Data was analyzed using SPSS version 20 to determine frequencies and association of independent variables with risk of HBV infection.

Results; The study findings revealed a self-reported HBV infection prevalence of 20.6% and identified four major risk factors that had direct association with HBV infection namely; knowledge that handling body fluids with bear hands can transmit HBV (OR 3.087, p 0.029), vaccination following a negative HBV test (OR 1.018), history of treatment for STI (OR 1.409), and cost of HBV services (OR 9.742 and p, 0.06).

Conclusion; This study therefore assessed that it is majorly knowledge and health facility factors that predispose the adults in Ngora to HBV infection.

Recommendation; The MOH should continue providing sustainable, free HBV screening and vaccination services to all adults alongside awareness campaign in Ngora district. The district health team should carry out Behavior change communication for prevention of HBV infection targeting individuals on issues such as protected sex, reduction of sexual partners and body fluid handling. Further studies should also be done to determine the most affected population in regards to gender, age and occupation; it's of importance to note that biomedical studies about HBV are lacking in Uganda and need to be invested in.

CHAPTER ONE: INTRODUCTION

1.0 Introduction

Hepatitis B is a viral disease caused by hepatitis B virus (HBV), an enveloped DNA virus that infects the liver and causes hepatocellular necrosis and inflammation. HBV infection can progress to acute and chronic disease and may present symptoms or remain asymptomatic. Acute HB is usually a self-limiting disease with a case fatality rate of 0.5 - 1%. On the other hand Chronic hepatitis B (CHB) infection is defined as persistent HBV infection (the presence of detectable Hepatitis B surface antigen (HBsAg) in blood or serum for longer than six months), with or without associated active viral replication and evidence of hepatocellular injury and inflammation (Lozano R. et al 2012).

Hepatitis B virus can be transmitted through the skin, perinatally (mother to child), horizontally (exposure to infected blood), through sexual intercourse and vertical transmission. Although HBsAg has been detected in multiple body fluids, only serum, semen and saliva have been demonstrated to be infectious (Bancroft WH. Et al. 1977). Local practices that potentially cause bleeding and sharing of instruments are a dominant mode of transmission of HBV especially among children in developing countries (Grand JP et al 1992). Early age HBV infection leads to a high carrier rate of up to 90% (WHO, 1989).

Most people do not experience any symptoms during acute infection phase. Common signs and symptoms of HBV infection that last several weeks include; yellowing of skin and eyes, dark urine, extreme fatigue, nausea, vomiting, and abdominal pain. Acute liver failure may result to death (WHO media center 2016)

Following infection with HBV, 87-90% of the victims develop immunity and clear the infection or become chronic (Weinbaun C.M et al 2008). A smaller percentage will develop liver disease or chronic active hepatitis with an increased risk of developing cirrhosis, liver cancer or both (Goldstein S.T et al 2002). Global burden of HBV is reportedly 600,000 HBV-related deaths per Annum and

73% of all liver cancer deaths are attributed to HBV infection (Ott J.J et al., 2010). Hepatitis B vaccination is the most effective measure to prevent HBV infection and its consequences, other effective control and prevention measures may include; increased awareness campaign, case management and post exposure prophylaxis (CDC 2006).

1.1 Background to the Study

According to WHO factsheet (2016), 240 million people are chronically infected with hepatitis B, 686, 000 people die from HB related complications such as liver cirrhosis and cancer of the liver. Sub Saharan and East Asia are most affected regions where 5-10% of adults live with Chronic HB. Other regions with high prevalence include Amazon, southern Asia and Central Europe (>5%). The Middle East and Indian sub continent have a CHB prevalence of about 2-5% while North America and Western Europe have less than 1%.

World Health Assembly in 2010 recognized HBV as a global health problem. WHO followed up the resolution with a strategy to address four axes which include: raising awareness; partnership and resource mobilization; evidence-based policy and data for action; prevention of transmission; and screaming, care and treatment (WHO, 2013).

In the USA, HBV transmission occurs primarily among unvaccinated adults. Risk for HBV include, multiple sex partners, injection drug users and men who have sex with men. Adults account for about 95% of all new HBV infection. This has been attributed to low HBV vaccination among adults which is estimated at 45% associated with low availability of HBV vaccination services for adults (CDC 2006).

A Brazilian study, HBV infection among none vaccinated was found to be 10% while among vaccinated group was 4.3%, HBV vaccination level ranged from 25-35%. Incidence of infection increased with age and ranged from 0.19-0.6% (Leila M. et al 2009). Brazil is known to have intermediate endemicity for HBV. Low prevalence has been attributed to scheduled infancy

vaccination as a national policy then in 2001 expanded to include children and adolescents (Saopaulo Health secretariat, 2006).

In Bangladesh a study conducted in Dhaka by Hasan A et al (2010) with 1997 healthy individuals participated revealed 29% HBV-sero positivity. Risk factors for HBV were documented as being married, treatment for an STI in the past, body piercing, visiting an registered health care provider, needle stick injuries, surgical operation and animal bite.

In Sub-Saharan Africa, the burden of HBV is high. Prevalence of hepatitis B surface antigen (HBsAg) in general population varies geographically with the highest rates (> 8%) recorded in West Africa, (JJ Ott et al, 2012). Co-infection among people living with HIV is estimated to range from 6% to 25% which accelerates fibrosis, development of hepatocellular carcinoma and increase risk of liver related mortality compared to HIV-negative population (Mathews PC et al., 2014). A recent study by Lozano R. et al., (2012) shows an upward trend of hepatocellar carcinoma and liver cirrhosis in sub-Saharan Africa.

Numerous risk factors are known to accelerate prevalence of HBV in this region. However, the emphasis on these risk factors varies greatly from one country to another (Gasim et al., 2013). Heterogeneity in religion, culture and practices, and high HIV burden in sub-Saharan Africa are factors that might influence the epidemiology of HBV (Gasim *et al.,* 2013).

The Eastern region of Africa is characterized by being one of the most politically unstable areas, where conflicts tend not to cease. HBV prevalence among pregnant women in the region mimics the epidemiology among the general population, and most countries fall in the moderate endemic zone apart from Somalia, where a high prevalence (37%) was reported in 1987(Sinha & Kumar; M Mavenyengwa et al.,2010).

The public health burden of HBV infection in Uganda is not well understood. However, HBV infection is widespread in the country with a national prevalence estimate of 10%, (Ochola et al.; 2013). The in-country distribution of the virus however varies from region to region. The highest prevalence is found in the Northern part of the country ranging from 5% in South West to 25% in the North East (Bwogi, 2009). A recent study in Northern Uganda estimated an overall life time exposure to HBV infection at 72.4% (Ochola et al 213).

Ngora District is one of the 11 districts with high HBV prevalence countrywide. Others include Gulu, Kitgum, Lira, Arua, Adjumani, Yumbe, Moyo, Kasese, Bukedea and Amuria. Most have been affected by decades of LRA conflict that left health system in the region affected. It is feared to degenerate into an epidemic. Hepatitis B morbidity and mortality are a significant burden and so understanding of the epidemiologic risk factors associated with HBV infection among populations is crucial. The epidemiology of viral hepatitis is important for health planners and program managers (Gasim et al., 2013).

Several interventions have been carried out in the effort to control HBV infection in Uganda. Such includes scheduled infant immunization. HBV vaccine was introduced in Uganda in 2002 as part of the Expanded Programme on Immunization (EPI) and is given at 6, 10 and 14 weeks of age (WHO, 2007). However vaccination among adult population is low. In North eastern region adult screening and vaccination program has been running since 2014. Abdhala K. et al (2010) found out that only 6.2% were vaccinated. Understanding of risk factors for HBV infection is required in order to come up with effective policies and interventions that will contribute to the reduction of HBV prevalence in Ngora, Northern region and Uganda at large.

1.2. Statement of the Problem

Recent studies indicate a high prevalence of HBV infection (20-25%) in North Eastern region of Uganda where Ngora district is located. This is above national average of 10% and five times higher than that of South Western Uganda (4-5%) MOH, (2015). According to Ngora district health reports,

prevalence of HBV remains at 21% and the attributable HBV-related disease burden is expected to remain high as reflected by a high mortality rate from primary liver cirrhosis and cancer of the liver in the region.

Since the magnitude of HBV disease in Uganda came to the limelight following a 2005 HIV Sero Indicator survey in which samples were tested for HBV, various measures and guidelines have been set by Uganda's MOH and WHO on how to control HBV transmission. These includes; health promotion on HBV control, vaccination of health workers between 2012 & 2014, free mass vaccination of general population, early diagnosis and treatment of HBV and a surveillance system for HBV. The above interventions have been carried out in Ngora district yet a decline in HBV infection has not been registered.

Persistently high hepatitis B infection prevalence in Ngora district poses various challenges on the health care system and the population at large, these include; increasing number of new born babies with hepatitis B, increasing cases of liver cirrhosis and cancer of the liver, high co-infection with HIV/AIDS and a high burden on health sector budget. On the other hand, limited studies have been done in Ngora to highlight the increased prevalence hence the relevancy of this study. This demands further behavioral studies to guide evidence based HBV control policy, programs and projects in Ngora district and North eastern region at large. Therefore this study aims to contribute to the understanding of knowledge, individual, and health facility factors that could be influencing high prevalence of HBV in Ngora district.

1.3. General Objective of the Study

To assess risk factors associated with Hepatitis B Virus (HBV) infection among adults aged 18-50 years in selected sub counties of Ngora District.

1.4. Specific Objectives of the Study

Specifically, the study intends to achieve the following objectives;

i. To determine individual factors associated with HBV infection among adults aged 18-50 years in selected sub counties of Ngora District.
ii. To assess knowledge factors associated with HBV infection among adults aged 18-50 years in selected sub counties of Ngora District.
iii. To assess health facility factors associated with HBV infection among adults aged 18-50 years in selected sub counties of Ngora District.

1.5. Research Questions

i. What are the individual factors associated with HBV infection among adults aged 18-50 years in selected sub counties of Ngora district?
ii. Which knowledge factors contribute to HBV infection among adults aged 18-50 years in selected sub counties of Ngora district?
iii. What health facility factors are associated to HBV infection among adults aged 18-50 years in selected sub counties of Ngora district?

1.6. Significance of the Study

The current prevalence of HBV in Ngora, Uganda and the world at large presents an increasingly big public health challenge yet majority of the HBV causes are preventable.

It's hoped that findings from this study will adequately inform policy and have the potential to benefit the periodic policy reviews that will help check the spread of HBV infections among the people of Ngora and Uganda as a country. The results will further inform policy makers on the most effective regulatory strategies that can further minimize the escalating spread of HBV infection among the people of Ngora and the north eastern region of Uganda.

It's also hoped that findings from this study will inform behavior change of adults in Ngora district through community sensitization campaigns. Hence alerting them to be more conscious and sensitive

about having unprotected sex, multiple casual sex partners, body fluid handling, and routine HBV screening in a bid to curb the spread of HBV.

Findings from this study are hoped to richly contribute to the level of HBV infection awareness among the people of Ngora and this will greatly influence the rate at which HBV infection is being spread given that people will now know what to do to prevent it. The study will also further unquestionably help in improving health service delivery in the aspects of screening, vaccination and treatment of HBV infections. This will greatly influence the rate at which HBV infection is spreading out.

In a nut shell, this study will bridge the knowledge gap on the risk factors associated with increased HBV infection and will also be used as a mini evaluation of the progress of hepatitis B vaccination and sensitization program campaign launched in Ngora district in July 2016.

1.7. Conceptual Framework

Figure 1: Conceptual Framework for the Analysis of Epidemiological Risk Factors of HBV infection in Ngora District.

Narrative of Conceptual framework

The Conceptual framework outlines several individual attributes, knowledge, and health service factors. These are some of the factors thought to contribute to the high risk of Hepatitis B virus infection among adults aged 18-50 years in selected sub counties of Ngora district. The individual attributes include; body scaring and piercing, sharing of needles & razor blades, vaccination service seeking, completion of HBV treatment, sexual practices, underlying chronic disease, knowledge of HBV status and history of STI knowledge can contribute to one's risk to HBV infection. The different indicators on level of Knowledge on HBV include; Knowledge on HBV transmission, prevention and services, these are equally thought to be influencing risk of HBV infection. Health facility factors such as distance to health facility, availability of trained health workers, availability of HBV screaming services, vaccination services, access to screening services, cost of screening services and treatment may also determine level of HBV transmission risk.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This chapter reviews available literature on HBV. It has been categorized into 3 sections namely; knowledge factors, individual factors and health factors and discussed in that order.

2.1. Individual factors and HBV Infection

The prevalence of lifetime HBV was significantly associated with age, education, history of blood transfusion, occupation, wealth, marital status, religion, ethnicity, residence (urban/rural), region of residence, and number of lifetime sex partners. Studies found that HBV infection occurs more frequently in rural areas and risk rises with poverty and lack of education, as do other forms of ill health, (Bwogi1 et al, 2009, Ssewanyana et al, 2004 & Uganda Bureau of Statistics; UBOS, 2001). Surprisingly studies done by (Murad et al, 2013) and (Mansour et al., 2012), showed no significant association between social demographic factors of age, education level, and HBV.

However, some reports have stated that becoming sexually active at an early age is a risk factor, this was highlighted in a study done by (Rabiu et al, 2010) among Nigerian pregnant women attending ante natal care in selected health facilities in Lagos. It highlighted that mothers who had had their first sex debut before the age of 15 years were more at risk of HBV infection as compared to their counterparts who had their first sex debut much later in life.

On age again, (Hyams, 2005) in his study on risk of chronicity after HBV infection, reported that the likelihood of progression to chronic infection is inversely related to age at the time of infection. He said that around 90% of infants infected with HBV perinatally become chronic carriers, unless vaccinated at birth. That study presented that risk for chronic HBV infection decreases to 30% among children infected between ages 1 and 4 years and to less than 5% of persons infected as adults, this was also in agreement with (McMahon et al., 2012).

Socio-demographic factors in HBV transmission have shown great variation among studies depending on the specific factor, some researchers have found that increasing age is a risk factor, which might be explained by the cumulative effect phenomena, probably attributed to the use of unsterile injections and other instruments used in traditional scarification and tattooing (Abdul Q. et al., 2010); (Shepard et al., 2005) yet others find totally no relationship at all.

Study findings from Iran (Alavian S.M., et al 2007) in a cross sectional study among 1500 subjects who attended a sexually transmitted disease laboratory found a Sero-prevalence of HBsAg of 10% among women and 14.2% among men. These findings indicated that men are more at risk of HBV as compared to women, (Sayed M., et al., 2012), using random cluster sampling found similar result depicting association between risk of HBV and gender. Similar findings were reported in Nigeria (Olokoba, A.B., 2011) in a study among women aged 17-44 years attending antenatal care and a comparison group of men of the same age attending the clinic for other medical reasons. The study found that with average prevalence of 8.2%, risk of HBV steadily rose and peaked among age group 25-29 years at 39.8% of the men as compared to 20.4% among the women. Incidentally this is a sexually active age group and highly reproductive. Finding attributed high risk to unprotected sex and multiple sexual partners at this age group.

A population based study conducted in Iran using random cluster sampling method and targeting population aged 6-64 years, (Sayed M., et al.,2012) found that age and marital status were predictors of HBV. Being married was a protective factor to HBV infection, similar findings were recorded in china (Juan J., et al 2006) in a study among 112 MSM, and findings were that MSM participants who had divorce had higher chance of contracting sexually transmitted diseases including HBV. The study attributed findings to unprotected sex and increased number of sexual partners following divorce.

Educational level is another individual factor of concern and studies have found that women who have received less than secondary school level education are at higher risk of acquiring HBV infection as compared to their counterparts (Murad et al., 2013). HBsAg positivity is reported to decrease with

increase in education level (Pennap, Osanga & Ubam, 2011; Buseri, Seiyaboh & Jeremiah, 2010). Higher education attainment has a strong association with HBV infection awareness and immunization uptake and this indicates that access to HBV health education is limited to higher education institutions (Noreen et al., 2015; Bassey, 2009).

In the study of sero prevalence of human immunodeficiency virus, hepatitis b, hepatitis c, syphilis, and co-infections among antenatal women in a tertiary institution in South East, Nigeria, it was found that higher positivity (5.5%) was detected among unemployed pregnant women. This indicated that unemployed pregnant women formed bulk of positive cases (Ikeako, Ezegwui, Ajah, Dim and Okeke 2014). This may be explained by the low economic status initiating women to multiple sexual partnerships and unprotected sex thus making them vulnerable to STIs (Bayo, Ochola, Oleo, Mwaka, 2014). Tattoos are widespread practices in Africa, and have been linked to HBV transmission by some researchers (Olokoba et al., 2011). This is as a result of sharing tattoo equipment that are rarely sterilized in between clients.

However these findings are in disagreement with studies in Nigeria which found that maternal, age, education level of education and employment to have no significant association with level of HBV.

Regarding Sex, Some studies have found a significant relationship between sex and risk of HBV infection. (Mohammadi M.et al., 2009) in a study conducted among HIV positive patients in Iran, found higher proportions of HBV among women compared to men (51.5% 11.2%) respectively, HBV/HCV co-infection in HIV positive women was higher than that of men (21.2% and 6.7%) respectively.

Screening, completing vaccination and treatment for HBV is part of prevention and control strategies for HBV. Studies in Nigeria found that HBsAg-positive mothers who received hepatitis B immunoglobulin reduced chances of transmission to their new born to 23%. A combination of HBIG and Hepatitis vaccination reduced transmission to 3 % (Rumi, MA., et al., 1998). Treatment with lamivudine has been found to reduce HBV-DNA level by 97% in only two weeks in the effort to

reduce vertical transmission (Bohinda, N.B 2004,) Despite such opportunities of prevention, low level of screening, completion of vaccination and treatment have been found among general population and health workers (Gregory T. et al 2007, Ferira R.C. et al 2009). Lack of vaccination has at times been attributed to limited access due to uncoordinated government initiatives and a result there are disparities in level of vaccination among population even within health workers. A study in Mulago (Ziraba, A.K. et al ., 2010) found that while 36% of professional health workers were immunized only 3.5% of the house keeping staff in the same hospital were immunized.

Sexual transmission of HBV accounts for 50% of HBV infections. Increased number of sexual partners, unprotected sex and casual sex with people of unknown HBV status increases chance of one contracting the virus. In a Cross sectional study done in Brazil among none injectable drug users findings showed a high prevalence (14%) of HBV infection with independent predicators of risk of HBV infection being age>30 years, duration of drug use, life time sexual partners of >10 and none use of condoms (Fereira, R.C., et al 2009). Similar findings linking sexual practices to HBV have been reported in a cross sectional study conducted in northern Uganda (Bwogi et al., 2009). Higher prevalence's were found among uncircumcised men and adults with high number of sexual partners.

Body scaring and piercing especially using unsterile equipment has been found to transmit HBV. A study in Iran among 226 gypsies found that tattooing and phlebotomy, both forms of body piercing were associated with risk of HBV (Alavian, S.M et al 2007). In addition to that study a cross-sectional study conducted in Nigeria, (Eke, et al., 20011) found a significant association between risk of HBV and previous history of tribal markings/tattoos (P=0.001) and previous contact with infected HBV patients (P-0.001). The study attributed the findings to sharing of unsterilized tools during this process.

In Uganda, body piercing exists among most communities. The purpose of markings range from body decoration, age related initiation and for ritual purposes. Such practices are common in North Eastern region among karimajong, itesot and Acholi. A Uganda National Survey conducted by Bwogi et al

(2009) found that Karimojongs were up to 8 times more likely to test HBV positive compared to Baganda OR 8.3 (CI 95% 4.0-17.1). Cultural practices such as body piercing were attributable factors.

Other studies have also shown that none compliance with hygiene standards in hospitals were behind high prevalence of HBV among health workers. Despite high knowledge on HBV, doctors, clinicians and nurses did not comply with standard hygiene practice including use of sterile equipment and material hence high HBV infection. For example, Needle stick injuries and reuse of syringes have been found to be significantly associated with HBV acquired from hospital environment (Guresh, H., et al., 2010)

A cohort study in Libya comparing 300 medical waste handlers and 300 other adults who had no direct contact with medical waste (Franka, E., et al., 2009) confirmed that the relationship between exposure to needle stick. The study found that medical waste handlers were seven times more likely to acquire HBV (OR: 7.14; $P<0.04$) when compared to those who have never been directly exposed to medical waste. Findings were attributable to exposure to needle stick injuries and body fluids.

Blood transfusion has been found to be associated with HBV infection even though blood screening for HBV, is part of the WHO blood safety. Some of the safe blood strategies include setting national policies for transfusion, recruitment of voluntary and unpaid blood donors, proper screening of collected blood and policies on rational use. Compromising safety procedures is still very common in Africa and this greatly risks the recipients HBV blood status after a blood transfusion has been done. A study in Tanzania among HIV Sero-positive adults found blood recipients were more likely to test positive for HBV and that family member donor recipients were highly at risk.

However, (Eke et al., 2011) in a cross sectional study of HIV positive mothers found no significant association between blood transfusion and HBV infection. While the target population was similar, the difference could be the level of compliance with blood transfusion standards.

2.2. Knowledge factors

There is high prevalence of HBV infection among blacks (Adekanle et al., 2010) and good knowledge of HBV virus means and modes of infection as well as adequate vaccination may reduce infection rate. The knowledge of HBV is generally low among the populace as deduced from a study done by (Vander Veen et al., 2010). The public health burden of HBV infection in Uganda is unknown, although the country has long been considered to be among the highly HBV endemic countries of sub-Saharan Africa, with more than 8% of the population expected to harbor chronic infection (WHO, 2007).

Results from Ugandan studies support this expression that the prevalence of HBV surface antigen (HBsAg), a marker of chronic HBV infection, ranged from 6 to 15% among blood donors when HBV screening was introduced in selected populations in Uganda (Watson & Kataaha, 2006; De Lalla et al. & Goodgame, 1990). The current state of affairs is attributable to inadequate awareness and knowledge of HBV transmission and prevention in the general population, resulting in a low rate of uptake of HBV vaccination by the lay public (Lao et al., 2010).

Knowledge of region- and age-specific prevalence of hepatitis B infection is important for evaluating vaccination programs and national disease prevention and control efforts (Ott, Stevens, Groeger & Wiersma, 2012). Assessing peoples' knowledge is a useful step to assess the extent to which an individual or community is in position to adopt a disease risk-free behavior for this disease (El-Nasser and El Baset, 2013). HBV awareness, access to screening, vaccination and treatment has remained poor in resource limited countries due to poverty, illiteracy and lack of political will. Unawareness of ongoing infection delays diagnosis of HBV related liver disease and favors the spread of the virus. In studies carried out to assess HBV awareness among pregnant women in Hong Kong (Chan, Lao, Suen & Leung, 2012), Cameroon (Frambo et al., 2014) and Nigeria (Bassey, 2009), it was noted 70-80% of respondents had poor knowledge and not aware of the infection.

Health care related transmissions have long been recognized as a source of HBV infection. Transmission of infection from patients to health care providers was common before widespread HBV vaccination of health care workers (Shepard et al., 2006). Knowledge regarding HBV and safety precautions is needed to minimize acquiring infections especially the importance of vaccinations and practice of simple hygienic measures apart from that of specific protective measures (Samir, Saleh & Shabila, 2013). HBV is spread predominantly by percutaneous or mucosal exposure to infected blood and other body fluids with numerous forms of human transmission. The sequence of HBV infection include acute and chronic infection, cirrhosis of the liver and primary liver cancer (Ott, Stevens, Groeger & Wiersma, 2012).

HBV is transmitted by exposure to infected blood or other body fluids (Saleh et al., 2010). The highest concentrations of infectious HBV are found in blood and serum (Saleh et al., 2010), however, other serum-derived body fluids, such as semen and saliva are also infectious. Studies have shown that blood and its products followed by infected needles as the most important route of transmission of HBV (Raza et al., 2008; Samuel et al., 2009). Transmission from a chronically infected woman to her infant during delivery is efficient and is one of the most common routes of HBV infection worldwide. Perinatal transmission of HBV most often occurs during the birth process (Francis, et al. 1985; Wong, et al., 1984). In most of the endemic areas, HBV infection is mainly acquired during birth and early childhood and vertical transmission accounts for more than 50% of the chronic infection cases (Wong et al., 1984). Around 90% of babies born to mothers who are hepatitis B surface antigen carriers will become chronic carriers if no immune prophylaxis is given to them as vaccination and treatment to prevent the disease from spreading (Beasley et al., 1983). Vertical transmission from mothers to infants is definite in HBV infection. Studies on viral parameters show that vertical transmission is seen among HBV infected pregnant mothers (Ogunro et al., 2007; Caudai et al., 2003). Transmission of HBV can also occur in situations where there is frequent and prolonged close personal contact with an infected person (Davis et al., 1989).

The virus is transmitted by parenteral (drug administration other than by the mouth or the rectum, e.g. by injection, infusion, or implantation) or mucosal exposure to HBsAg-positive body fluids from persons who have acute or chronic HBV infection. The highest concentrations of virus are in blood and serous fluids; lower titers (substance concentration) are found in other fluids such as saliva, tears, urine and semen. Semen is a vehicle for sexual transmission and saliva can be a vehicle of transmission through bites and other types of exposure e.g. through kissing. However, lack of knowledge and awareness about HBV and liver cancer in the community is a major barrier to preventing HBV related morbidity and mortality in the population (Taylor et al., & Chen et al., 2006). In addition, the absolute number of individuals being chronically infected with HBV is not known. In the light of this gap, this study is to examine the knowledge of HBV transmission among the communities in Ngora District.

The status of HBV in African countries is a persistent issue for all sectors involved in public health, in particular, those that are involved in health strategic planning. Prevention concerns of the prevalence of HBV and other problematic issues should be taken into consideration. Prevention strategies have to target reduced transmission of HBV particularly among high-risk groups (WHO, 2012). Risk-reduction counseling and HBV screening programs should be directed at specific populations, as suggested by the (Centers for Disease Control, 2013) in the United States. Universal and specific infection control measures that are directed towards nosocomial infection and units or persons in hospitals and health-care centers that are rendered prone to HBV infection are necessary. Specific prevention programs should be implemented by adopting better and more efficient cleansing and standard sterilization practices to stop nosocomial and iatrogenic transmission of HBV. Risky patient care practices associated with higher HBV prevalence should be identified, and recommendations and appropriate precautions in these settings adopted.

Because chronic HBV infection is usually asymptomatic until advanced liver disease has developed

(Wright, 2006), HBV screening is necessary in order to identify both individuals who are infected and those who remain susceptible to infection. In the high-risk community, preventive action against HBV and liver cancer must be undertaken at three levels of; serological testing of HBV infection and antibody status, vaccination of unprotected children and adults, and routine liver cancer screening in patients chronically infected with HBV. Advanced laboratory screening methods for blood and blood products should be central to further reduce transfusion-related transmissions. Once patients are discovered to have hepatitis B, they require counseling and proper clinical evaluation to eliminate the risk of transmission and halt the progression of the disease.

Health initiatives should be implemented in communities to reduce the burden of chronic HBV infection and eliminate the racial/ethnic disparity in liver cancer incidence and mortality. In order to spotlight the need for such interventions, as well as to inform their design and identify key target groups for education and intervention (Wu et al., 2007). Several studies have highlighted the importance of the control of viral hepatitis through health education, hepatitis B vaccination of at risk population, and treatment of infected persons (Bakry et al., 2012 & Mihigo et al., 2013).

Effective dissemination of HBV and liver cancer information is needed to dispel current misinformation existing in communities. One essential topic for education is the difference between HBV and hepatitis A virus, which, unlike HBV, can be transmitted through food and water, but does not cause chronic infection and very seldom leads to death (WHO, 2000). In addition, educational efforts should correct the misconception that people with chronic HBV infection often exhibit overt symptoms, since such a belief could deter people who feel healthy from taking preventive action. This false sense of security could be compounded by the widespread, but erroneous, belief that a cure for hepatitis B exists (Wu et al., 2007).

Reported levels of HBV preventive action, especially vaccination, were low in Uganda as Government earmarked $11m (about sh2.7b) to conduct immediate massive vaccination in 11 districts with the highest prevalence rate of Hepatitis B as legislators caution that inability to conduct

countrywide vaccination might see the disease degenerate into an epidemic (Walubiri & Musoke,2016). According to Minister of State for Health, Sarah Opendi, government is financially constrained to rollout the vaccination program which will be countrywide as the Centre for Disease Control warns of the incipient dangers of ignoring the disease. In Uganda, government offers free countrywide vaccination for children under five and people undergoing blood transfusion in government hospitals. However, some category of people continues to infect others unknowingly either through unsafe sex, unsafe blood transfusion or sharing sharp objects (Walubiri & Musoke, 2016).

A study conducted in Canada, among Chinese migrants, (Gregory T. et al 20017). Majority of respondents (80%) new that HBV can be spread by asymptomatic persons and can cause cancer of the liver and cirrhosis. Another study in Netherlands among Turkish community (Van der veen YJ. et al., 2010) found low awareness on HBV among adults. Majority of the respondents (73%) never thought about the disease and 58% scored less than 5 out 10 on knowledge items. Consequently only a self reported test rate was only 15% among the same population. Knowledge of a disease influences people's behavior towards prevention and uptake of services linked that problem. High level of awareness is key to control of HBV due to its potential chronicity among seemingly healthy individual.

Basic precautions are critical in the prevention of highly infectious diseases such as HBV. Studies have found that use of sterile equipment, completing immunization against HBV, use of water prove protective while handling body fluids reduces risk of HBV infection. For instance Fraka, E., et al., 2009) attributed high risk of HBV among medical waste handlers in Libya to low level of immunization against HBV (21%) lack of compliance to use of thick disposable gloves (57.7%), boots (55%) and masks (17.7%) and lack of training (7%).

Some studies have also revealed incomplete and inadequate knowledge on prevention on HBV. Findings in Pakistan for instance (Kamel. E., 2008) agrees, on that study among barbers Kamal and

others found that while 96.2% of respondents washed razors with antiseptic and 95.7% used a new blade, knowledge on modes of HBV transmission was poor. Only a third (36.6%) new that HBV can be transmitted through shaving instruments.

2.3 Health facility factors

Studies have shown the influence of health care system on the prevalence of HBV. Risk of HBV is high among poor nations in Sub-Saharan Africa whose health infrastructure is under resourced or undeveloped due to conflicts and ineffective health policies (WHO 2000).

In china a study found high prevalence of HBV (9.1%) among (men having sex with men) MSM, this population segment is highly stigmatized and has low access to health services (Jiang J et al 2006) hence their poor health seeking behavior. The same population had high prevalence of other STI such as syphilis, gonorrhea and Chlamydia, an Indication that their access to STI clinic was low given that this is an outlawed society in China.

In Uganda, a study on HBV (Bwogi et al, 2009) has found high prevalence in the Northern region where LRA conflict had affected that population for over 23 years. Health system strictures had collapsed for long, rendering access to preventive health programs very poor. In comparison to central region, HBV prevalence in Northeastern was 3 times higher OR 3.5(95% CI 1.5-8.1).

Migrants with low access to health care have previously exhibited higher prevalence of HBV infection and low awareness on prevention and availability of HBV services. In a study in Netherlands, Turkish migrants were found to have low knowledge on hepatitis and low self reported test rates. Majority 58% of the respondents scored less that 5 out of 10 on knowledge items and only 15% had tested for HBV (Van der veen YJ. et al., 2010).

CHAPTER THREE: METHODOLOGY

3.0. Introduction

This chapter describes the methods that were used for data collection for the study. It discusses the study design, sources of data, study population, sample size calculation, sampling procedures, exclusion & inclusion criteria, study variables, data collection techniques and instruments, ethical issues, data analysis processes and dissemination of findings.

3.1 Study scope

The study was conducted in three out of the five sub-counties of Ngora district. The focus of the study was on risk factors of HBV infection among adults aged 18-50 years.

3.2 Study Design

The study was conducted using a cross-sectional study design that employed majorly quantitative data collection techniques. This kind of design was appropriate because it enabled the researcher to collect all data at a point in time without the need for follow up.

3.3. Sources of Data

Primary data was collected from adults aged 18-50 years through individual, researcher administered questionnaire interviews.

3.4 Study area

Ngora district is located in North Eastern region of Uganda and part of Teso sub-region. It boarder Soroti district to the northeast, Serere district to the west, Pallisa district to the south, Katakwi district to the northwest and Kumi district to the east with geographical place coordinates of 01 30N, 33 48E. It has 5 sub-counties namely; Kapir, Kobwin, Mukura, Ngora and Ngora Town Council. According to preliminary national housing population census survey of 2014, the district has a population of 142,

387 people of which about 50% are children below 15 years. There are six health facilities offering hepatitis B related services.

3.5. Study Population

The study population was adults aged 18-50 years from randomly selected households and parishes in Ngora district who had previously been tested for HBV. This population was preferred by the researcher because it's both sexually active and of reproductive age and studies show that more than 50% of HBV infections is sexually transmitted (Judison F. 1991).

3.6.0 Inclusion and exclusion criteria

3.6.1 Inclusion criteria

All people aged 18-50 years in Ngora district who had been previously tested for HBV and were present at the time of the study.

3.6.2 Exclusion criteria

Selected people who meet inclusion criteria but due to circumstances such as sickness, inability to talk, mental illness or none availability at the time of interview were excluded from the study.

3.7. Sample Size Calculation

The sample size was calculated basing on Kish and Leslie formula (1965) for sample size determination to justify the sample selection for the study. Kish (1965) says that 30 to 200 elements are sufficient in the sample for a survey research. The commonest aim of survey research is to obtain data from a sample that is representative of a population and for this information collected to be generalizable to the entire population after analysis (Krzyszt et al., 2013).

The formula is;

$n = z^2pq/d^2$

Where n = Desired sample size

Z = Z score corresponding to 95% confidence interval 1.96

p = Proportion of HBV infection prevalence among adults aged 18-50 years in Teso sub-region which is 0.21 (21%), (Ngora district health report 2015)

q =1-p which is (1-0.21) = 0.79

d =margin of error at 95% level of significance, which is 0.5

Substituting in the formula above

$n=1.96^2 * 0.21* (1-0.21)/ 0.05^2$

n=3.8416*0.21*0.79/0.0025

n=254.93

The desired sample size was 281 people aged 18-50 years.

3.8. Study unit

The study unit was an adult aged 18-50 years from a randomly selected house hold in Ngora district with a known HBV status.

3.9. Sampling Procedure

Mixed sampling which included multistage random, systematic and purposive sampling methods were used. The first stage involved selecting sub counties in the district. A second stage was carried out to select parishes while the third selected villages and finally households. This method eliminated selection bias and maximized chances of geographical and demographic inclusion of all members under study.

Selection of a sub-county, parish and villages

Ngora town council was purposively selected to allow inclusion of urban dwellers. The two other counties, Mukura and Kobwin were selected using lottery sampling method where winning slots 1 and 4 were written on 2 of the 4 small papers that were folded and thrown in a tin. Nothing was written on the other 2 papers. The tin was closed and shaken thoroughly. Four research assistants, each representing one of the 4 sub-counties then picked one piece of paper. Mukura and Kobwin emerged winners as research assistants representing them picked winning slots. The same process was used to select parishes and villages. However Number of parishes and villages participating from each county were determined proportionately to the population they have.

Selection of households/participant

Systematic sampling method was used to determine the house hold from which a participant would be identified. A standard K^{th} No. "5" was used to avoid confusion among data collectors, this was after numbers 1-10 were written on individual small papers and one paper picked from a jar, this paper had the number 5. Upon determining a random household, a single member of the household aged between 18-50 years was chosen to be interviewed. From the first household, the 5^{th} house to the east of the first household was selected as a participating household; this pattern was followed throughout the exercise.

3.10. Study Variables

3.10.1 Dependent variable

HBV infection status; this was determined by self-reporting of HBV infection status as diagnosed in the past 12 months and/or availability of patient records.

3.10.2 Independent variables

The following independent variables were measured to determine the factors contributing to the risk of HBV.

1. Individual factors of adults aged 18-50 years; Sexual practices, Body pricking practices, Sharing of needles & razor blades, Knowledge of HB status, Vaccination status, Seeking & completion of HB treatment and underlying chronic disease
2. Knowledge on HBV infection ; HBV Transmission, HBV Prevention, HBV Services and Source of information
3. Health facility factors of adults aged 18-50 years; Distance to health facility, Availability of trained health workers, Availability of HBV screening services, Vaccination services, Access to screening services, and Cost of screening services.

3.11. Data Collection Tools

Quantitative tools

A Semi-structured researcher administered questionnaire with both open and closed ended questions was used to collect quantitative data from sampled adults aged 18-50 years.

3.12 Description of the tools

Questionnaire

A researcher administered questionnaire with structured and semi-structured questions was used. A research assistant introduced the topic of study and read a consent form which was signed by the participant on agreeing to participate. The interview proceeded if a participant agreed and terminated if he/she declines. Questions were posed in English and translated into Ateso for those with difficulty in comprehending English language. The researchers then recorded answers in the provided space. A participant was allowed to skip questions he/she is not comfortable with. On completion of the interview, the researcher/ research assistant gave a vote of thanks to the participant and proceeded to the next house hold.

3.13. Quality Control

The quality of data was assured by the following measures;

3.13.1 Recruitment and training of research assistant

Research assistants were required to be residents of selected parishes, have medical background and be fluent in Ateso language as a precondition for recruitment. This was followed by training on HBV, research tools and on how to conduct interviews.

3.13.2 Pretesting of data collection tools

In-depth questionnaires were pretested on 24 adults aged 18-50 years from Kapir sub-county, note that this sub county did not participate in the final study, but possessed characteristics close or similar to those of the sampled sub counties. Mark, (1995) recommends that, before a survey instrument is used to collect meaningful data, it has to be pre-tested to ensure its accuracy. The pre-test was done to streamline any inconsistencies that would have arisen in structuring questions. It also ensured language clarity and detection of any repetitions so as to increase on ability of the instrument to tap the required information. Pre-test results helped the researcher to make a few modifications to the study instruments where necessary

3.13.3 Editing of data

Editing of data and corrections was made at the end of each data collection day to rule out any missing data. Data entry and cleaning was done using Epi-data version 3.1

3.13.4 Plan for data analysis

Explorative analysis was done on all variables to detect any missing data and data inconsistency. Descriptive analysis was done on all variables to determine their proportions and on all continuous data variables to determine their means and their standard deviations (SD). An HBV infection positive respondent was defined as having been diagnosed with HBV infection in the last twelve months by patient recall and/or availability of diagnosis report.

The relationship between independent and dependant variables were assessed using X^2. Significance was ruled on basis of p values of <0.05. All significant variables and those with potential confounders were considered for multivariate analysis using the Odds Ratio test, note that the statistical analysis was done using SPSS version 20 and presented in tables and figures.

3.14. Ethical Issues

To ensure ethical issues are observed, the study was presented and approved by International Health Sciences University. The researcher obtained an approval letter from Public Health of International Health Sciences University. An introduction letter allowing the researcher to gain access to the district officials and sample population was provided. An Informed consent from respondents before engaging them was sought. The study objective were then clearly read and explained to subjects before administering study instruments. Each respondent was assured of confidentiality of information provided as the study was purely of academic purpose. The researcher ensured that respondents' views and beliefs were respected.

3.15. Limitation of the study

Even though the findings of this study are very representative of Ngora district and the north eastern region Uganda, they may not be generalizable to the rest of the country since they were done in one district only.

3.16. Plan for Dissemination of results

A report of the findings will be submitted to International Health Sciences University (IHSU) in partial fulfillment of a master's degree of science in Public health. A workshop will be conducted at Ngora District Health Office involving HBV control stake holders. Copies will be submitted to department of public health at Ngora District Health Office for consideration of the recommendations. The study will also be published with the consent of the university.

CHAPTER FOUR: STUDY FINDINGS

4.0 Introduction.

This study was conducted in selected households in Ngora district between the months of September and October. A total of 281 adults aged between 18-50 years with known HBV status were interviewed following a voluntary consent and the response level was 100%.

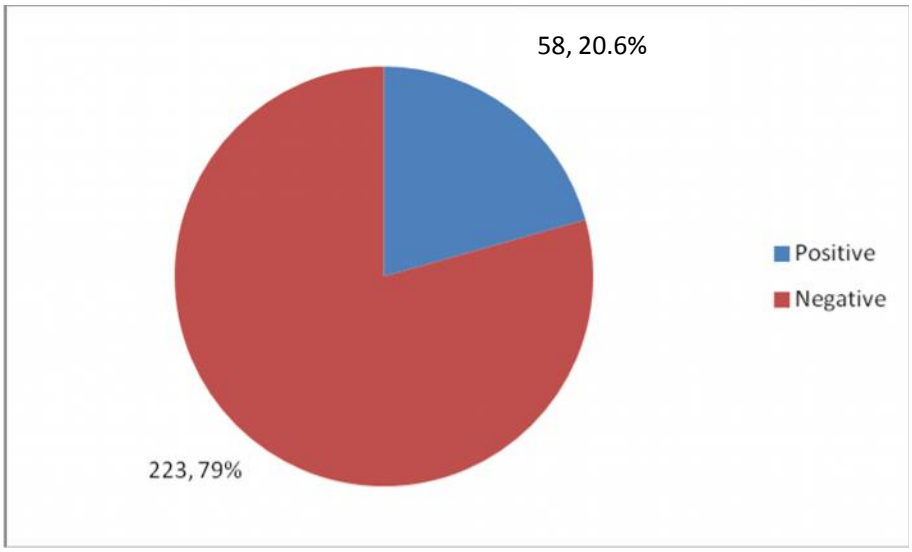
The chapter is presented in 3 main sections. The first section presents data on univariate analysis of demographic data, knowledge factors, individual factors and health facility factors influencing risk of HBV in Ngora district. The second section presents bivariate analysis of the mentioned factors using Chi square and the third section presents findings on multivariate analysis of various selected independent variables that had significant relationship with risk of HBV at bivariate level using logistic regression.

4.1 Univariate analysis

4.1.1 Level of risk of HBV among study respondents

As presented in figure 1 below, the study found a self-reported HBV prevalence of 20.6% among the respondents.

Figure 2: Showing proportion of respondents who reported positive HBV test.



4.1.2 Socio-demographic characteristics of study respondents

Table 1 describes the socio-demographic characteristics of respondents, of the 281 respondents 146 (52%) were males and 135 (48%) were females. The distribution of respondents according to age revealed that majority 95 (33.8%) of the respondents were aged above 43 years and above, 46 (16.4%) were aged between 23-27 years, 42 (14.9%) were aged 33-37 years, 35 (12.5%) were 28-32 years, 33 (11.75%) were aged 18-22 years and the least represented 30 (10.7%) were aged 38-42 years. Regarding marital status, the majority 202 (71.9%) were married, 43 (15.3%) were single, 30 (10.7%) were widowed and the least 6 (2.1%) were divorced. By education level, the majority 155 (55.2%) achieved primary level, 72 (25.6%) secondary level, 29 (10.3%) and 25 (8.6%) tertiary level.

By religion, most 131 (46.6) were protestants, followed by Catholics 99 (35.2%), Muslims 10 (3.6%) and 10% were from other religions.

The majority of the respondents 135 (48%) were not employed, 114 (40.6%) were self-employed and the least 32 (11.4%) were in formal employment. The majority (80.4%) of the respondents earned less

than 100,000 UGX. Per month, followed by 38 (13.5%) who earned 100,000-300,000 UGX, 10 (3.65) earned 300,000-500,000 UGX while only 7 (2.5%) earned above 500,000 UGX

Table 1: Univariate analysis of social demographic characteristics of respondents

Variable		Frequency n=281	Percent (%)
Sex	Male	146	52.0
	Female	135	48.0
	Total	281	100.0
Age	18-22years	33	11.7
	23-27years	46	16.4
	28-32years	35	12.5
	33-34years	42	14.9
	38-42years	30	10.7
	43years and above	95	33.8
Marital Status	Single	43	15.3
	Married	202	71.9
	Divorced	6	2.1
	Widowed	30	10.7
Religion	Catholic	99	35.2
	Protestant	131	46.6
	Muslim	10	3.6
	Others	41	14.6
Education Level	No formal education	29	10.3
	Primary	155	55.2
	Secondary	72	25.6
	Tertiary	25	8.9
Employment Status	Employed	32	11.4
	Self employed	114	40.6
	Not employed	135	48.0
Monthly Income	0-100,000	226	80.4
	100,000-300,000	38	13.5
	300,000-500,000	10	3.6
	500,000 above	7	2.5

4.2.1 Bi variant analysis of socio-demographic factors influencing HBV infection.

The socio-demographic factors (sex, gender, level of education, marital status, employment status and level of monthly income) were analyzed using X^2 to establish their association with risk of HBV at 95% confidence interval. The results as shown in table 6 show that marital status was associated with HBV (X^2 14.606 p=0.002)

Table 2: Bivariate analysis of demographic factors

Variables		HBV test results			
		+ve	-ve	X2	P Values
Sex	Male	27(46.6%)	119(53.4%)	8.856	0.379
	Female	31(53.4%)	104(46.6%)		
Age	18-22years	12(20.7%)	21(9.4%)	8.782	0.118
	23-27years	8(13.8%)	38(17.0%)		
	28-32years	9(15.5%)	26(11.7%)		
	33-34years	9(15.5%)	33(14.8%)		
	38-42years	7(12.1%)	23(10.3%)		
	43years and above	13(22.4%)	82(36.8%)		
Marital Status	Single	16(27.6%)	27(12.1%	14.606	0.002
	married	37(63.8%)	165(74.0%)		
	divorced	3(5.2%)	3(1.3%)		
	widowed	2(3.4%)	28(12.6%)		
Religion	catholic	18(31.0%)	81(36.3%)	0.986	0.805
	protestant	28(48.3%)	103(46.2%)		
	Muslim	3(5.2%)	7(3.1%)		
	Others	9(15.5%)	32(14.3%)		
Education Level	no formal education	6(10.3%)	23(10.3%)	0.439	0.932
	Primary	30(51.7%)	125(56.1%)		
	secondary	16(27.6%)	56(25.1%)		
	Tertiary	6(10.3%)	19(8.5%)		
Employment Status	employed	8(13.8%)	24(10.8%)	0.772	0.680
	self employed	21(36.2%)	93(41.7%)		
	not employed	29(50%)	106(47.5%)		
Monthly Income	0-100,000	47(81%)	179(80.3%)	0.182	0.980
	100,000-300,000	8(13.8%)	30(13.5%)		
	300,000-500,000	2(3.4%)	8(3.6%)		
	500,000 above	1(1.7%)	6(2.7%)		

P values of <0.05 were considered significant

4.1.4 Univariate analysis of individual factors

The results displayed in table 4 reveals practices and experiences of respondents in the preceding 12 months. Findings show that 20 (7.1%) of adults had pricked or pierced their body, 12 (4.3%) had sterilized their equipment before use, 45 (16%) had shared needles or razorblades, 11 (3.9%) had received blood transfusion, 23 (8.2%) had an underlying chronic disease, 58 (20.6%) had a positive result for HBV test**,** 23 (8.2%) had got HBV treatment, 34 (12.1%) had completed treatment, 148 (52.3%) had receive HBV vaccine, 97 (34.5%) had completed HBV vaccine. On sexual practices, 99 (34.9%) had two or more sexual partners, 31 (115) had casual sex, 24 (8.5%) had protected sex on a casual encounter, 62 (22.1%) had received treatment for STD, regarding nature of marriage, 170 (60.5%) were in a monogamous marriage while 111 (39.5%) were in a polygamous marriage.

Table 3: Univariate analysis of individual factors

Variable		Frequency n=281	Percent (%)
Practice of body piercing in 12 months	Yes	20	7.1
	No	261	92.9
Equipment sterilized before use	Yes	12	4.3
	No	269	95.7
Sharing needles/Razor with others in 12 months	Yes	45	16.0
	No	236	84.0
Blood transfusion in 12 months	Yes	11	3.9
	No	270	96.1
Underlying chronic illness	Yes	23	8.2
	No	258	91.8
	Total	281	100.0
History of HBV Testing	Yes	281	100
	No	00	0
HBV test results	Yes	58	20.6
	No	223	79.4
History of HBV treatment	Yes	23	8.2
	No	258	91.8
History of completing HBV treatment	Yes	34	12.1
	No	247	88.0
History of vaccination	Yes	148	52.7
	No	133	47.0
Number of HBV Vaccine doses	One	37	13.2
	Two	147	52.3
	Three	97	34.5
Number of sexual partners in 12 months	One	182	64.8
	Two or more	99	34.9
History of practicing casual sex	Yes	31	11.0
	No	250	89.0
History of Protected casual sex	Yes	24	8.5
	No	257	91.5
History of treatment for Sexually Transmitted Disease	Yes	62	22.1
	No	219	77.9
Nature of marriage	Monogamous	170	60.5
	Polygamous	111	39.5

4.2.3 Bivariate analysis of Individual factors Associated with risk of HBV

Individual factors, as shown in table 9 were analyzed using X^2 to establish their association with risk of HBV at 95% confidence interval. Individual factors that were found to be significantly associated with risk HBV were: History of HBV treatment (X2 15.027, p=0.00), history of vaccination for HBV (X2 8.421 p=0.015), Number of vaccine doses completed (X^2 10.216, p=0.006)

Most individual sexual practices were significantly associated with risk of HBV. This include history of sexual partners in the last 12 months (X^2 8.622, p=0.015), History of protected casual sex (X^2 7.083, p=0.012).

Table 4: Bivariate analysis of Individual factors

Variable		HBV test results		X2	P-Value
		+ve	-ve		
Practice of body piercing in 12 months	Yes	4(6.9%)	16(7.2%)	0.005	0.941
	No	54(93.1%)	207(92.8%)		
Equipment sterilized before use	Yes	1(1.7%)	11(4.9%)	1.159	0.470
	No	57(98.3%)	212(95.1%0		
Sharing needles/Razor with others in 12 months	Yes	11(19.0%)	34(15.2%)	0.473	0.547
	No	47(81.0%)	189(84.8%)		
Blood transfusion in 12 months	Yes	5(8.6%)	6(2.7%0	4.303	0.058
	No	53(91.4%)	217(97.3%)		
Underlying chronic illness	Yes	5(8.6%)	18(8.1%)	0.180	0.535
	no	53(91.4%)	205(91.9%)		
History of HBV treatment	Yes	12(20.7%)	11(4.9%)	15.027	0.000**
	No	46(79.3%)	212(95.1%)		
History of completing HBV treatment	Yes	7(12.1%)	27(12.1%)	0.261	0.877
	No	51(87.9%)	196(87.8%)		
History of vaccination	Yes	21(36.2%)	127(57.0%)	8.421	0.015**
	No				
Number of HBV Vaccine doses	One	8(13.8%)	29(13.0%)	10.216	0.006**
	Two	40(69.0%)	107(48%)		
	Three	10.000	87.000		
Number of sexual partners in 12 months	One	30(51.7%)	152(68.2%)	8.622	0.013**
	Two or more	28(46.6%)	71(31.8%)		
History of practicing casual sex	Yes	13(22.4%)	18(8.1%)	9.646	0.003**
	No	45(77.6%)	205(91.9%)		
History of Protected casual sex	Yes	10(17.2%)	14(6.3%)	7.083	0.012**
	No	48(82.8%)	209(93.7%)		
History of treatment for Sexually Transmitted Disease	Yes	10(17.2%)	52(23.3%)	0.989	0.209
	No	48(82.8%)	171(76.7%)		
Nature of marriage	Monogamous	30(51.7%)	140(62.8%)	2354.000	0.084
	Polygamous	28(48.3%)	83(37.2%)		

4.1.3 Univariate analysis of knowledge factors among study respondents

Knowledge factors were categorized into knowledge of HBV transmission items, knowledge of prevention items, knowledge of signs and symptoms, and knowledge of HBV services. Each category

was then assessed on a scale of 0 - 2. Those who did not know anything in the category scored 0 (no knowledge), those who knew one item scored 1(poor) and knowing 2 or more items scored 2 (adequate). As such level of adequate knowledge on transmission of HBV was 36.3%, adequate knowledge on prevention of HBV was 95(33.8%), adequate knowledge on HBV services was 92 (32.7%) and knowledge on signs & symptoms of HBV 78 (27.8%). However the study found that majority 246 (87.5%) knew that hepatitis is a disease affecting the liver, 14 (5%) said it's a disease that causes yellowing of eyes and 5 (1.8%) said it causes fever.

Table 5: Univariate analysis of level of knowledge factors

Variable		Frequency n=281	Percent (%)
Level of knowledge on HBV transmission	No knowledge on transmission	41	14.6
	Poor	138	49.1
	Adequate	102	36.3
Level of knowledge on HBV prevention	No knowledge	23	8.2
	Poor	163	58.0
	Adequate	95	33.8
Knowledge of HBV Service	No knowledge	11	3.9
	Poor	178	63.3
	Adequate	92	32.7
	Total	281	100.0
Knowledge of signs and symptoms of HBV	No Knowledge	71	25.3
	Poor	132	47.0
	Adequate	78	27.8
What is Viral Hepatitis HB?	Viral disease affecting the liver	246	87.5
	Disease causing yellowing of white part of the eye and hands	14	5.0
	Disease causing fever,	5	1.8
	I don't know	16	5.7

Individual items on knowledge factors were further analyzed to find out what respondents knew about HBV as shown in *Table 3* (Page 40). Participants were asked to tick if they agree with the given statements in regards to HBV transmission and their responses were; 89 (31.7%) agreed with sharing sharps, 53 (18.9%) prick from unsterile object, 65 (23.1%) handling body fluids with bear hands and 17 (6%) said they did not know.

On how HBV is prevented, 163 (58%) agreed with completing vaccination, 159 (56.6%) agreed with having protected sex, 70 (24.9%) agreed with using water proof gloves when handling body fluids, 39 (13.9%) agreed with using sterile object when cutting nails or piecing the body, 50 (17.8%) on completing treatment, while 21 (7.5%) said they did not know.

When asked what are HBV related services at health facilities, majority 240 (85.4%) agreed on vaccination, 44 (15.7%) treatment of HBV, 100 (35.6%) educating the public and 14(5%) did not know. On signs and symptoms, 124 (44.1%) agreed that yellowing of skin and white part of eyes was a sign of HBV, 39 (13.9%) agreed with fever, 49 (17.4%) dark urine, 93 (33.1%) abdominal pain and 70 (24.9%) did not know.

Table 6: Univariate analysis of particular knowledge factors.

Variable		Frequency n=281	Percent (%)
How is HBV transmitted?			
Sharing sharp objects	yes	89	31.7
	no	192	68.3
	Total	281	100.0
Prick from unsterile objects	yes	53	18.9
	no	228	81.1
Handling body fluids	yes	65	23.1
	no	216	76.9
Don't know	yes	17	6.0
	no	264	94.0
How is HBV prevented?			
Completing HBV vaccination	yes	163	58.0
	no	118	42.0
Having protected sex	yes	159	56.6
	no	122	43.4
Using water proof gloves when handling body fluids	yes	70	24.9
	no	211	75.1
	Total	281	100.0
Using only sterile objects when cutting nails or pricking body	yes	39	13.9
	no	242	86.1
Competing HBV treatment	yes	50	17.8
	no	231	82.2
Don’t know	yes	21	7.5
	no	260	92.5
What are HBV services?			
Vaccination of HBV	yes	240	85.4
	no	41	14.6
Treatment for HBV	yes	44	15.7
	no	237	84.3
Educating the public about HBV	yes	100	35.6
	no	181	64.4
Don't Know	yes	14	5.0
	no	267	95.0
What are s/s of HBV infection?			
Yellowing of skin and white part of Eyes	yes	124	44.1
	no	157	55.9
	Total	281	100.0
Vomiting and nausea	yes	39	13.9
	no	242	86.1
Fever	yes	81	28.8
	no	200	71.2
Dark urine	yes	49	17.4
	no	232	82.6
Abdominal pain	yes	93	33.1
	no	188	66.9
Don’t know	yes	70	24.9
	no	211	75.1

4.2.2 Knowledge level factors associated with HBV

Knowledge level factors (level of knowledge on transmission, Signs and symptoms, prevention and services available) were analyzed using X^2 to establish their association with risk of HBV at 95% confidence interval. None of knowledge factors was associated with risk of HBV as shown in table 7. However as shown in table 8, knowing that handling body fluid with bear hands can transmits HBV and that completing HBV treatment prevents HBV transmission were associated with risk of HBV.

Table 7: Bivariate analysis of Level knowledge factors

		HBV test results			
		+ve	-ve	X2	P.values
Level of knowledge on HBV transmission	No knowledge on transmission	11(19.0%)	30(13.5%)	1.122	0.570
	Poor	27(46.6%)	111(49.8%)		
	Adequate	20(34.5%)	82(36.8%)		
Level of knowledge on HBV prevention	No knowledge	4(6.9%)	19(8.5%)	0.241	0.887
	Poor	35(60.3%)	128(57.4%)		
	Adequate	19(32.8%)	76(34.1%)		
Knowledge of HBV Service	No knowledge	3(5.2%)	8(3.6%)	0.363	0.834
	Poor	37(63.8%)	141(63.2%)		
	Adequate	18(31.0%)	74(33.2%)		
Knowledge of signs and symptoms of HBV	No Knowledge	14(24.1%)	57(25.6%)	0.274	0.872
	Poor	29(50.0%)	103(46.2%)		
	Adequate	15(25.9%)	63(28.3%)		

P values of <0.05 were considered significant

Table 8: Bivariate analysis of knowledge factors influencing risk of HBV infection

Variable		HBV test result		X2	P. Values
		+ve	-ve		
What is Viral Hepatitis HB?	Viral disease affecting the liver	49(84.5%)	197(88.3%)	4.945	0.176
	Disease causing yellowing of white part of the eye and hands	6(10.3%)	8(3.6%)		
		10.3%	3.6%		
		1.7%	1.8%		
	I don't know	2(3.4%)	14(6.3%)		
How is HBV transmitted?					
Unprotected sex	yes	45(77.6%)	178(79.8%)	0.14	0.416
	no	13(22.4%)	45(20.2%)		
Sharing sharp objects	yes	17(29.3%)	72(32.3%)	0.188	0.752
	no	41(70.7%)	151(67.7%)		
Prick from unsterile objects	yes	10(17.2%)	43(19.3%)	0.125	0.851
	no	48(82.8%)	180(80.7%)		
Handling body fluids	yes	7(12.1%)	58(26.0%)	5.03	0.040
	no	51(87.9%)	165(74.0%)		
Don't know	yes	6(10.3%)	11(4.9%)	2.372	0.112
	no	52(89.7%)	212(95.1%)		
How is HBV prevented?					
Completing HBV vaccination	yes	33(56.9%)	130(58.3%)	0.037	0.481
	no	25(43.1%)	93(41.7%)		
Having protected sex	yes	30(51.7%)	129(57.8%)	0.703	0.458
	no	28(48.3%)	94(42.2%)		
Using water proof gloves when handling body fluids	yes	10(17.2%)	60(26.9%)	2.298	0.172
	no	48(82.8%)	163(73.1%)		
Using only sterile objects when cutting nails or pricking body	yes	8(13.8%)	31(13.9%)	0	1.000
	no	50(86.2%)	192(86.1%)		
Competing HBV treatment	yes	14(24.1%)	36(16.1%)	2.011	0.178
	no	44(75.9%)	187(83.9%)		
Don't know	yes	3(5.2%)	18(8.1%)	0.56	0.335
	no	55(94.8%)	205(91.9%)		
What are s/s of HBV?					
Yellowing of skin and white part of Eyes	yes	22(37.9%)	102(45.7%)	1.138	0.303
	no	36(62.1%)	121(54.3%)		
Vomiting and nausea	yes	11(19.0%)	28(12.6%)	1.582	0.207
	no	47(81.0%)	195(87.4%)		
Fever	yes	17(29.3%)	64(28.7%)	0.008	1.000
	no	41(70.7%)	159(71.3%)		
Dark urine	yes	13(22.4%)	36(16.1%)	1.257	0.331
	no	45(77.6%)	187(83.9%)		
Abdominal pain	yes	17(29.3%)	76(34.1%)	0.473	0.535
	no	41(70.7%)	147(65.9%)		
Don't know	yes	15(25.9%)	55(24.7%)	0.035	0.865
	no	43(74.1%)	168(75.3%)		
What are HBV services?					
Vaccination of HBV	yes	52(89.7%)	188(84.3%)	1.057	0.404
	no	6(10.35%)	35(15.7%)		
Treatment for HBV	yes	8(13.8%)	36(16.1%)	0.193	0.839
	no	50(86.2%)	187(83.9%)		
Educating the public about HBV	yes	18(31.0%)	82	0.661	0.446
	no	40(69.0%)	141(63.2)		
Don't know	yes	5(8.6%)	9(4.0%)	2.044	0.175
	no	53(91.4%)	214(96.0%)		

P values of <0.05 were considered significant

4.1.5 Univariate analysis of health facility factors

As presented in table 5 below, the majority 212 (75.45%) of respondents lived within 5 Km reach of a health facility, 22.4 (22.4%) lived 5 - 10 Km away, while only 6 (2.1%) lived 10 km or more away. The majority 236 (84%) of the respondents said HBV services were available, while 45 (16%) disagreed. On availability of HBV services at the health facilities, a quarter 75 (26.7%) of the adults said they were no services and indicated that HBV services were missing at health facilities in their reach, majority 219 (77.9%) said there were vaccination services at the health facilities, 53 (18.9%) concurred that there were HBV screening services and 9 (3.2%) said there were treatment services. On cost of HBV services, the majority paid between 500 and 2,000 UGX, most 128 (45.6%) did not pay and the least 7(2.5%) paid above 2000 UGX.

Table 9: Univariate analysis of health facility factors

Variable		Frequency n=281	Percentage (%)
Distance from nearest Health facility	Less than 5 KM	212	75.4
	5-10Km	63	22.4
	More than 10Km	6	2.1
Availability of HBV Services at nearest facility	Yes	236	84.0
	No	45	16.0
Lack of HBV services at the nearest health facility	Yes	75	26.7
	No	206	73.3
Type of unavailable services	Screening	53	18.9
	Vaccination	219	77.9
	Treatment	9	3.2
Cost of HBV services	did not pay	128	45.6
	500-2000	146	52.0
	2001 and above	7	2.5

4.2.3 Bivariate analysis of Health facility factors

Health facility factors as shown in table, 10 were analyzed using X^2 to establish their association with risk of HBV at 95% confidence interval. Health facility factors that were found to be significantly associated with risk of HBV were cost of HBV services(X^2 19.215, p=0.00)

Table 10: Bivariate analysis of Health facility factors influencing risk of HBV

Variable		HBV test results			
		+ve	-ve		
Distance from nearest Health facility	Less than 5 KM	44(75.9%)	168(75.3%)	0.06	0.971
	5-10Km	13(22.4%)	50(22.4%)		
	More than 10Km	1(1.7%)	5(2.2%)		
Availability of HBV Services at nearest facility	Yes	46(79.3%)	190(85.2%)	1.188	0.315
	No	12(20.7%)	33(14.8%)		
Lack of HBV services at the nearest health facility	Yes	15(25.9%)	60(26.9%)	0.026	0.509
	No	43(74.1%)	163(73.1%)		
Type of unavailable services	Screening	14(24.1%)	39(17.5%)	1.379	0.503
	vaccination	42(72.4%)	177(79.4%)		
	treatment	2(3.45)	7(3.1%)		
Cost of HBV services	did not pay	27(46.6%)	101(45.3%)	19.215	0.000
	500-2000	25(43%)	121(54.3%)		
	2001 and above	6(10.3%)	1(0.4%)		

P values of <0.05 were considered significant

4.3 Multivariate analysis on factors influencing risk of HBV

In order to determine factors that jointly influence the risk factors of HBV among adults in Ngora, a binary logistic regression model was fitted and results presented as shown in table 11 below. The dependent variable was dichotomous and grouped as positive test result -1 and negative test result -2. Dependent variable was then regressed with a set of independent categorical variables which includes; knowledge of transmission category (don't know-1, handling of body fluids -2, Prick from unsterile

objects -3, sharing sharp objects 4, unprotected sex 5), History of vaccination following a negative test result (No-1 and Yes 2), History of treatment for STI (No-1, yes 2), Cost of services (paid>2000 UGX-3, paid 500-2000 UGX-2, did not pay-1).

The result in *Table 11* shows variables when combined jointly influence risk of HBV.

Table 11: Multivariate analysis of factors influencing risk of HBV

Variable	Odds Ratio	95% C.I. for EXP(B)	
		Lower	Upper
Handling of body fluids (2)	3.087	1.124	8.480
History of vaccination following a negative HBV test(2)	1.018	.263	3.941
History of treatment for STI (1)	1.409	.540	3.673
Cost of services(2)	9.742	.906	104.793
Cost of services(3)	10.797	1.031	113.050

CHAPTER FIVE: DISCUSSION

5.0 Introduction

This chapter discusses finding of the study, compares and contrasts them with findings of related studies.

5.1 Prevalence of HB virus among the respondents

The study found a 20.6% prevalence of HBV infection among adults in Ngora. This is higher than the national average of 10%, these findings confirm a high burden of HBV in North Eastern region from an earlier study by Bwogi et al, (2009). In the study by Bwogi et al, findings showed that the prevalence of active HBV in the region was higher than the national average at 18.5-23.9% as compared to the national average of 10.3%. They further found out that predictors of HBV were residing in the Northeastern region of Uganda and being an Iteso at OR 3.5 (CI 1.5 – 8.1), and OR 1.4 (CI 0.7 – 2.8) respectively in comparison to central region. The national survey attributed the findings to poverty, multiple sexual partners, low education level, nature of employment (agriculture and manual work) and low income level as risk factors of HBV. This is in agreement with this study since study findings show that majority of adults were not employed, earned less than 100,000 UGX a month and most had primary level of education and below. In my view an integrated multi sectoral approach I required in order to counter the high burden of HBV infection in the region.

5.2 Demographic factors among the respondents

Among demographic factors only marital status was found to be significantly associated with HBV infection. Findings are in agreement with a study from Iran (Mohammad M. et al., 2009) this was a study among HIV positive mothers attending anti natal care. In that study married patients with HBV were more than those in the single category (24% and 7.2%) respectively. HBV/HCV co-infection rate was also found to be higher among married women 10.6% as compared to their single counterparts 5.7% respectively.

However, this study found no relationship between HBV infection and other demographic factors such as age, sex, employment status, and level of income. This contradicts previous studies by (Van der veen Y.J et al 2010, Mohammadi M.et al., 2009, Olokoba et al) were these factors were significantly associated to HBV infection. This contrast could have been brought about by differences in study population and the sampling techniques used in the different studies.

Findings from this study suggest a normally distributed risk of HBV among all adults in Ngora, this indicates that all male and female, of all age group and income level have the same risk of acquiring HBV hence prevention strategies should target all adults.

5.4 Individual factors influencing risk of HBV

These study findings indicated that the risk factors of HBV infection among adults in Ngora were predominantly individual factors. The most outstanding was history of STI treatment, followed by increased number of sex partners, the risk of HBV among adults who had ever had STI treatment was 1.4 times more compared to that of adults who did not have a history of STI treatment. There was very limited data on the association between HBV and STIs but never the less there was literature on number of sexual partner in relation to HBV, note that STI are synonymous with increased number of sexual partners making this study be in agreement with a number of other studies. For instance, in a Ugandan national survey Bwogi et al (2009) deduced that there was an increased risk to HBV among study subjects that had more lifetime partners as compared to those that were strictly monogamous or had a single sexual partner. Their study clearly indicated that having more than 4 partners in a lifetime increased HBV risk to more than 1.4 times OR 1.4(1.1-1.7) as compared to one partner. Bwogi's study was also in agreement with another study done in Brazil by (Fereira R.C et al, 2009), among none injectable drug users in Brazil. Findings from the Brazilian study were similar to those of this study and that of Bwogi et al, it reported that, having more than 10 lifetime sexual partners was a great risk to HBV infection.

Multiple sexual partners have been found to increase the risk of other sexually transited diseases like HIV, syphilis gonorrhea's among others. Reduction of sexual network strategies has been successful in the campaign against HIV in Uganda. Findings imply that behaviors change campaigns should be enhanced in the district in regard to HBV control.

History of practicing casual sex was found to be significantly associated with risk of HBV among adults in Ngora district. Such findings have been found in China (Jiang et al., 2006) where casual sexual relationships are short lived aimed at majorly fulfilling sexual desires at that point in time. Issues of faithfulness and knowing ones sexually transmitted disease status are not discussed since most casual sex involve benefits, gifts or money to either party hence coercion into unprotected sex. The study findings suggest the need to target sexually active population such as commercial sex workers and their possible clients such as long distance drivers, road contractors and fishermen in the fight against HBV.

Among the Ateso community, a population from which the respondents were drawn, multiple sexual partners is quite acceptable especially among men. Sexual practices such as polygamy, extramarital sex, sex before marriage, wife inheritance all promote multiple sexual partnerships, in my view, HBV prevention campaigns should target such practices for behavior change to reduce the spread of HBV

History of vaccination following a negative HBV test is a predictor of risk of HBV. In this study, adults who were not vaccinated were up to 4 times likely to contract HBV compared to those who got a vaccine, this is because completing the three doses of hepatitis B vaccine is effective in providing individual immunity. This in agreement with a previous study done by Braka were he found low HBV immunization levels in Uganda (Braka F., et al., 2006) among health workers. He found out that despite majority 60.1% of health workers having evidence of HBV infection, 8.7% being chronic carriers and 0.3% being acutely infected, only 5.1% reported at least one dose of HBV and only 3.6% were immune through vaccination.

A mathematical model by (Susan T.G., 2005) suggested that Routine infant hepatitis B vaccination, with 90% coverage having the first dose being administered at birth would prevent 84% of global HBV-related deaths. While routine vaccination among infants has been effective since 2002, most adults remain unvaccinated. Vaccination programs should therefore target young people and adults and develop a follow-up mechanism to ensure completion of vaccine doses.

Study findings also suggest history of treatment of HBV to be associated with present status of HBV infection this is because HBV treatment does not ensure full recovery reason to why victims should endeavor to adhere to follow up. Findings from this study are in agreement with study findings from a reports from Nigeria (Rumi et al., 1998) among women who attended antenatal care. In that study HBsAg-positive mothers who received Hepatitis B immunoglobulin reduced transmission to 23%. And combination of HBIG and hepatitis vaccination reduced transmission to3%, this further emphasizes the need to prioritize treatment of HBV alongside screening and vaccination programs.

This study also found that having protected sex was a protective factor to HBV infection, adults who reported using condoms were less likely to acquire HBV infection as compared to this that did not use condoms. This was in total agreement with a study conducted in Nigeria by (Ikeako L. et al, 2014). In the Nigerian study, use of male and female condoms was found have a >97% protection against viral infections. Condoms are a major barrier methods for preventing sex transmitted diseases and hence findings imply that awareness campaign should promote condom use as a major preventive message for HBV prevention.

5.3 Knowledge factors influencing risk of HBV of the respondents

This study found a significant association between participants' knowledge, that handling body fluids with bear hands is a risk factor of HBV infection and HBV infection status. Adults in Ngora who did not know that handling fluids with bear hands led to transmission of HBV, were three times more likely to contract HBV (OR 3.087 and p,0.029) than those who knew otherwise. Handling body fluids has been known to be a predictor of HBV as highlighted in a cohort study that was carried out in

Libya (Fraka, E., et al 2009) the study sought to compare the prevalence of HBV infection among biomedical waste handlers and those who had never been exposed to biomedical waste. Findings showed that the prevalence of HBV infection was higher among the biomedical waste handlers and very low among their counterparts. The study further attributed the high level of HBV infection to low knowledge since only 7% of participants had ever received training on HBV.

Findings indicate the need to equip adult population with skills on handling body fluids especially in areas of first aid and home deliveries. It should also be noted that the importance of using waterproof gloves should be emphasized during health education. This is particularly important in the view that adults in Ngora district have poor education on HBV virus transmission, prevention and available services despite radio talk shows and community outreaches on HBV.

All the other knowledge factors were not in any way associated with HBV infection status this is disagreement with a study done in Pakistan (Kamel. E., 2008) among barbers were findings revealed that, barbers who knew nothing about HBV transmission, vaccination and treatment had a > 96.2% chance of transmitting HBV to their clients. This difference may have been brought about by the difference in study population, study design and sampling technique.

5.5 Health facility factors

Cost of HBV services was a predictor of risk of HBV. Clients who paid more than 2000 UGX for HBV services were up to 10 times at risk of contracting HBV. Findings are similar to previous studies (Gregory T. et al 2007, Ferira R.C. et al 2009) which concluded that access to HBV services contribute to high prevalence of HBV. Given that half of adults in Ngora were not in any form of employment and that the majority earned less than 100,000UGX, findings indicate the need to provide HBV services at absolutely free cost. Screening campaigns from 2014 to late have been free. However clients have been referred for HBV treatment and vaccination to health facilities that charge for these services.

History of seeking HBV services was found to be associated with risk of HBV services. Findings are in agreement with a study in Kenya (Suckling, R.M., 2006) found low immunization level among health workers despite 30% of them reporting one or more needle stick injuries in the previous year, only 12.8% had received HBV vaccination. Even then, self motivated uptake of HBV vaccine was low in district hospitals at 44%. These findings were slightly higher than those reports from a study in Mulago hospital (Ziraba et al 2009) which found vaccination rate at 6%. Health seeking behavior in relation to HBV has not been documented among the general population in Uganda. Findings suggest that self driven behavior to seek HBV services are necessary in combating high prevalence of HBV in Ngora district. However, availability of these services at all levels is a central pillar in designing HBV strategies.

Seeking hepatitis B services enable clients to get information on hepatitis B from health workers, get vaccinated in time if screened and found negative and get treated or referred for treatment if found positive. It also prepares the client who is in close contact with infected patients to protect self from infection. Findings also indicate that awareness campaigns should run alongside increasing access to HBV services. Strategies should be in place to take screening, vaccination and treatment of HBV to lower level of health facilities.

CHAPTER SIX: CONCLUTION AND RECOMMENDATION

6.0 Introduction

This chapter outlines conclusions and recommendations derived from the study findings.

6.1 conclusions

Adults in Ngora district are at high risk of contracting HBV with a self reported prevalence of 20.6%. The individual factors that were associated with HBV infection were history of vaccination following a negative HBV result and history of treatment for STIs. Respondents who had been vaccinated after a negative HBV test stood a protective advantage over their counterparts who had not been vaccinated. Respondents that had ever been treated of an STI were more likely to be infected with HBV infection as compared to their counterparts who have never received STI treatment. Previous STI treatment was an indication of risky sexual behavior, the route through which HBV infection is majorly transmitted.

The knowledge factors that was significantly associated with HBV infection was knowledge that handling body fluids was a source of HBV infection transmission. All the respondents that had no knowledge to this were three times more likely to contract the HBV infection compared to their counter parts that had knowledge about it.

The Health facility factor that came out significant was the cost of the HBV services; respondents who were charged more than 2000 UGX for any HBV service were ten times more likely to contract HBV infection as compared to those who paid less or no money at all. This was an indication that most of the respondents that were charged more than 2000 UGX shunned the HBV services.

6.2 Recommendations

Findings showed that, inadequate knowledge on transmission of HBV through handling body fluids with bear hands was highly associated with HBV infection. In relation to this I recommend that the MOH in conjunction with the health administrators of Ngora district should engage in increased sensitization and health education on HBV infection to the people of Ngora

Cost of HBV services came out clearly as a hindrance to access of HBV services and was significantly associated with HBV infection. I recommend provision of reliable, free and safe HBV screening, vaccination and treatment to all people in Ngora district and Uganda at large. This is specifically directed to the Uganda government (MOH), the district health office and facility heads.

I also recommend further studies on HBV infection in Uganda and especially those that are biomedical in nature, this will enrich the knowledge pool and bridge the current knowledge gap on HBV infection.

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APPENDIX I: CONSENT FORM

My name is Doreen Masika a student of International Health Sciences University pursuing a Masters course in Public Health. I am interviewing people aged 18-50 years in a study to determine risk factors for HBV infection among adults aged 18-50 years in Ngora district.

Information you provide is confidential and your name will not be written on this form. You may skip the question you don't want to answer and go to the next. Your participation in the study is voluntary.

There are no direct benefits such as money or goods to an individual who participates in the study. There are no risks to an individual associated with this study.

Study outcome will benefit the health care system, people of Ngora and the country at large in identifying opportunities for improving HBV prevention, control and treatment.

I confirm that I have read and understood the statements and aims of the above study. I accept /do not accept (delete as applicable) to take part in the above study

Signature …… date ……

Name of Researcher/Assistant Signature Date

……. …….. ……..

APPENDIX II: QUESTIONAIR

DEMOGRAPHIC DATA

1. Sex:

   Male [ ] Female [ ]

2. How old are you in full years? ……..

   18-22 years [ ]

   23-27 years [ ]

   28-32 years [ ]

   33-37 years [ ]

   38-42 year [ ]

   43years and above [ ]

3. What is your marital status

   Single [ ]

   Married [ ]

   Separated/divorced [ ]

   Widowed [ ]

4. What is your religious affiliation?

   Catholic [ ]

   Protestant [ ]

   Muslim [ ]

   Others [ ]

5. What is your level of education?

   No formal education [ ]

Primary [ ]

Secondary [ ]

Tertiary [ ]

6. What is your employment status

   Employed [ ]

   Self employed [ ]

   Not in any form of employment [ ]

7. What is your Level of monthly income in Uganda Sh.?

   0-100,000 UGX [ ]

   100,000-300,000 UGX [ ]

   300,000-500,000 UGX [ ]

   500,000 UGX and above [ ]

LEVEL OF KNOWLEDGE ON HBV INFECTION

8. What is viral hepatitis B?

   It's a viral disease affecting the liver [ ]

   It's a disease causing yellowing of the white part of the eye and hands [ ]

   It's a disease that causes fever, vomiting and abdominal pain [ ]

9. How is HBV transmitted?

Tick “Yes” if you think the statement is correct and “No” is the statement is wrong.

Statement	Yes	No
Having unprotected sex with someone suffering from HBV		
Sharing of needles, razor blades and other sharp objects		
Pricking or cutting the skin with unsterile objects		
Handling body fluid such as blood, birth fluid, sexual fluids with bare hands		

10. How can someone prevent himself from getting HBV infection?

Tick “Yes” if you think the statement is correct and “No” is the statement if you think the statement is wrong.

Statement	Yes	No
Completing HBV vaccination		
Having protected sex by correct use of condoms		
Using water proof gloves while handling body fluids such as blood and birth fluids		
Using only sterile object to cut our nails or prick our body.		
Completing HBV treatment as prescribed by the doctor		

11. What HBV services do you know that are offered at your nearest Health center?

    Only tick the ones you are aware of.

Vaccination for HBV	
Treatment for HBV	
Educating the public about HBV	

12. What are the signs and symptoms of HBV do you know?

Yellowing of skin and white part of the eyes	
Nausea and vomiting	
Fever /hotness of the body	
Dark urine	
Abdominal pain	

INDIVIDUAL FACTORS

13. Have you practiced body pricking such as cultural body marking, tattooing, ear pricking in the last 12 months?

    Yes [ ] No [ ]

14. Ife yes, were the equipments you used sterilized before body pricking was carried out?

    Yes [ ] No [ ]

15. Have you used a needle/razor blade or any sharp object that was used by another person in the last 12 months

    Yes [ ] No [ ]

16. Do you have any underlying chronic illness such as TB/ Diabetes/ AIDS?

    Yes [ ] No [ ]

17. Have you ever been tested for HBV infection ?

    Yes [ ] No [ ]

    If yes, what was the result?

    Positive [ ] Negative [ ]

18. If positive, did you get any treatment for HBV infection?

    Yes [ ] No [ ]

    If yes, did you complete treatment as prescribed by the doctor?

    Yes [ ] No [ ]

19. If the test was negative, were you vaccinated for HBV?

    Yes [ ] No [ ]

    If yes, how many doses have you received to date?

    One [ ] Two [ ] Three [ ]

20. How many sexual partners have you had sexual intercourse with in the past 12 months?

    One [ ] Two or more [ ]

21. Have you practiced casual sex (sex with none regular partner or prostitute)?

    Yes [ ] No [ ]

22. If yes did you or your partner use protection (male or female condom)?

    Yes [ ] No [ ]

23. If you are married, what is the nature of your marriage?

    Monogamous [ ] Polygamous [ ]

HEALTH PROVIDER FACTORS

24. How far in Km is the nearest HC 111 or H CIV or Hospital from your home?

    Less than 5 km [ ]

    5-10 Kms [ ]

    More than 10 Kms [ ]

25. Are there HBV services in this nearest health center?

    Yes [ ] No [ ]

26. Have you ever gone to the nearest health facility to receive HBV service but found that the services were not available?

    Yes [ ] No [ ]

27. If yes how much did you pay for the services?

    Did not pay for the services [ ]

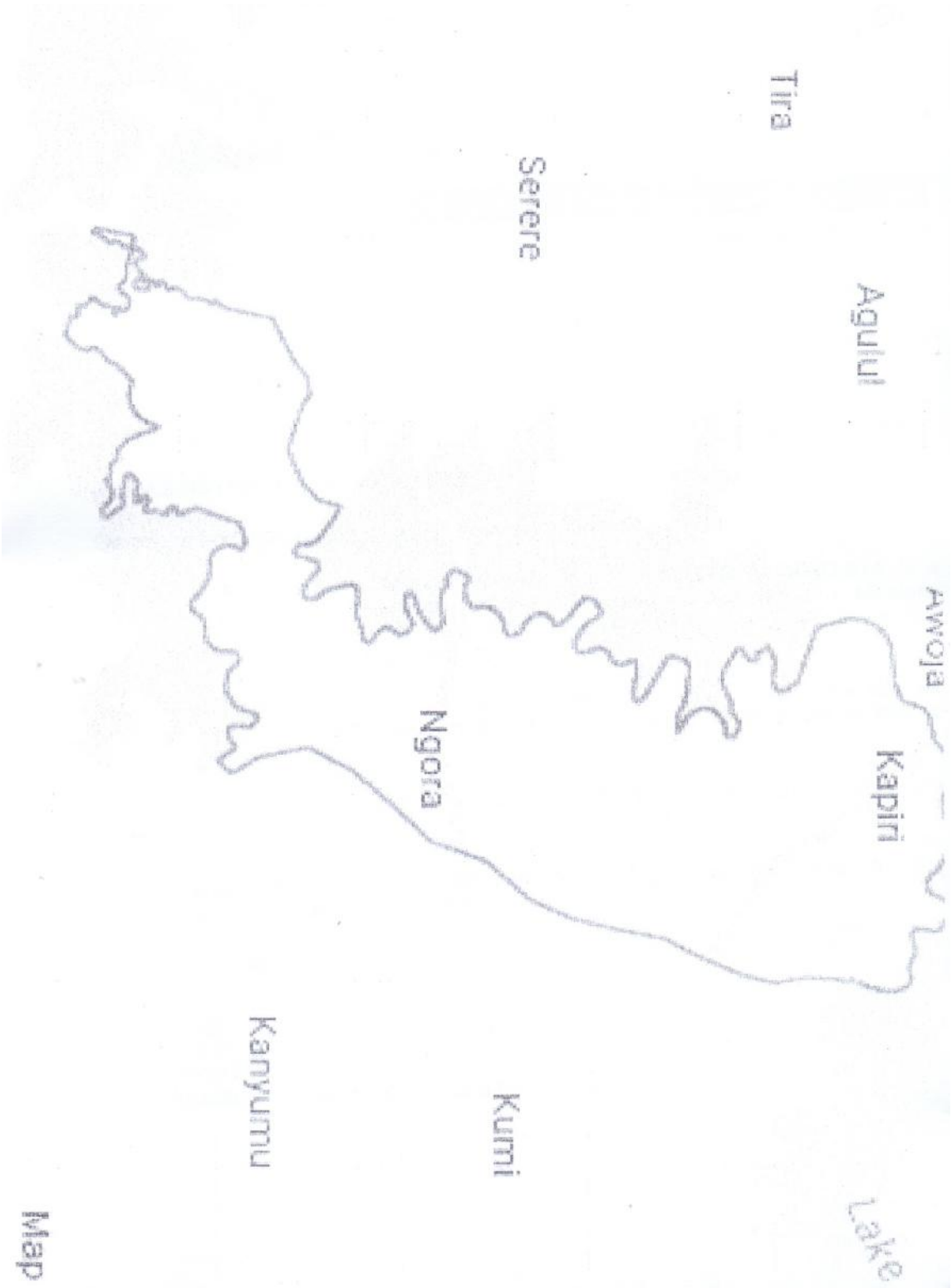
    500-2,000 UGX. [ ]

    3,000-5,000 UGX. [ ]

    5,000-10,000 UGX. [ ]

    Above 10,000 UGX [ ]

APPENDIX III: MAP OF NGORA



APPENDIX IV: INTRODUCTORY LETTER AND CORRESPONDENCE

File

IHSU INTERNATIONAL HEALTH SCIENCES UNIVERSITY
sanitas per scientiam

making a difference to health care

Dean's Office-Institute of Public Health and Management

Received 7/11/2016
M. Cluke Isaac

Kampala, 28th October 2016

THE DHO
NGORA DISTRICT
MR/DR EILU EMMANUEL

to Avail Masika Doreen akoli VAT.

Dear Sir/Madam,

RE: ASSISTANCE FOR RESEARCH

Greetings from International Health Sciences University.

This is to introduce to you **Masika Doreen** Reg. No. **2014-MPH-WKND-014** is a student of our University. As part of the requirements for the award of a Masters Degree of Public Health, the student is required to carry out field research for the submission of a Research Dissertation

Doreen would like to carry out research on issues related to: **Risk Factors of Hepatitis B Virus (HBV) Infection Among Adults Aged 15-49 years in Ngora District.**

I therefore request you to render the student such assistance as may be necessary for research.

I, and indeed the entire University are thanking you in anticipation for the assistance you will render to the student.

Sincerely Yours,

IHSU INTERNATIONAL HEALTH SCIENCES UNIVERSITY
★ 28 OCT 2016 ★
INSTITUTE OF PUBLIC HEALTH AND MANAGEMENT

Alege John Bosco
Dean, Institute of Public Health and Management

The International Health Sciences University
P.O. Box 7782 Kampala – Uganda
(+256) 0312 307400 email: deaniphm@ihsu.ac.ug
web: www.ihsu.ac.ug

APPENDIX V: LIST OF RESAERCH ASSISTANTS

NGORA DISTRICT LOCAL GOVERNMENT

FOR DISTRICT HEALTH OFFICER
NGORA DISTRICT

ATTENDANCE SHEET

DISTRICT HEALTH OFFICE

ACTIVITY: Data collection for the Survey on risk factors of HEP B virus in Ngora.

DATE: 1st – 9th / November / 2016

No	Name	Designation	Place of Work	Telephone No.	Sign
01	OKIROR BOSCO	VHT	MUKURA	0787736[illegible]	
02	AMYAT ANNA G	VHT	MUKURA	0787055566	
03	AISU LOYCE	VHT	KOBWIN/ACIISA	0771399585	
04	OKUMU SIMBLOUS	VHT	Ngora T/Council	0780346[illegible]	
05	OKIRE CHARLES	V.H.T	KADOK KADOK C/O	0783502136	
06	ODIA FRANCIS	VHT	KADOK-AJEJA	0783502136	
07	IKALAMU BEATRICE	V.H.T	ACHSA – OKATACA	0779318934	
08	AGWANG ANGELLA	V.H.T	NGORA T/C	0785844553	
09	EPEGAI RUTH	V.H.T	MUKURA	0778474951	
10	OPOLOI CONSTANT	VHT	NGORA T/C	0772396674	
11	ONGODIA PENINA	VHT	NGORA T/C	0777809444	
12	ACAM ESTHER	VHT	MUKURA	0779216854	

FOR DISTRICT HEALTH OFFICER
NGORA DISTRICT