



**COLLEGE OF HEALTH SCIENCES
SCHOOL OF NURSING AND MIDWIFERY
DEPARTMENT OF MIDWIFERY**

**SEROPREVALENCE AND ASSOCIATED FACTORS OF
HUMAN IMMUNODEFICIENCY VIRUS, HEPATITIS B VIRUS,
AND SYPHILIS AMONG PREGNANT MOTHERS ATTENDING
ANTENATAL CARE AT GOVERNMENTAL HOSPITALS IN
ADDIS ABABA, ETHIOPIA, 2021**

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**A THESIS SUBMITTED TO ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCES SCHOOL OF NURSING
AND MIDWIFERY DEPARTMENT OF MIDWIFERY IN
PARTIAL FULFILLMENT OF THE REQUIREMENT FOR A
MASTER OF SCIENCE DEGREE IN MATERNITY AND
REPRODUCTIVE HEALTH NURSING**

JUNE 2021

ADDIS ABABA, ETHIOPIA

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GOVERNMENTAL HOSPITALS IN ADDIS ABABA, ETHIOPIA, 2021.**

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ADDIS ABABA, ETHIOPIA

APPROVAL SHEET
ADDIS ABABA UNIVERSITY COLLEGE HEALTH SCIENCES
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DEPARTMENT OF MIDWIFERY

I have submitted my original work on a title: Seroprevalence and associated factors of human immunodeficiency virus, hepatitis b virus, and syphilis among pregnant mothers attending antenatal care at governmental hospitals in Addis Ababa, Ethiopia, 2021.

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I thus declare, by my signature below, that this research thesis on: Seroprevalence and associated factors of human immunodeficiency virus, hepatitis b virus, and syphilis among pregnant mothers attending antenatal care at governmental hospitals in Addis Ababa, Ethiopia is my work and all the sources that I have used indicated and acknowledged through complete references. This work has also never been submitted for any other degree at any other institution.

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ACKNOWLEDGMENTS

Truly speaking, the endeavor of me cannot be achieved without the help of the omnipotent and almighty of God as well as his love mother St. Marry. So, I would like to thank them who help me to reach this level.

I would like to acknowledge Addis Ababa University College of health sciences, school of Nursing and Midwifery for offering me such an opportunity to undertake this thesis paper.

I would like to express gratitude to my principal advisor Dr. Erdaw Tachbele (Ph.D.) and my co-advisor Mr. Kerebih Abere (MSc), for their kind help, constructive comment, consistent encouragement, continual guidance, and valuable assistance throughout the research.

I would like to thank all study participants, data collectors, and all staff in the study sites who gave their time.

Finally, my thanks also go to Mis. Habtamnesh Dereje and S/r Serkie Wale for their undeserved support throughout the year.

ACRONYMS

ANC - Antenatal Care

AOR - Adjusted odds ratio

CI - Confidence Interval

EDHS - Ethiopia demographic and health survey

HBsAg - Hepatitis B Surface Antigen

HBV - Hepatitis B virus

HIV - Human immunodeficiency virus

IRB - Institutional Review Board

MTCT - Mother to child transmission

OR - Odds Ratio

SPSS - Statistical Package Social Sciences

STIs - Sexually transmitted infections

WHO - World Health Organization

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ABSTRACT

Introduction: Human immunodeficiency virus, hepatitis B virus, and syphilis infections are a widespread problem among pregnant women around the world, with difficulties that are passed on to their newborn babies. In Ethiopia, STIs such as syphilis, HBV, and HIV are major public health issues that result in a wide range of adverse pregnancy outcomes.

Objective: The study aimed to determine the seroprevalence and associated factors of the human immunodeficiency virus, hepatitis B virus, and Syphilis infection and associated factors among pregnant mothers attending antenatal clinics at governmental hospitals in Addis Ababa, Ethiopia, 2021.

Method: An Institutional based cross-sectional study design was employed among 281 mothers from February to March 2021. Systematic random sampling technique was employed to select the study participants and socio-demographic data, hospital-related factors, and risky socio-cultural and behavioral factors were collected by face-to-face interview using a structured questionnaire. Seroprevalence of HIV, HBV, and Syphilis was taken from the routinely prescribed laboratory test results of the pregnant mothers. Data was entered into Epi-data 3.1, and SPSS version 25.0 was used to modify, clean, and analyze it. Descriptive statistics, bivariate and multivariable logistic regression analysis were used. Variables with a P-value of < 0.05 were considered determinant factors for HIV, hepatitis B virus, and syphilis infection.

Result: Human immunodeficiency virus, hepatitis B virus, and syphilis seroprevalence were 5.3%, 3.2 %, and 1.8% respectively. STIs (HIV, HBV, and Syphilis) were found in 26 (9.3%) of the women, and 1.1% of the women had both HIV and syphilis co-infections. There were no HIV/HBV, HBV/Syphilis and HIV/HBV/Syphilis co-infection. The history of multiple sexual partners (AOR 3.42, 955 CI 1.0-11.63) and history of STIs (AOR 3.7; 955CI 1.07-13.45) were significantly associated to HIV infection. Likewise, history of abortion (AOR 7.65, 95% CI 1.17-49.74), tattooing (AOR 9.72, 95% CI 1.41-66.73) and involuntary sex (AOR 9.72, 95% CI 1.41-66.73) were significantly associate with hepatitis B virus infection. Husband history of multiple sexual partner (AOR 20.9, 95% CI 1.8-241.8) was significantly associate with syphilis infection.

Conclusion and recommendation: There are still a high prevalence of human immunodeficiency virus, hepatitis B virus, and syphilis in our country Ethiopia. Therefore, it is important to screen these infections among all pregnant women at every antenatal care visit.

Keywords: Seroprevalence, HIV, HBV, and Syphilis, risk factors, Ethiopia

1. INTRODUCTION

1.1. Background

Sexually transmitted infections (STIs) are a group of communicable illnesses that are caused by pathogens and can be procured and transmitted through unprotected sexual intercourse, via blood, and from mother to child during (MTC)during pregnancy and delivery(1). They are among the major causes of illnesses throughout the world, particularly in low-income countries(1). Immunologic changes amid pregnancy may initiate a state of expanded vulnerability to certain intracellular germs counting infections, intracellular microbes, and parasites. Concerning these viral diseases in pregnancy are a major cause of dreariness and death for both mother and newborn. The global burden of HIV, HBV, and syphilis illnesses is a widespread issue among pregnant women, with difficulties that are passed down to their newborn children (2).

Hepatitis B is a systemic infection that mostly affects the liver and belongs to the hepadnaviridae family and genus orthohepadnavirus. It's a virion with a circular DNA genome that's partially double-stranded(3). HBV is profoundly infectious and generally simple to be transmitted from one tainted person to another. It can be transmitted by transfusion of blood, infected blood and blood products, urine, semen, sweat, saliva, tears, breast milk, vaginal secretions, and pathological effusions. Depending on the epidemiological design inside a geographic region, the most ways of transmission are sexually intercut, and parental transmission of the child at birth from a tainted mother, from an infected household contact to an infant, and about 600,000 deaths a year are ascribed to HBV-related liver disease and hepatocellular carcinoma worldwide (3).

Hepatitis B infection that persists during pregnancy is a serious and unavoidable problem that poses unique obstacles. However, unlike the general population, pregnant women with chronic hepatitis B infection must evaluate a number of unique challenges, such as the impact of HBV disease on the mother and baby, the impact of pregnancy on HBV replication, and the effects of antiviral therapy(4).

Generally, the transmission of hepatitis b infection from contaminated moms to their fetuses or newborns, either in utero or per partum remains a major source of proceeding the store of chronically contaminated people. Universal screening for HBV disease amid pregnancy has been

suggested for many years, and recognition of pregnant ladies with chronic HBV disease through all-inclusive screening has had a major impact in decreasing the risk of neonatal infection(5).

Syphilis could be a persistent irresistible disease caused by the Spirochaete, *Treponema pallidum* which is a slender spiral measuring about 5-15 μm in length 0.25 μm in diameter. It causes ulcerative genital injury that upgrades the securing and sexual transmission of HIV contamination(3, 6).

A pregnant mother with syphilis can transmit the infection (*T. pallidum*) to the fetus through the placenta beginning in the 10th-15th weeks of gestation which results in fetal death, miscarriages, and stillbirth(3). Others are born alive but develop the signs of inherent syphilis in childhood, including lymph node enlargement, skin rash, Hutchinson's teeth, saddle nose, periostitis, inflammation of the cornea which can lead to corneal scarring, and potential blindness, and a variety of central nervous system anomalies; therefore adequate treatment of the mother during pregnancy prevents congenital syphilis(3).

In 2018 an estimated 0.8% of pregnant women, and in the African region 2.0 % of pregnant women are tainted with syphilis, speaking to more than 900,000 pregnancies at risk each year(7). In sub-Saharan Africa, the pooled predominance of syphilis between pregnant ladies was 2.9%(8).

1.2. Statement of the problem

Sexually transmitted infections like; HIV, hepatitis B infection, and syphilis remain the main public health problems worldwide, especially in low-income countries where access to adequate diagnostic and treatment facilities is insufficient(2). In most studies, marital status, multiple sexual practices, having had nose/ear piercings, a history of blood transfusion remained a significant factor in acquiring STIs(9, 10). Besides, the rate of transmission increases if the mother is seropositive of these STIs. Furthermore, these STIs do pose a risk not only to the mother and her newborn but also to the sexual partners and health workers as well, and horizontal transmission between children, particularly siblings. They have severe effect on pregnancy that result in poor pregnancy outcomes like neonatal death, intrauterine growth restriction, neonatal asphyxia (4).

The burden of morbidity and mortality worldwide from sexually transmitted pathogens compromises the quality of life, sexual health, reproductive health, as well as infant and child health(6). HIV has been spreading at an alarming rate. In 2019, there were 38 million people living with HIV worldwide, with 17.8 million of them being females over the age of 15, and 690,000 people dying from AIDS-related illnesses. Around 5500 young women between the ages of 15 and 24 get infected with HIV every week. In SSA, women account for five out of every six infections among those aged 15 to 19. Pregnant women accounted for approximately 48% of all new HIV infections and approximately half (52%) of all individuals living with HIV worldwide and the infection is the leading cause of death among women of reproductive age(6, 11).

In Ethiopia, about 768,000 people are living with HIV and about 39,00 were new infections(12). HIV has adverse pregnancy outcomes on pregnant women like; intrauterine growth restriction (IUGR) (20.5%), pre-term birth (25.0%), and cesarean delivery (45.5%)(13). Besides, without any intervention, transmission rates of HIV from mother to child range from 15% to 45%. On the other hand, HIV-infected and untreated children are at the highest risk of mortality within the first 3 months of life, and up to 50% die within 2 years(13).

Globally, perinatal hepatitis b virus spread accounts for an estimated 21% of HBV-related child deaths, whereas territorially it ranges from 13% within the Eastern Mediterranean region to 26% within the Western Pacific region(5). Africa has the moment biggest number of confirmed carriers after Asia and is considered as a region of high endemicity, despite the reality that the precise burden of hepatitis b virus in Africa is difficult to assess due to inaccurate records and under-

reporting(14). It is assessed that between 70 and 95% of the adult population show evidence of past exposure to HBV infection and the prevalence of HBV disease among pregnant ladies ranges from 1.6% to 13.8%(14).

In Ethiopia, the HBV virus is becoming an emerging public health concern. A recent precise audit of all sorts of viral hepatitis in Ethiopia concluded that the predominance of HBV among the populace is 7.4%(15). This finding placed Ethiopia under the region of intermediate endemicity according to WHO regions for HBV, low < 2%, an intermediate 2%–8%, and high > 8% population prevalence of chronic HBV infection(15, 16).

Syphilis is still it is a global health problem despite widely available methods of screenings and treatments. Globally an estimated 0.8% of pregnant women and in the African region, 2.0 % (0.1–7.6%) of pregnant women are contaminated with syphilis, speaking to more than 900,000 pregnancies at hazard each year(7). Untreated syphilis leads to an increment within the hazard of mother-to-child transmission (MTCT) of HIV. It has unfavorable pregnancy results, such as abortion, intrauterine fetal death, stillbirth, growth restriction, low birth weight, neonatal death, and congenital syphilis, due to untreated STIs(7).

Worldwide, STIs constitute tremendous wellbeing and financial burden, especially for sub-Saharan countries where they account for 17% of economic disasters caused by ill-health. The costs increment advance when the cofactor impact of other sexually transmitted contaminations on HIV transmission is taken into consideration(8, 17, 18).

Recent documented data and co-infection rate of all these infections are not well studied especially in the study setting(19). Diagnosing and treating these devastating etiologic agents at an early stage may result in preventing the spread of such infections and complications, for pregnant women as well as for their newborn infants. In this way, getting periodical estimates of the nearby epidemiological picture of these diseases is basic for directing clinical activity, asset allocation, and intervention protocols to form advance toward elimination. Therefore, this study was aimed to provide reports on the seroprevalence of human immunodeficiency virus, hepatitis b virus, and syphilis infections, also their risk factors among pregnant women in Addis Ababa, Ethiopia.

1.3. Significance of the study

The result of this study will help stakeholders and the local governmental organizations to know up-to-date information regarding the seroprevalence and associated factors of human immune deficiency virus, hepatitis b virus, and Syphilis. The result of this study will help to plan specific strategies for reducing both maternal and neonatal illness and death due to these infections in the catchment area. It will moreover offer assistance to set fitting care arrange and screening methodologies for human immune deficiency virus, hepatitis b virus, and syphilis infections to decrease poor neonatal outcomes. Besides, it will serve as a reference for other researchers who want to investigate further study in the area.

2. LITERATURE REVIEW

2.1.Introduction

Sexually transmitted infections (Like HIV, HBV and Syphilis) are a group of communicable diseases that are caused by pathogens and can be procured and transmitted through unprotected sexual intercourse, via blood, and from mother to child during pregnancy and delivery. In most studies, marital status, multiple sexual practices, having had nose/ear piercings, history of sexually transmitted infections, a history of blood transfusion remained a significant risk factors in acquiring these STIs.

2.2. Seroprevalence of HIV, hepatitis b virus, and Syphilis infections

Human immunodeficiency virus, hepatitis b virus, and syphilis infections occur all over the world. In China prevalence of HIV among pregnant mothers was 6.6%(20). In Cameroon, the overall prevalence of HIV among pregnant women was 5.0%(21). Recent HIV prevalence trends among pregnant women in sub-Saharan African countries presented that the pooled prevalence of HIV among pregnant women was 5.3%(22). A meta-analysis and systematic review in Ethiopia showed that the pooled prevalence of HIV among pregnant mothers was 5.74% (23). A similar study in Dessie, the prevalence of human immunodeficiency virus amongst pregnant mothers was 6.5% (24).

HBV is highly endemic in areas, like Sub-Saharan Africa, South east Asia, central Asia, and the Amazon basin, that its carrier rate above 8%. In low endemic districts, just like the United States, Northern Europe, Australia, and South America, HBsAg predominance is less than 2%. The Middle East, Eastern European countries, and the Mediterranean basin are considered areas of intermediate endemicity with a carrier rate between 2% and 8%(4, 15, 25).

Hepatitis B virus infection is transmitted from a carrier mother to their babies during the perinatal period and appears to be the most important factor in determining the prevalence of the contamination in high endemicity regions, especially in China and Southeast Asia. Epidemiological considers on HBV intrauterine contamination in China appeared that intrauterine contamination happens in 3.7-9.9% of pregnant ladies with positive HBsAg and Asia 9.8- 17.39% of pregnant ladies with positive HBsAg(15).

In other African countries, some institution based seroprevalence studies of HBV among pregnant mothers in Kenya, Egypt, Tanzania, Kano Nigeria, Ghana, Sudan, Angola, and the Solomon

Islands presented that the prevalence of HBsAg was 3.8%, 1.6%, 3.9%, 7.9%, 9.5%, 2.93%, 7.5%, 13.8% respectively(5, 26-32). Likewise, in Ethiopia, some institution-based studies on seroprevalence of HBsAg at Deder hospital, Dawro zone, Bahir Dar, Arba Minch, Dessie, Yirgalem, and Southern Ethiopia have shown the general predominance of HBV disease among pregnant mothers who attend ANC is 6.9%, 3.5 %, 3.8%, 4.3%, 4.7%, 7.2%, and 7.8% respectively(8, 33-38).

In Cameron, syphilis prevalence was 5.7%(21). In Sub-Saharan African countries, the pooled incidence of syphilis among pregnant ladies was 2.9%. East and Southern African regions had a higher syphilis prevalence among pregnant women 3.2% and 3.6% respectively than the sub-Saharan African pooled prevalence (2.9%) (8). Another institution-based study in Dessie, Northeast Ethiopia, and Bahir Dar showed that the prevalence of syphilis was 0.8%and 2.6% respectively(24, 39).

2.3. Factors associated with HIV, HBV, and Syphilis infections

2.3.1. Socio-demographic factors

Socio-demographic and economic factors like educational level, residence, marital status, age, gravidity, occupation, and income were considered in most studies to see their association with HIV, HBV, and syphilis infections as follows.

In China ethnicity, and a spouse who utilized drugs were essentially associated with HIV risk in pregnant women. Pregnant mothers had a higher risk of HIV infection when they were over 30 years old, had a higher number of previous births, their husbands had a history of migrating for work, and had a history of other sexually transmitted diseases (20). It is also presented that compared to those with a primary school education or below, pregnant ladies with a secondary or high school education level had a lower threat of HIV contamination (20).

A study done in Cameron showed that factors that were associated with HIV infection included marital status, women who were married or living with their partner are less likely to be tainted than singles ladies, multiparity, and age (40).

Human immunodeficiency virus infection (HIV) is significantly correlated with the employment status which is the odds of HIV were almost two times among employees of the informal sector compared to housewives (40). Education level was also significantly related to HIV infection, women who reported having achieved primary school education, and secondary school education had higher predominance as associated to those who detailed never having gone to school. In this

study HIV infection increase with age group which was more than three times among women age above 20 years as compared with those aged less than 20 years, and multiparous ladies are nearly three times more at the hazard of disease than nulliparous ladies, and the chances of the disease are indeed higher among grand multiparty (40).

Another study conducted in sub-Saharan African countries revealed that HIV prevalence was decreased significantly among women aged 15-24 years while increasing significantly among women 35-49 years, who represented 29% of women but only 15% of pregnant women(22).

Another study conducted in Angola showed that HIV prevalence was exacerbated by low education, low access to health care, unemployment, older-aged, and urban residence and multivariate analysis showed a significant protective factor from HIV-infection in pregnant women younger aged than 25 years ($P < .05$)(30).

In Ethiopia institution-based studies in Gondar showed that seroprevalence of HIV was associated with marital status and occupation was associated with HIV infection(18), but in Dessie, even if the most noteworthy predominance of HIV infection was observed in the age group of 20-29 years, HIV has no statistical significance with the age of participants(24).

In African studies conducted among pregnant mothers, in Sudan(41), Ghana(42), and Tanzania(43) showed that age was not significantly associated with positive Hepatitis B infection rates, but in Kenya(44), early age was significantly associated with HBsAg positivity($p=0.05$)(42). Another study conducted by Honiara Solomon Islands presented that there was no statistically significant difference in HBsAg prevalence with the level of education(26). In Ethiopia, institutional-based studies among pregnant mother attend antenatal clinic shows that at Dessie Referral Hospital the seroprevalence of hepatitis b virus infection was significantly higher among pregnant mothers who had no formal education ($P = 0.001$)(45), but at Deder hospital, Arba Minch Hospital, and Yirgalem Hospital, educational level was not was essentially related with HBsAg seropositivity(35, 36, 38).

Concerning the marital status of the pregnant ladies a consider conducted in Tanzania(43), Ghana(42) uncovered that, that there was no noteworthy factual affiliation between HBsAg inspiration and marital status ($P>0.05$), be that as it may, in Ghana the most noteworthy predominance of 3.5% was found among the single ladies ($P>0.05$), however, in Ghana the highest prevalence of 3.5% was found among a single woman (42). In Ethiopia, institutional-based studies conducted among pregnant mothers who attend ANC, at Deder hospital, Arbaminch hospital, and

Yirgalem Hospital revealed that the conjugal status of the mother was not significantly associated with seropositivity of HBV(35, 36, 38).

Regarding gravidity Dar es Salaam Tanzania(43), Ghana(42) indicated that there was no direct association between gravidity of the mother and risks of acquiring HBV infection, however, in Ghana the most noteworthy predominance of 3.7% was found among HBsAg positive moms in their first-time pregnancy(42). In Ethiopia, some institution-based studies conducted at Deder, Arbaminch, and Yirgalem hospitals similarly show that there was no association between parity and risks of HBV(35, 36, 38).

Regarding the occupation of pregnant women, in Kenya, and Ghana, no significant relationship was observed between HBV infection and occupation(42, 44). Similarly in Ethiopia, studies conducted in Deder hospital(35), Yirgalem hospital(38), and Arbaminch hospital(36) shown that there was no statistically significant association between occupation and risk of HBV infection.

A study conducted in North Kordofan, Sudan showed that there is no significant association between syphilis and sociodemographic characteristics like age, gravidity, parity, and marital status(29). Similarly, in Ethiopia, an institution-based study conducted in Dessie showed that syphilis was not significantly associated with age(24). In contrast, an institution-based study in Gondar showed that age was essentially related with syphilis disease and the risk for syphilis infection was higher and positively associated among women aged 20–29 a long time, ladies matured ≥ 30 a long time (46).

Regarding marital status and residence, an institution-based study in Bahir Dar showed that syphilis infection was ($p = 0.002$) higher in separated ladies than in hitched ladies, and the probability of syphilis was nearly three times higher among rustic inhabitants compared to urban inhabitants ($p = 0.079$)(39).

2.3.2. Risky socio-cultural and behavioral factors

Risky socio-cultural and behavioral factors like tattooing, multiple sexual partners, unprotected sex, ear/nose piercing, and alcohol abuse were considered in most studies to see their association with HIV, HBV, and syphilis infections as follows.

In Cameroon(47) having had two or more sexual partners, likewise in Nigeria(48) multiple sexual partners were essentially related with HIV disease. A similar study in Uganda(9) revealed that a higher number of sexual partners in pregnancy is associated with HIV infection. An institution-

based study in Dessie referral hospital, Northeast Ethiopia moreover appeared that numerous partners were essentially associated with HIV infection (24).

Regarding tattooing, a Nigerian study showed that tattoo/scarification mark was statistically significant predictors of HIV infection(48). Whereas in Cameroon(48), Turkey(49), and Uganda(9) tattooing was not associated with HIV infection.

In Cameroon, there is no significant relationship between hepatitis B virus infection and tattooing (47). Whereas a study in Turkey(49) history of tattooing was meaningfully related to the risk of HBV infection. Similarly, in Ethiopia an intuition-based consider done among pregnant moms at Bahir Dar uncovered that body inking was essentially related to HBV(39).

Regarding ear/nose piercing, in Nigeria ear piercing was not a significant risk factor for hepatitis b virus infection (48). Whereas at Dre Dawa having nose/ear pierce, was significantly associated with hepatitis b virus infection (10), at Dessie hospital in multivariate analysis, hepatitis b virus infection was significantly higher among nose piercing (24), and at Deder hospital nose piercing, was a significant predictor of HBV infection(35).

Concerning risky behavioral practices, the sexual behavior of the individual can determine the risk of HBV infection. Studies conducted among Ethiopian pregnant women in different areas show the association of multiple sexual partners and hepatitis b virus infection. For example, at Yirgalem, Dese, and Deder hospitals Ladies with a history of numerous sexual accomplices were essentially related to HBsAg positivity (24, 35, 38).

Another risky behavioral factor that increases the occurrence of hepatitis b virus infection was a history of abortion, for instance, in Nigeria shown mothers who have a history of abortion were a significant risk factor for HBV infection(48). Another study done in Deder hospital Ethiopia among pregnant women revealed that history of abortion was a significant predictor of HBV infection(35).

A study was done in Ekiti State, South-Western Nigeria, having a new sex partner in the last 6 months and those involuntary/forced to sex in the past one year are significant risk factors for syphilis infection (50).

A study done in Gondar referral hospital showed that an experience of miscarriage and history of stillbirth was associated with syphilis infection (18). Similarly, an institution-based study in Bahir Dar's Felegehiwot referral hospital found a link between multiple sexual partners and syphilis infection (39). The hazard of syphilis was more prominent in ladies with a history of preterm

birth(39). Another study in Yirgalem appeared that in multivariate calculated relapse examination, ladies with HIV disease were altogether more likely to be syphilis-seropositive as compared to HIV negatives. However, multiple sexual partners were not statistically significant(51).

2.3.3. Hospital related factors

In most studies, hospital-related factors like history of hospitalization, blood transfusion, surgery, and dental procedure were not significantly associated with HIV and syphilis infection, but they are significantly associated with Hepatitis b infection discussed as follows.

A study done in Egypt showed hospital admission was a factor for acquiring HBV infection (52). Regarding blood transfusion a study conducted in Turkey shown that a significant association was observed between HBV infection and history of blood transfusion (49). Another study was done in Dire Dawa, Ethiopia also shown that a history of blood transfusion was meaningfully related to HBV infection(10). Whereas studies conducted in Tanzania(43) and Ghana(42) showed that HBV infection was not related to blood transfusion.

Other hospital-related factors that can be responsible for the transmission of most microbial infections were minor or major surgery and dental extraction. Regarding the surgical procedure, a study was done to find the incidence of Hepatitis b virus infection in Egyptian and Lagos Nigeria revealed that surgeries were the risk factors for acquiring the infection (48, 52). Whereas in Iran no significant relationship was observed between HBV infection, and history of surgery (53). Regarding dental procedure and HBV infection a study done in Ghana identified the HBV was not associated with any of the risk factors including dental procedure (42). But a study done in Nigeria revealed Seroprevalence of HBsAg was more in pregnant women, with a history of dental procedures (34.0%) and tooth extraction as a risk for maternal infection of HBV(48).

2.4. Conceptual framework

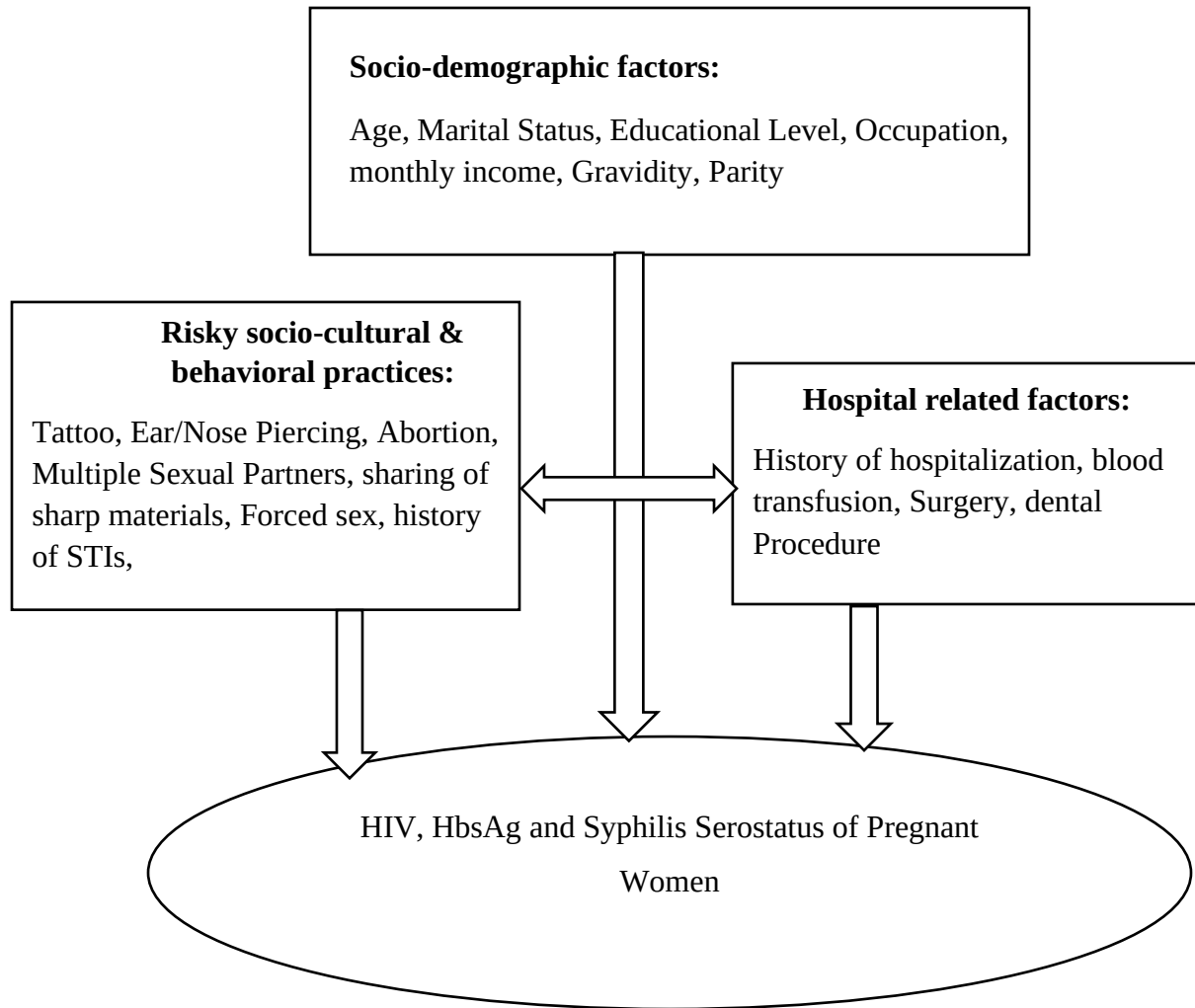


Figure 1:- Conceptual framework showing the relationship between the outcome and independent variables (adapted from (24)).

3. OBJECTIVES

3.1. General objective

- ✚ To determine the seroprevalence of HIV, HBV, and Syphilis infections, as well as associated factors, among pregnant women attending antenatal clinics at governmental hospitals in Addis Ababa, Ethiopia, in 2021.

3.2. Specific objectives

- ✚ To assess the prevalence of HIV, HBsAg, and Syphilis among pregnant women attending antenatal clinics at governmental hospitals in Addis Ababa, Ethiopia.
- ✚ To identify factors associated with HIV, HBsAg, and Syphilis among pregnant women attending antenatal clinics at governmental hospitals in Addis Ababa, Ethiopia.
- ✚ To assess co-infection rate of HIV, HBsAg, and Syphilis among pregnant women attending antenatal clinics at governmental hospitals in Addis Ababa, Ethiopia.

4. METHODS AND MATERIALS

4.1. Study area

The study was conducted in Addis Ababa, Ethiopia. Addis Ababa, the capital city of the Federal Democratic Republic of Ethiopia, is located at the center of the country. The city has 10 sub-cities and 116 Woredas. There are 13 governmental hospitals in Addis Ababa, of which 6 are administered by the Addis Ababa City Organization Health Bureau, 4 by the federal ministry of health, 1 by Addis Ababa University, and 3 by Defense Constrains, and Police. The hospitals were selected by lottery method. Hence, Tikur Anbessa Specialized Hospital, Zewditu Memorial hospital, St. Peter specialized hospital, and Gandhi Memorial Hospital were selected for the current study. Tikur Anbessa specialized Hospital is the largest referral and teaching hospital in Ethiopia and is operated under the ministry of education of Ethiopia. Gandhi memorial hospital is managed under the Addis Ababa Administrative Health Office. St. Peter specialized Hospital is also another referral hospital that is administered under the federal ministry of health. Zewditu Memorial Hospital is among the six governmental referral and teaching Hospitals that are managed under the Addis Ababa Administrative Health Bureau. The study was conducted in selected public hospitals of Addis Ababa, Ethiopia from February to March 2021.

4.2. Study period

The duration of the study was from February to March 2021.

4.3 Study design

The serostatus of pregnant women who visit ANC clinics at selected hospitals was obtained from their registration card in an institution-based cross-sectional study.

4.4 Source population

All pregnant women attending ANC at public hospitals in Addis Ababa.

4.5 Study population

All pregnant women attending antenatal care at Addis Ababa government hospitals during the study period, and fulfill the inclusion criteria.

4.6. Sample size determination

The sample size was determined using a single population proportion formula by taking 6.5% the highest prevalence of HIV infection from recent study in Dessie, Northeast Ethiopia.(24). Considering the following assumptions, z = standard normal distribution value at 95% confidence level of $z\alpha/2 = 1.96$ and margin of error (d) = 3%. Finally:

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

$$d^2$$

where; n = sample size

p = prevalence (6.5%) =0.065

Z = confidence interval (95%) = 1.96

d = tolerated error=0.03

$$n = \frac{(1.96)^2 0.065(1-0.065)}{(0.03)^2}$$

$$(0.03)^2$$

$$n = \frac{(1.96)^2 0.065(0.935)}{(0.03)^2} = 259.5 \sim 260$$

$$(0.03)^2$$

By adding a 10% of non-response rate, the final sample size was 286.

4.7 Sampling technique

Systematic random sampling technique was used to identify the study subjects. From the three-month from November -January 2020 reports of each hospital indicate that the average number of pregnant women attending antenatal care in one month at Tikur Anbessa specialized hospital, Gandhi memorial hospital, Zewuditu Memorial Hospital, and St, Petros hospital was 600, 700, 300 and 250 respectively. The sampling interval was calculated by using a formula, $k=N/n$ which is, $K=1850/286=6.4$, and the initial sample was selected by using lottery method. As a result, until the calculated sample size was attained within the data collection period's time frame, every sixth pregnant woman who attends prenatal clinics was enrolled in the study.

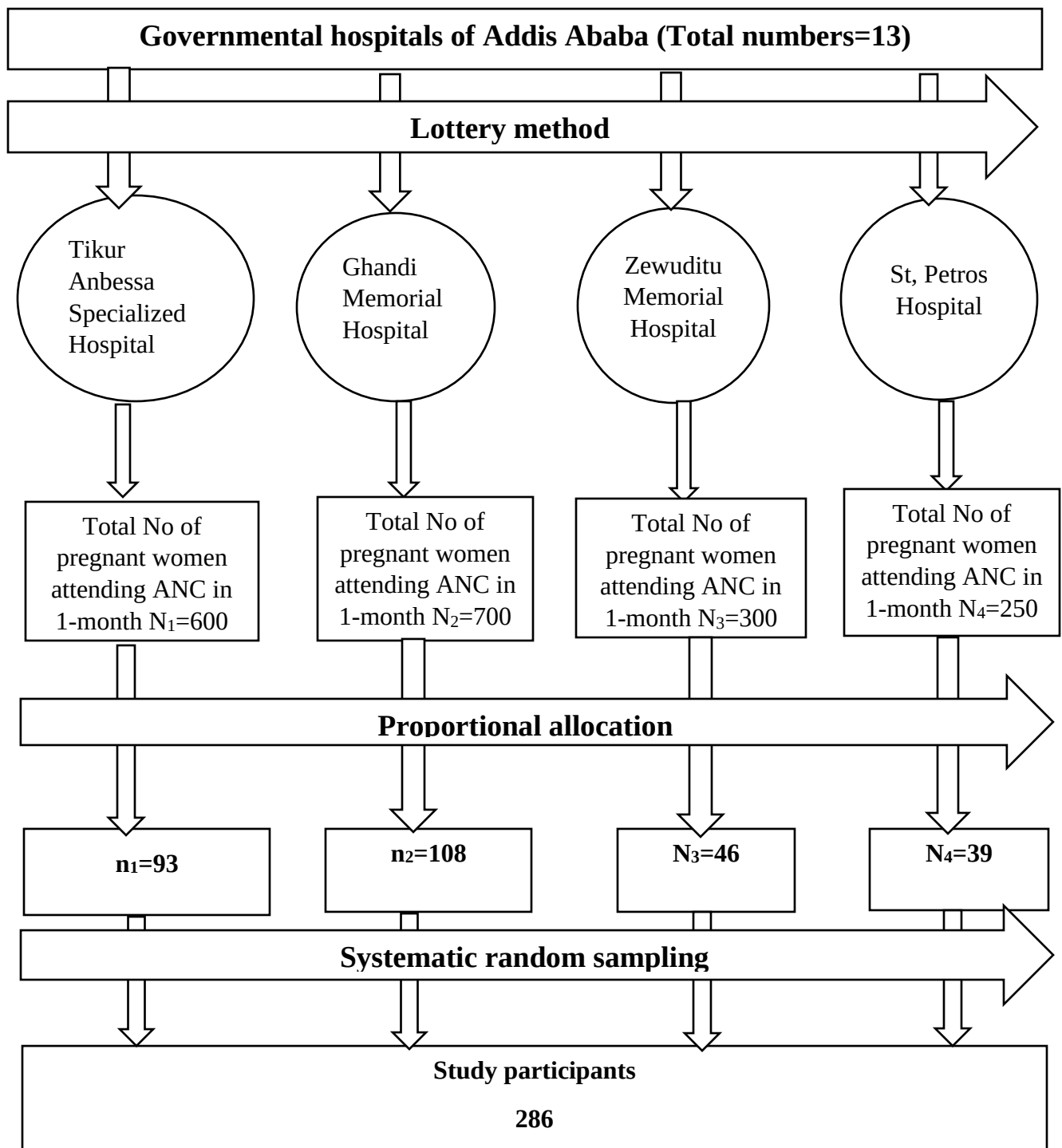


Figure 2: - Diagrammatic presentation of the sampling procedure of pregnant women who attend antenatal care at selected hospitals of Addis Ababa, 2021.

4.8. Inclusion and Exclusion criteria

4.8.1. Inclusion criteria

Pregnant women attending ANC during the data collection period.

Pregnant women who are willing to participate in the study.

Pregnant women residing in Addis Ababa for at least 6 months.

4.8.2. Exclusion criteria

Pregnant women who have severe health problems during the data collection period were excluded.

Pregnant women whose serostatus is not known were excluded.

4.9. Data Collection Procedures

A structured questioner was given to collect information on socio-demographic information, risky socio-cultural and behavioral practices, and hospital-related factors during a face-to-face interview with a structured questioner. Seroprevalence of HIV, HBV, and syphilis was recorded from the medical record of the pregnant mother.

The data collectors were four senior BSc midwives who had experience in data collection procedures. And the supervisors were two MSc midwives who had experience in supervision. The questionnaire was standard and it has been adopted from a similar study done in Dessie, Ethiopia(24). To ensure consistency, the English version of the questionnaire was translated into the local language Amharic. After a brief explanation about the aim of the study, the participants were invited to take part in the study voluntarily. HIV, HBV, and Syphilis are routine laboratory tests performed for all pregnant women without any payment during antenatal follow-up. So, HIV, HBV, and Syphilis serostatus of the women were easily addressed from their card after written consent and interview.

4.10. Study variables

4.10.1. Dependent variable

- HIV, HBsAg, and Syphilis serostatus

4.10.2. Independent variables

- **Socio-demographic factors**

- Age
- Gravidity
- Parity

- Marital status
- Educational level
- Occupational level
- Monthly income
- **Hospital related factors:**
 - Blood transfusion
 - History of dental procedure
 - History of surgical procedure
 - History of Hospitalization
- **Risky socio-cultural & behavioral practices:**
 - Tattooing
 - History of abortion
 - Ear/Nose Piercing
 - Multiple Sexual Partners
 - Sharing of sharp materials
 - Premarital sex
 - Forced/involuntary sex
 - History of STIs

4.11. Operational Definition

History of hospitalization: -refers to the history of hospital admission of the study subject for any disease in the past.

Blood transfusion history: - indicates the transfusion history of the study subjects for any issue.

History of surgical procedures: -refers to any surgical procedures minor or major practiced on the study subject in the past.

Risky Socio-cultural factors: -refers to some of the social and cultural activities that were practiced by the study subject and able to serve as a means of exchange of body fluids and germs between individuals for example ear or nose piercing, sharing of sharp instruments, contact with a family member during visiting and caring of the sick in the past.

Risky behavioral factors: -refers to some of the behavioral malpractice of the subjects that exposed them to the risk of acquiring HBV infection from different sources like abortion, and risky alcohol consumption in the past.

4.12. Data analysis and Interpretation

After checking for completeness and consistency of the collected information, the data was cleaned, coded, and entered into Epi-Data 3.1, and transferred to statistical package social sciences (SPSS) version 25 for analysis. The descriptive statistics (means, percentages, or frequency) were calculated and the bi-variant logistic regression analysis was used to see the relationship between dependent and independent variables. Variables having a p-value of ≤ 0.25 in bivariate analysis were considered to have an association with the dependent variable and entered into multivariate analysis. The strength of the association was measured using an odds ratio and interpreted by considering the 95% confidence interval, and $p < 0.05$ were statistically significant risk factors in multivariate analysis. Finally, the results were presented using texts, charts, and tables.

4.13. Data quality control

The questionnaire was standard and prepared first in English by the investigator and then translated to Amharic by an individual who had a good ability of both languages. The Amharic version questionnaire was used for data collectors. To maintain data quality, training was given to data collectors and supervisors. The selected and trained supervisors were supervising the data collectors on daily basis for completeness and consistency of the filled questionnaires. Also, the data was thoroughly cleaned and carefully entered into a computer for the beginning of the Analysis.

4.14. Pre-test

A pretest was done in 5% (14) of the study subjects at Yekatit 12 Hospital before the actual data collection time that was not included in the study. For this investigator, supervisors, and data collectors took a part in a pre-test of the survey questionnaire among the study subjects in another hospital which is not selected in the study.

4.15. Ethical consideration

The School of Nursing and Midwifery's Research Ethics Review Committee (RERC) granted ethical approval. The participants were informed about the purposes of the study. Confidentiality and Privacy of participants during the data collection procedure were assured by written consent and explaining the objective of the study. An official letter was gotten from the Addis Ababa health bureau research directorate. A letter of ethical clearance, as well as a letter of cooperation, was sent for the study hospitals to undertake the data collection.

4.16. Dissemination of results

The final report of the study will be presented to Addis Ababa University College of Health Science School of Nursing and Midwifery, different public hospitals, and responsible bodies. Finally, possible efforts will be made to publish the result in national and international peer-reviewed journals.

5. RESULTS

5.1. Sociodemographic characteristics of study participants

The study comprised a total of 286 pregnant women, with a response rate of 98.2 percent. The mean age and standard deviation of the study participants was 27.5 ± 4.64 ranged from 19-43 years. The majority 197 (70.1%) of them were between 20 and 29 years old. Most of the study participants were married, 256(91.1%), 116(41.3%) attend secondary school. Among the study participants, 116(41.3%) were government employed, 161(57.3%) of them were multiparous, and 120(42.7%) of them were multigravidas (Table 1).

Table 1: Sociodemographic features of pregnant mothers visiting ANC at selected public hospitals in Addis Ababa, February 8 to March 8, 2021 (n=281)

Characteristics	Frequency	Percentage
Age		
<20	2	0.7
20-29	197	70.1
30-39	77	27.4
40-49	5	1.8
Marital status		
Single	25	8.9
Married	256	91.1
Educational level		
No formal education	34	12.1
Primary school	55	19.6
Secondary school	116	41.3
Above the secondary	76	27
Occupation		
Employed	116	41.3
Unemployed	102	36.3
Farmer	5	1.8
Private	58	20.6
Monthly income		
<500	1	0.4
500-1000	4	1.4
>1000	208	74
Gravidity		
Primigravida	24	8.5
Multigravida	257	91.5
Parity		
Primiparous	121	43.1
Multiparous	160	56.9

5.2. Seroprevalence of HIV, HBV, and Syphilis infections

HIV, HBV, and Syphilis were found to be prevalent in (5.3%), (3.9%), and (1.8%) of the study participants, respectively. 1.1% of these had HIV/Syphilis co-infection. There was no with HIV/HBV, HBV/Syphilis, and HIV/HBV/Syphilis co-infections. (Figure 3).

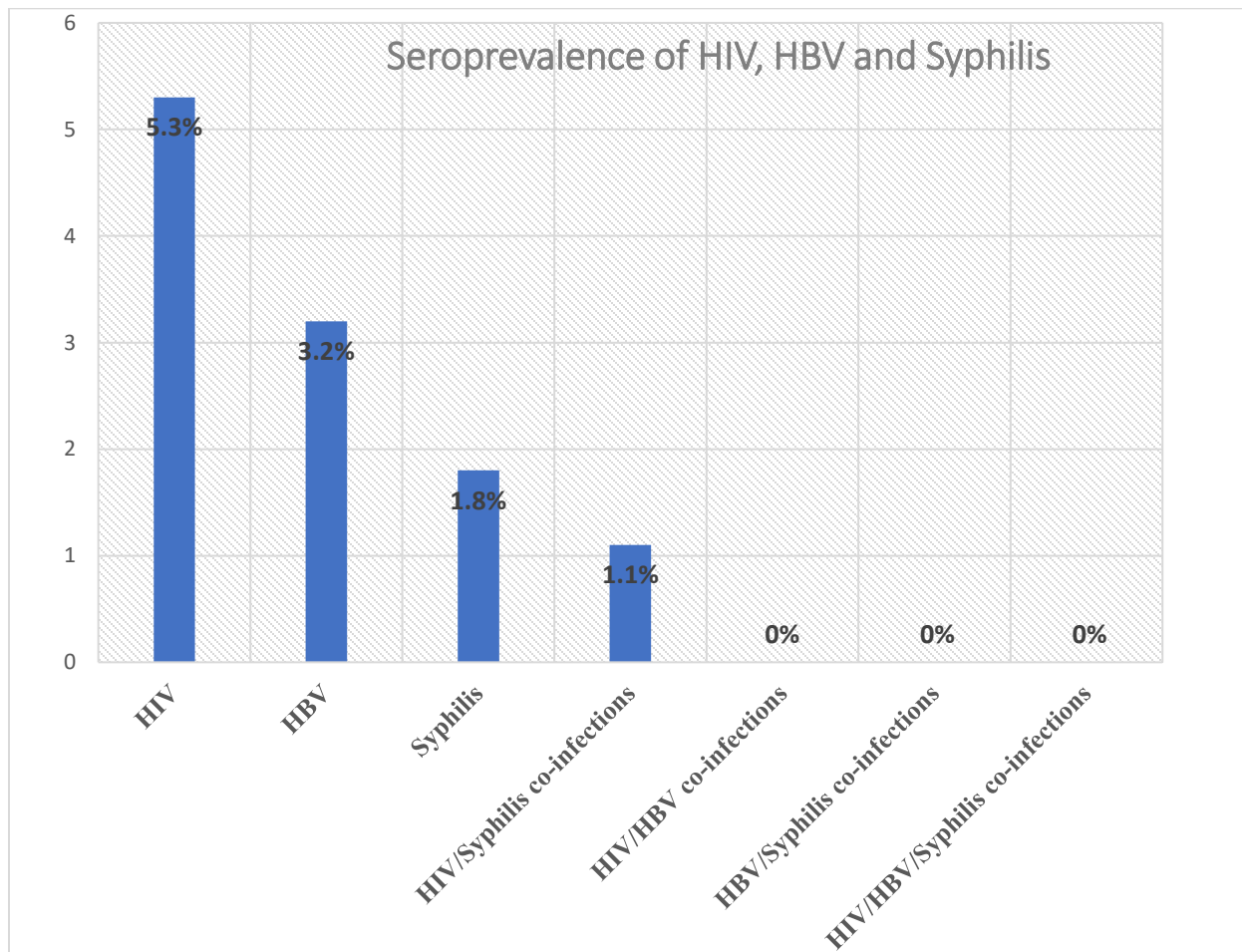


Figure 3: Seroprevalence of HIV, HBV, and Syphilis infections among pregnant women attending ANC at selected public hospitals of Addis Ababa, February 8 to March 8, 2021. (n=281)

5.3. Overall prevalence of all STIs (HIV, HBV, and Syphilis)

Among 281 pregnant women, 26 (9.3%) of them had any STIs (HIV, HBV, and Syphilis) infections. (Figure 4)

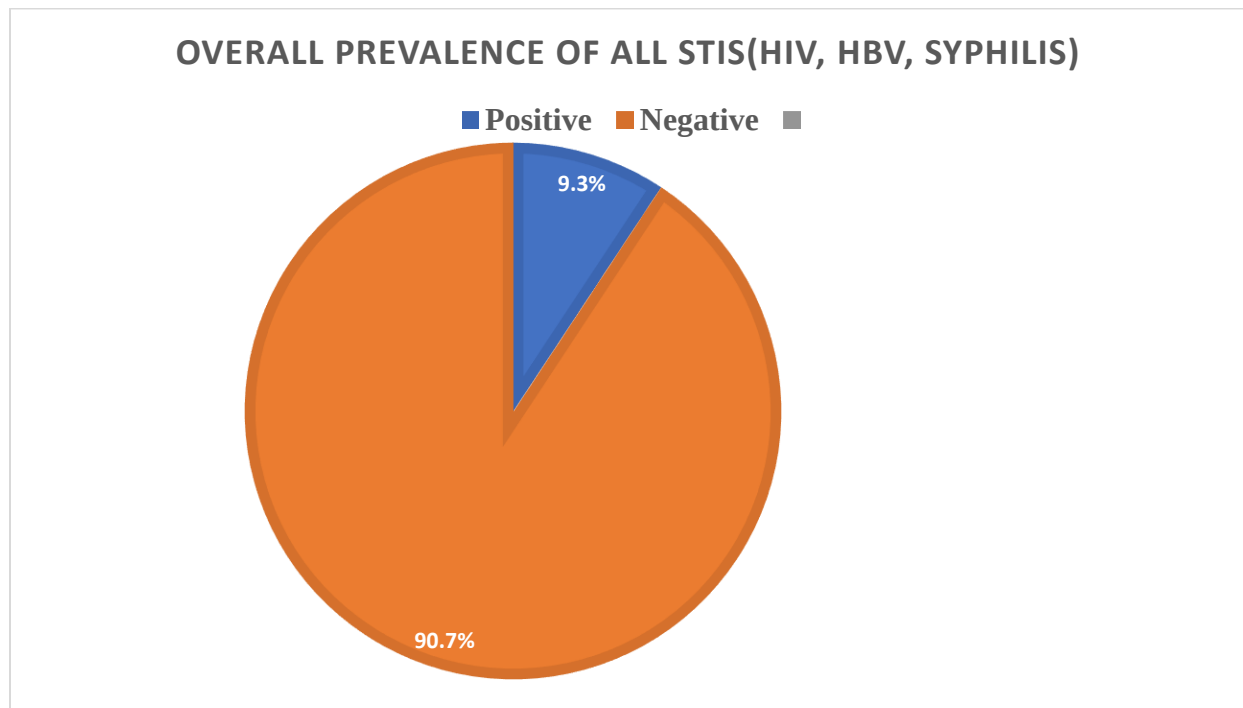


Figure 4: Overall prevalence of any STIs (HIV, HBV and Syphilis) infections among pregnant women attending ANC at selected public hospitals of Addis Ababa, February 8 to March 8, 2021. (n=281)

5.4. Hospital related factors among pregnant women

Among the study participants, 29.9% of them have a history of hospital admission, 29.9% have history of operation for a surgical procedure, and 80.8% of them have no history of blood transfusion. (Table 2)

Table 2: Hospital related factors among pregnant women attending ANC at selected public hospitals of Addis Ababa, February 8 to March 8, 2021 (n=281)

Variables		Frequency	Percent
History of hospital admission	No	197	70.1
	Yes	84	29.9
History of dental procedure	No	220	78.3
	Yes	61	21.7
History of operation for a surgical problem	No	197	29.9
	Yes	84	19.2
History of blood transfusion	No	227	80.8
	Yes	54	70.1

5.5. Risky socio-cultural and behavioral factors among pregnant women

Among the study participants, 38.4% had a history of sexually transmitted infections, 65.1% have a history of premarital sex, majority 94.7% of them have had ear piercing, and 35.9% of them have history of multiple sexual partners. (Table 3)

Table 3: Risky socio-cultural and behavioral factors among pregnant women attending ANC at selected public hospitals of Addis Ababa, February 8 to March 8, 2021 (n=281)

Variables		Frequency	Percent
History of women STIs	No	175	62.3
	Yes	108	38.4
History of partner STIs	No	187	66.5
	Yes	94	33.5
History of abortion	No	235	83.6
	Yes	46	16.4
History of tattooing	No	244	86.8
	Yes	37	13.2
History of ear piercing	No	15	5.3
	Yes	266	94.7
History of nose piercing	No	267	95
	Yes	14	5
History of premarital sex	No	98	34.9
	Yes	183	65.1
Having use sharp instruments together with others	No	172	61.2
	Yes	109	38.8
History of involuntary/forced sex	No	212	75.4
	Yes	69	24.6
History of women multiple sexual partner	No	180	64.1
	Yes	101	35.9
History of husband multiple sexual partner	No	220	78.3
	Yes	61	21.7

5.6. Seroprevalence and associated risk factors of HIV, HBV, and Syphilis

To determine the relationship between each independent variable and HIV, HBV, and syphilis serostatus, binary logistic regression was used. The components with a $p < 0.25$ were incorporated into the multivariate logistic regression model. Multivariate analysis was performed using this model to identify independent predictors of human immunodeficiency virus, hepatitis B virus, and syphilis infections, and the results were presented as follows.

5.6.1. Seroprevalence of HIV and associated factors

The total prevalence of HIV was 5.3 percent (15/281). In bivariate logistic regression women's history of multiple sexual partners, history of husband multiple sexual partners, history of women STIs, husband history of STIs, and history of surgical operation were correlated with the seroprevalence of HIV infection ($p < 0.05$). In multivariate analysis, predictor variables with $p < 0.25$ in bivariate analysis were included.

Multivariate research demonstrated that history of women STIs and history of husband sexual partner were significantly associated factors with seroprevalence of HIV infection after correcting for confounding factors. In this study, women having a history of STIs were 3.79 times (AOR 3.79; 95% CI 1.07-13.45) more likely to be infected by HIV infection than those who did not have STIs. Likewise, Pregnant women whose husbands have a history of multiple sexual partners were 3.42 times (AOR 3.42; 95% CI 1.001-11.63) the chance to acquire HIV infection compared to their counterparts. (Table 4)

Table 4: Bivariate and multivariate logistic regression analysis of pregnant women's HIV serostatus attending ANC at selected public hospitals of Addis Ababa, February 8 to March 8, 2021. (n=281)

Variables		Frequency	HIV serostatus		Bivariate analysis	Multivariate analysis	
			No n (%)	Yes n (%)	OR (95% CI)	AOR (95% CI)	P-value
Marital status	Single	25	22(7.8)	3(1)	1	1	-
	Married	256	244(87)	12(4)	0.361(0.095-1.37)	0.56(0.10-3.18)	0.519
Occupational level							
Govern't employee		116	112(40)	4(1.4)	1	1	-
No occupation		102	95(34)	7(2)	2.07(0.588-7.291)	1.72(0.41-7.14)	0.454
Farmer		5	4(1.4)	1(0.3)	5.50(0.515-58.68)	11.58(44-191.1)	0.087
Private		85	55(19.5)	3(1.0)	1.422(0.308-6.57)	1.44(0.26-7.89)	0.668
Dental procedure	No	220	211(75)	9(3.2)	1	1	-
	Yes	61	55(19.5)	6(2.1)	2.55(0.873-7.492) *	1.53(0.42-5.52)	0.511
History of surgical procedure	No	197	190(68)	7(2.4)	1	1	
	Yes	84	76(27)	8(2.8)	2.85(1.001-8.154)	2.83(0.88-9.10)	0.080
History of blood transfusion	No	227	217(77)	10(4)	1	1	-
	Yes	54	49(17.4)	5(1.7)	2.21(0.724-6.769)	2.11(0.54-8.25)	0.281
History of Woman STIs	No	173	169(60)	4(1.4)	1	1	-
	Yes	108	97(34.5)	11(4)	4.79(1.48-15.45) *	3.7(1.07-13.45)	0.039**
History of Husband STIs	No	187	181(64)	6(2.1)	1	1	-
	Yes	94	85(30.2)	9(3.2)	3.19(1.10-9.26) *	2.07(0.63-6.71)	0.225
Hx of husband sexual partner	No	220	212(75)	8(2.8)	1	1	-
	Yes	61	54(19.2)	7(2.4)	3.435(1.193-9.89) *	3.42(1.0-11.63)	0.049**
Hx of Woman sexual partner	No	180	175(62)	5(1.7)	1	1	-
	Yes	101	91(32.3)	10(4)	3.84(1.27-11.58) *	2.20(0.66-7.31)	0.195

Keys: *In a bivariate analysis, statistically significant at $p < 0.05$.

** In multivariate analysis, statistically significant at $p < 0.05$, 1 – reference category

Hx - History, STIs - Sexually transmitted infections

5.6.2. Seroprevalence of HBV and associated factors

The seroprevalence of HBV was 3.2% (9/281). In bivariate logistic regression history of abortion, history of dental procedure, history of hospital admission, and history of tattooing were associated with seroprevalence of HBV infection ($p < 0.05$). Predictor variables with $p < 0.25$ in bivariate analysis were included in multivariate analysis. Hence, in multivariate analysis, history of tattooing, history of abortion, and history of forced sex were significantly associated with hepatitis B virus infection. Women with a history of tattooing were 11.8 times (AOR 11.88, 95% CI: 2.17-65.02) more infected with HBV than compared to those who did not have tattooing. Similarly, having history of abortion (AOR 7.65, 95% CI: 1.17-49.74), and forced sex (AOR 9.72, 95% CI: 1.41-66.73) were 7- and 9-times more likely to have infected by HBV infection than those who did not have these histories respectively. (Table 5)

Table 5: Bivariate and multivariate logistic regression analysis of pregnant women's HBV serostatus attending ANC at selected public hospitals of Addis Ababa, February 8 to March 8, 2021. (n=281)

Variables		Frequency	HBV serostatus		Bivariate analysis	Multivariate analysis	
			No n (%)	Yes n (%)	OR (95% CI)	AOR (95% CI)	P-value
History of dental procedure	No	220	217(98.6)	3(1.4)	1	1	-
	Yes	61	55(90.2)	6(9.8)	7.89(1.9-32.55) *	4.86(0.79-29.63)	0.086
History of blood transfusion	No	227	222(97.8)	5(2.2)	1	1	-
	Yes	54	50(92.6)	4(7.4)	3.55(0.92-13.7) *	1.98(0.32-12.10)	0.458
History of hospital admission	No	197	194(98.5)	3(1.5)	1	1	-
	Yes	84	78(92.9)	6(7.1)	4.97(1.2-20.38) *	1.90(0.34-10.51)	0.460
History of abortion	No	235	232(98.7)	3(1.3)	1	1	-
	Yes	46	40(87.0)	6(13.0)	11.6(2.7-48.27) *	7.65(1.17-49.74)	0.033**
History of involuntary/forced sex	No	212	207(97.6)	5(2.4)	1	1	-
	Yes	69	65(94.2)	4(5.8)	2.54(0.66-9.76)	9.72(1.41-66.73)	0.021**
History of tattooing	No	244	241(98.8)	3(1.2)	1	1	-
	Yes	37	31(83.8)	6(16.2)	15.54(3.7-65.3) *	11.8(2.17-65.02)	0.004**

Keys: *In a bivariate analysis, statistically significant at $p < 0.05$.

** In multivariate analysis, statistically significant at $p < 0.05$, 1 – reference category

5.6.3. Seroprevalence of Syphilis and associated factors

The overall prevalence of syphilis was 5/281(1.8%). In bivariate analysis history of husband, multiple sexual partners were associated with seroprevalence of syphilis infection ($p<0.05$). Predictor variables with $p<0.25$ in bivariate analysis were included to multivariate analysis. Multivariate analysis showed that husband history of multiple sexual partners was significantly associated with syphilis infection. Women whose husbands/partners have multiple sexual partners were 20.97 times (AOR 20.97, 95% CI,1.8-241.8) more infected by syphilis infection than their other counterparts. (Table 6).

Table 6: Bivariate and multivariate logistic regression analysis of pregnant women's Syphilis serostatus attending ANC at selected public hospitals of Addis Ababa, February 8 to March 8, 2021. (n=281)

Variables		Frequency	Syphilis serostatus		Bivariable	Multivariable	
			No n (%)	Yes n (%)	OR (95% CI)	AOR (95% CI)	P-value
Husband history of STIs	No	187	186(99.5)	1(0.5)	1	1	-
	Yes	94	90(95.7)	4(4.3)	8.26(0.91-75.03)	4.3(0.40-45.62)	0.22
Women history of sexual partners	No	180	179(99.4)	1(0.6)	1	1	-
	Yes	101	97(96.0)	4(4.0)	7.38(0.81-66.96)	7.7(0.65-91.13)	0.10
Husband history of sexual partners	No	220	219(99.5)	1(0.5)	1	1	-
	Yes	61	57(93.4)	4(6.6)	15.3(1.68-140.1)*	20.9(1.8-241.8)	0.01**
History of involuntary/forced sex	No	212	210(99.1)	2(0.9)	1	1	-
	Yes	69	66(95.7)	3(4.3)	4.77(0.79-29.17)	8.1(0.92-72.04)	0.051

Keys: *In a bivariate analysis, statistically significant at $p<0.05$.

** In multivariate analysis, statistically significant at $p<0.05$, 1 – reference category

5.6.4. Seroprevalence and associated factors of any STIs (HIV, HBV, and Syphilis)

The overall prevalence of any of the STIs (HIV, HBV, and Syphilis) was 9.3%. In bivariate analysis educational level of respondents, history of dental procedure, history of blood transfusion, history of abortion, history of tattooing, husband history of STIs, and husband history of multiple sexual partners were associated with overall the prevalence of STIs.

In multivariate analysis educational level of respondents and history of tattooing were significantly associated with the overall occurrence of sexually transmitted infections. In this study women having an educational level of secondary school were 0.11 times (AOR 0.11, 95% CI 0.03-0.41) less likely to be infected with sexually transmitted infections than those who did not have formal education. Similarly, pregnant women who have an educational level of above the secondary were 0.19 times (AOR 0.19, 95% CI; 0.04-0.77) less likely to be infected by sexually transmitted infections. In this study women having a history of tattooing were 6.24 times (AOR 6.24; 95% CI: 1.79-21.7) more likely to be infected by STIs than their other counterparts. (Table 7)

Table 7: Bivariate and multivariate logistic regression analysis of pregnant women's STIs serostatus attending ANC at selected public hospitals of Addis Ababa, February 8 to March 8, 2021. (n=281)

Variables		Frequency	Overall STIs (HIV, HBV, Syphilis)		Bivariate analysis	Multivariate analysis	
			No n (%)	Yes n (%)	OR (95% CI)	AOR (95% CI)	p- value
Previous history of pregnancy	primi	70	66(94.3)	4(5.7)	1	1	-
	multi	211	189(89.6)	22(10.4)	1.92(0.638-5.77)	0.96(0.19-4.63)	0.961
Parity	No	121	106(87.6)	15(12.4)	1	1	-
	Yes	160	149(93.1)	11(6.9)	0.52(0.230-1.181)	0.55(0.17-1.76)	0.322
Educational level							
No formal education		34	22(64.7)	12(35.3)	1	1	-
Primary school		55	55(100)	0(0.0)			
Secondary school		116	109(94)	7(6)	0.11(0.042-0.33) *	0.11(0.03-0.41)	0.004**
Above the secondary		76	69(90.8)	7(9.2)	0.18(0.065-5.77) *	0.19(0.04-0.77)	0.020**
History of hospital admission	No	197	183(92.9)	14(7.1)	1	1	-
	Yes	84	72(85.7)	12(14.3)	2.179(0.96-4.936)	1.59(0.50-5.11)	0.429
History of dental procedure	No	220	206(93.6)	14(6.4)	1	1	-
	Yes	61	49(80.3)	12(19.7)	0.278(0.121-0.63) *	2.31(0.70-7.54)	0.165
History of blood transfusion	No	227	210(92.5)	17(7.5)	1	1	-
	Yes	54	45(83.3)	9(16.7)	2.471(1.035-5.89) *	2.76(0.80-9.55)	0.107
History of Woman STIs	No	173	161(93.1)	12(6.9)	1	1	-
	Yes	108	94(87)	14(7)	1.998(0.88-4.501)	1.67(0.54-5.11)	0.367
History of Husband STIs	No	187	174(93)	13(7)	1	1	-
	Yes	94	81(86.2)	13(13.8)	2.148(0.95-4.842)	2.86(0.97-8.40)	0.055
History of abortion	No	235	218(92.8)	17(7.2)	1	1	-
	Yes	46	37(80.4)	9(19.6)	3.11(1.294-7.51) *	0.75(0.16-3.39)	0.711
History of tattooing	No	244	228(93.4)	16(6.6)	1	1	-
	Yes	37	27(73)	10(27)	5.27(2.17-12.78) *	6.24(1.79-21.7)	0.004**
History of premarital sex	No	98	86(87.8)	12(12.2)	1	1	-
	Yes	183	169(92.3)	14(7.7)	0.594(0.263-1.33)	0.34(0.10-1.16)	0.086
Hx of woman sexual partner	No	180	169(93.9)	11(6.1)	1	1	-
	Yes	101	86(85.1)	15(14.9)	2.68(1.18-6.08) *	5.15(1.68-15.7)	0.004**
History of involuntary sex	No	212	195(92)	17(8)	1	1	-
	Yes	69	60(87)	9(13)	1.721(0.72-4.059)	2.69(0.80-8.98)	0.108
Hx of husband sexual partner	No	220	204(92.7)	16(7.3)	1	1	-
	Yes	61	51(83.3)	10(16.4)	2.50(1.071-5.83) *	1.92(0.59-6.26)	0.277

Keys: *In a bivariate analysis, statistically significant at $p < 0.05$.

** In multivariate analysis, statistically significant at $p < 0.05$, 1 – reference category

6. DISCUSSION

HIV, HBV, and Syphilis infections remain a major cause of morbidity and mortality in the world despite the availability of effective screening and treatment. Interventions including early antenatal care, massive screening, and prompt treatment with antibiotics have been reported to decrease the risk of these infections. Ethiopia is one of the countries with a high prevalence of HIV, HBV, and syphilis. In the past decades, antenatal care coverage Although the information regarding HIV, HBV, and syphilis prevalence is available, data on the co-morbidity of these infections among pregnant women in Addis Ababa is rare. This study pursued to address this gap by updating the prevalence of these infections in Ethiopia and screening of pregnant women for HIV, HBV, and syphilis have been increased. among pregnant women attending antenatal care at public hospitals of Addis Ababa.

In the present study the seroprevalence of HIV among pregnant women was 5.3%, which is in line with studies done in Cameroon (5.0%) (21), sub-Saharan African countries (5.3%) (22), and Ethiopia (5.74%) (23). This finding was lower than the previous study done in China (6.6%)(20), other studies in Cameroon (13.1%) (47), Gondar (11.2%) (18), and Dessie (6,5%) (24). However, it is higher than study done in Addis Ababa (4.8%) (23), other study in Gondar (4.1%) (46), Sudan (1.13%) (29), Guatemala (0.21%) (54), Angola (2.6%) (30). The variations might be the reflections of differences in sample size (281 in this study vs 3983 in China, 385 in Gondar), sociocultural practices, accessibility to the health care system, risky sexual and behavioral practices, and awareness of HIV infection. This data indicates that the HIV epidemic is still an important public health concern among pregnant women in Addis Ababa and suggests that there is a need to strengthen intervention efforts including health education towards voluntary counseling and testing, modes of transmission, prevention, and mother to child transmission of HIV infection.

The present study demonstrated that study participants with a history of STIs exposure were 3.79 times more infected with HIV than those without previous history of STIs. This finding was supported by a research done in Dessie, (24) and Addis Ababa (23) in which the history of STIs was associated with HIV infection. This might be due to STIs create ulcer on skin and mucous membrane which in turn facilitates the acquisition of HIV infection. Pregnant women having a husband history sexual partner were 3.42 times chance to acquire HIV infection compared to their counterparts. Studies conducted in Dessie (24), Addis Ababa (23), Uganda (9), Cameroon (47),

and South west Nigeria (48) showed that the habit of multiple sexual practices were significantly associated with the acquisition of HIV infection. This may be because husbands of pregnant women have risky sexual behavior that facilitates the acquisition of HIV both for them and the women.

In this study, the overall prevalence of hepatitis B infection was 3.2%. This prevalence of hepatitis B virus infection found in the current study can be graded as intermediate endemicity according to WHO criteria. According to WHO criteria the prevalence of HBV infection can be divided into three main categories namely: high endemicity when the prevalence is >8%, intermediate endemicity when the prevalence is between 2-8%, low endemicity when the prevalence is less than 2%(15). This result is consistent with a study conducted in Kenya (3.8%) (44), Tanzania (3.9%) (43), Dawro (3.5%) (33), and Bahir Dar (3.8%) (34). Conversely, this finding was lower than studies done in Kano Nigeria (7.9%) (48), Ghana (9.5%) (27), Angola (7.5%) (30), Solomon Islands (13.8%) (26), Deder (6.9%) (35), Arbaminch (4.3%) (36), Dessie (4.7%), Yirgalem (7.2%) (55), and Southern Ethiopia (7.8%) (37). However, it is higher than studies reported in Egypt (1.6%) (52), and Sudan (2.93%) (29). The differences observed in the prevalence of hepatitis B virus prevalence across a different country might be due to differences in sociodemographic characteristics of the study population such as risky sexual and behavioral practices, sociocultural environment, and traditional operations.

According to the findings, women who had previously had an abortion were 7.65 times more likely to be infected with HBV than women who had never had an abortion. Similarly, research conducted in Nigeria (48) and Deder (35) showed that women history of abortion was substantially linked with HBV infection. Participants in the study who had a history of involuntary/forced sex were found to be 9.72 times more infected than their peers. Study participants with a history of involuntary/forced sex found to be 9.72 times more infected than their other counterparts. The present study showed that pregnant women with a history of tattooing were 11.88 times more infected than those who didn't have this phenomenon. This could be because tattooing was done in a conventional fashion, with the risk of using common sharp tools, which would facilitate the spread of hepatitis B virus infection.

The total frequency of syphilis among pregnant women was 1.8 percent in this study. This finding was consistent with research is done in Bahir Dar (2.9%) (39). Yet, the prevalence of syphilis is

higher than 0.6% of Dessie, Northwest, Ethiopia (24). Compared to other countries, the observed 1.8% seroprevalence of syphilis is lower than the 5.7% of prevalence in Cameroon (21), 2.9% in Sub-Saharan African countries (8), 3.2% in the east African region (8), and 3.8% in South African regions (8). The lower prevalence of syphilis among pregnant women might be attributed to variations in sexual and behavioral practices, difference in access to treatment of STIs, the difference in cultural practice and the increase in syphilis screening at every antenatal care visit.

The present study, showed that pregnant women whose husbands have a history of multiple sexual partners were significant risk factors for the acquisition of syphilis infection. Women whose husbands/partners have a history of having a new sex partner in the last 6 months were 20.97 times more infected with syphilis infection. Similar, studies in Ekiti State, South-Western Nigeria (50), and Bahir Dar (39) showed that a history of multiple sexual partners of women had an association with syphilis infection.

In this study, pregnant women having an educational level of secondary and above the secondary were less likely to be infected with sexually transmitted infections than those who did not have formal education. This may be due to respondents might have an awareness regarding sexually transmitted infections, transmissions, mother to child transmission, prevention, and complications of STIs in different youth and schools' clubs.

7. LIMITATION AND STRENGTH OF THE STUDY

7.1. Strength of the study

- ✚ The study has high response rate (98.2%).

7.2. Limitations of the study

- ✚ Since this study is a hospital-based cross-sectional study, the reported prevalence of HIV, HBV, and syphilis might not reflect the actual burden of the diseases at the community level.
- ✚ The study might be susceptible to responder recall and interviewer bias regarding risk factors.

8. CONCLUSION AND RECOMMENDATION

8.1. Conclusion

In this study the history of multiple sexual partners, history of tattooing, history of abortion, history of sexually transmitted infections, history of involuntary/forced sex were significantly associated with HIV, hepatitis B virus, and syphilis infection. There is still a high burden of HIV, HBV, and syphilis in our country Ethiopia especially when there is co-morbidity among these STIs. Therefore, it is important to screen STIs among all pregnant women at every antenatal care visit and give specialized care for those who have com-morbidities.

8.2. Recommendation

Based on the findings of this study, I recommend for Federal Ministry of Health, Addis Ababa health bureau, and non-governmental organizations working on communicable diseases, and maternal and child health:

- ✚ It is important to strengthen the existing antenatal care services and giving health education regarding the transmission, prevention and treatment of these infections.
- ✚ It is important to screen all pregnant women during each antenatal care visit because pregnant women might be infected with these infections at any time, they are exposed.
- ✚ It is important to give awareness for pregnant women regarding the risky sexual and behavioral practice that facilitates transmission of STIs.
- ✚ Further studies are recommended by doing serological rapid tests of human immunodeficiency virus, hepatitis B virus surface antigen, and treponema pallidum of pregnant women.

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10. ANNEXES

Annex 1: English Version Information sheet and Consent form

Title of the Research Project: Seroprevalence and associated factors of human immunodeficiency virus, hepatitis b virus, and syphilis among pregnant mothers who attend antenatal clinics at governmental hospitals in Addis Ababa, Ethiopia, 2021.

Name of Principal Investigator: Kassa Genetu

Name of the Organization: Addis Ababa University College of health sciences school of nursing and midwifery

Name of the Sponsor: Addis Ababa University College of health science

Introduction

This information sheet and consent form is produced with the objective of investigating Seroprevalence and related variables of human immunodeficiency virus, hepatitis b virus, and syphilis among expectant mothers who attend prenatal clinics at governmental hospitals in Addis Ababa, Ethiopia, 2021.

Purpose of the Research Project: This study aims to assess Seroprevalence and associated factors of human immunodeficiency virus, hepatitis b virus, and syphilis among pregnant mothers who attend antenatal clinics at governmental hospitals in Addis Ababa, Ethiopia, 2021.

Procedure: Pregnant mothers who met the inclusion criteria were included in the study. If you are willing to participate in our study, you have been chosen as one of the study participants, and we cordially encourage you to participate in our project.

We are happy if you are willing to join, and all we ask is that you understand and agree to the study's goals. Finally, you are respectfully asked to respond honestly during the interview.

Benefits, Risk, and /or Discomfort

You may feel uneasy about spending your time by participating in this study endeavor (a maximum of 30 minutes). Your participation, however, is critical in determining seroprevalence and related variables of HIV, HBV, and syphilis. Participating in this study experiment has no risk or immediate profit.

Incentives/Payments for Participating

You will not be compensated or given any incentives for participating in this study.

Confidentiality

By assigning a code number to the information collected from you, it will be kept confidential and stored in a file without your name. As a result, you will never be identified in any study report.

Right to Refusal or Withdraw

You have complete discretion over whether or not to participate in this study. You also have complete freedom to withdraw from this study at any moment.

Person to contact

The Institutional Assess Board (IRB) of Addis Ababa University College of Health Sciences will review and approve this research endeavor. You can contact us at any moment if you have any questions, and you can ask them whenever you wish.

Name: Kassa Genentu

Phone No: (+251)922 25 98 60

E-mail: kassagenen2@gmail.com

Annexes 2: English version questionnaires

Addis Ababa university

College of health sciences School of nursing and midwifery

Maternity and reproductive health nursing

A questionnaire was created to examine the seroprevalence of human immunodeficiency virus, hepatitis B virus, and syphilis, as well as associated variables, among pregnant mothers who attend prenatal clinics at state institutions in Addis Ababa, Ethiopia, 2021.

Dear

Hello, my name is _____ I am studying master's degree in Addis Ababa University College of Health Sciences offers maternity and reproductive health nursing. I'm curious about the seroprevalence of human immunodeficiency virus, hepatitis B virus, and syphilis, as well as the factors that influence it, among pregnant women who visit prenatal clinics at government hospitals in Addis Ababa. This questionnaire is designed for academic purposes which will be approved by Addis Ababa University, College of health sciences, School of nursing, and midwifery, in partial fulfillment of a master's degree in maternity and reproductive health nursing. I hope you will help me by answering these questions. None of your answers will be available to anyone. All the information you give me will be kept private. Anyone who will not be willing to participate in the study will have the right to discontinue at any time in the process. Confidentiality and privacy are maintained by ensuring the respondents answering the questions in a separate place where no one can see them. Therefore, I need your honest and genuine response. The results of the study will hopefully serve as an important input for policy and intervention programs.

I thank you in advance for taking the time to answer my questions.

Would you be willing to participate in the study?

1. Yes 2. No

If yes, proceed to the next page.

If no, please stop here.

Name of Researcher: Kassa Genetu

Address: Addis Ababa University College of health science

Phone No: +251922259860

E-mail: kassagene2@gmail.com

Name of data collector _____ signature _____

Date of questionnaire interview _____ month _____ /2013 E. C.

Supervisor's name _____ Date _____ signature _____

Time of questionnaire administer began _____ hours: minutes

Time of administered questionnaire finished _____ hours: minutes

Checked on _____ date _____ month/2013 E.C.

1. Complete 2. Partially completed 3. Incomplete

Consent form

I, the undersigned, have been informed that this study is going to be conducted to assess the Seroprevalence and associated factors of human immunodeficiency virus, hepatitis b virus, and syphilis among pregnant mothers who attend antenatal clinics at governmental hospitals in Addis Ababa. I am informed that the information I give will be kept confidential, and only used for this study. I am also conscious that I have the right not to respond to any question without my interest. Hence, I agree to participate in the research voluntarily with the hope of contributing to the effort of assessing the seroprevalence of HIV, HBV, and syphilis among pregnant women.

Signature _____

Date _____

Instruction for data collectors

Interview pregnant women, who come for ANC, encircle the response of the respondent for multiple-choice questions, and short answers write on the space provided. Review the medical records of the participant, and fill their serostatus of HIV, HBV, and syphilis in the space provided.

Table 8: English version questionnaires to determine the seroprevalence and associated factors of HIV, HBV, and syphilis among pregnant mothers in selected public hospitals of Addis Ababa, Ethiopia, 2021.

Code № _____ MRN _____			
Part I. Socio-demographic characteristics of the respondent			
№	Question	Response category code	Skip to
101	What is your age in years?	_____years	
102	What is your Marital status?	1. Single 2. Married	
103	What is your Educational level?	1. No formal education 2. Primary school 3. Secondary school 4. Above the secondary	
104	What is your occupation?	1. Employed 2. Unemployed 3. Farmer	
105	What is your monthly income?	Cash (in Birr)/month _____	
106	Have you ever had any pregnancy before?	0. No 1. Yes	201
107	If yes on a question 106, how many pregnancies have you had?	_____in number	

108	How many live births have you had? Enter №	_____ in number	
Part II. Questionnaire related to hospital-related factors			
201	Have you ever been admitted to hospitals or clinics?	0. No 1. Yes	
202	Have you ever had a dental procedure in a hospital or clinic	0. No 1. Yes	
203	Have you ever been operated on for a surgical problem in a hospital?	0. No 1. Yes	
204	Have you ever been transfused with blood	0. No 1. Yes	
205	Have you had sexually transmitted infections	0. No 1. Yes	
206	Have your partner had sexually transmitted diseases	0. No 1. Yes	
Part III. Questionnaire related to risky socio-cultural and behavioral factors			
301	Have you ever experienced an abortion?	0. No —————→ 1. Yes	303
302	If yes in question 301 How many times?	_____ in number	
303	Have you ever had a tattoo on your body	1. Yes 0. 0. No 1. Yes 2. 1. No	
304	Have you ever had an ear piercing	0. No 1. Yes	
305	Have you ever had a nose piercing	0. No 1. Yes	
306	Have you had involved in sexual intercourse before your current husband?	0. No 1. Yes	

307	Have ever use sharp instruments together with your family and or other people	0. No 1. Yes	
308	Have you had forced sex?	0. No 1. Yes	
309	Does your husband have another sexual partner?	0. No → 1. Yes	311
310	If yes on question 309 how many?	_____in number	
311	Did you have another sexual partner	0. No → 1. Yes	313
312	If yes on question No 311, how many?	_____in number	

Part IV. Checklist for assessing HIV, HBV, and syphilis serostatus of pregnant women			
313	Does the mother is seropositive for HIV?	1. Yes 2. No	
314	Does the mother is seropositive for HBV?	1. Yes 2. No	
315	Does the mother is seropositive for syphilis?	1. Yes 2. No	

Thank you!

Annexes 3: Amharic version information sheet and consent form

በጥናቱ ለሚሳተፉ የስምምነት ወል እና አጠቃላይ መረጃ

የጥናቱ ርዕስ ጉዳይ: በአዲስ አበባ ከተማ አስተዳደር በሚገኙ የመንግስት ሆስፒታሎች ውስጥ የእርግዝና ክትትል የሚያደርጉ ነፍስ ጡር እናቶች ስለ ኤች አይ ቪ ቫይረስ ፤ የጉበት ቫይረስ እና ቂጥኝ በሽታ ሁኔታቸውንና አጋላጭ የሚያደርጓቸውን ምክንያቶችን ይዳስሳል፡፡

ጥናቱን የሚያካሂደው ስም: ካሳ ገነቱ

የተቋሙ ስም: አዲስ አበባ ዩኒቨርሲቲ ጤና ሳይንስ ኮሌጅ

የስፖንሰሩ ስም: አዲስ አበባ ዩኒቨርሲቲ ጤና ሳይንስ ኮሌጅ

መግቢያ: ይህ የመረጃ ዝርዝር እና የስምምነት ቅፅ በአዲስ አበባ ከተማ አስተዳደር በሚገኙ የመንግስት ሆስፒታሎች ውስጥ የእርግዝና ክትትል የሚያደርጉ ነፍስ ጡር እናቶች ስለ ኤች አይ ቪ ቫይረስ ፤ የጉበት ቫይረስ እና ቂጥኝ በሽታ ሁኔታቸውንና አጋላጭ የሚያደርጓቸውን ምክንያቶችን ይዳስሳል፡፡

የጥናቱ አላማ: የዚህ ጥናት ዋና አላማ በአዲስ አበባ ከተማ አስተዳደር በሚገኙ የመንግስት ሆስፒታሎች ከህዳር 2013 ዓ.ም እስከ ግንቦት 2013 ዓ.ም ድረስ ነፍስ ጡር እናቶች የኤች አይ ቪ ቫይረስ ፤ የጉበት ቫይረስ እና ቂጥኝ በሽታ ሁኔታቸውንና አጋላጭ የሚያደርጓቸውን ምክንያቶችን ይዳስሳል፡፡ የዚህ ጥናት ውጤት በአዲስ አበባ ከተማ አስተዳደር የሚገኙ የመንግስት ሆስፒታሎች ነፍስ ጡር እናቶች ለኤች አይ ቪ ቫይረስ ፤ የጉበት ቫይረስ እና ቂጥኝ በሽታ አጋላጭ የሚያደርጓቸውን ችግሮች ለመፍታት አስፈላጊውን እርምጃ እዲወስዱ ያግዛል፡፡

የጥናቱ ሂደት: በጥናቱ ውስጥ ለመሳተፍ የተካተቱትን መመዘኛዎች ያሟሉ እናቶችን ያካትታል፡፡ በዚህ ጥናት ለመሳተፍ ፍቃደኛ ከሆኑ በታላቅ አክብሮት ተጋብዘዋል፡፡ ለመሳተፍ ፍቃደኛ ከሆኑ፤ እኛ በጣም ደስተኞች ነን እናም የዚህን ጥናት አላማ በትክክል መረዳት እና ስምምነትን እዲያሳዩ እንፈልጋለን፡፡ በመጨረሻም በቃለ መጠይቁ ትክክለኛ ምላሽን እንዲሰጡ በአክብሮት እንጠይቃለን፡፡

ጥቅማጥቅም፤ ጉዳት እና/ወይም የማይመች ነገር: በዚህ ጥናት በመሳተፍም ቢበዛ 30 ደቂቃ ሊፍጂበዎት ይችላል ሆኖም ግን የናንተ ተሳትፎ በአዲስ አበባ ከተማ አስተዳደር በሚገኙ የመንግስት ሆስፒታሎች ውስጥ የእርግዝና ክትትል የሚያደርጉ ነፍስ ጡር እናቶች ስለ ኤች አይ ቪ ቫይረስ ፤ የጉበት ቫይረስ እና ቂጥኝ በሽታ ሁኔታቸውንና አጋላጭ የሚያደርጓቸውን ምክንያቶች ለመዳሰስ እጅግ በጣም አስፈላጊ ነው፡፡ በዚህ ጥናት በመሳተፈዎ ምንም አይነት ጉዳት ወይም ቀጥተኛ ጥቅም አይኖረውም፡፡

ማበረታቻ/ለማበረታቻት ክፍያዎች: በዚህ ጥናት ለመሳተፍ ማበረታቻ ወይም ክፍያ አይኖረውም፡፡

ሚስጥራዊነት: ከእርስዎ የተሰበሰበው መረጃ በኮምፒውተር ውስጥ ባለ የሚስጥር ቁጥር ስምዎ ሳይኖር በሚስጠር ይቀመጣል፡፡

የመቃወም ወይም የመተወ መብት: በዚህ ጥናት ውስጥ ያለመሳተፍ ሙሉ መብት አለዎት በተጨማሪም ጥናቱን ሳያጠናቅቁ በፈለጉት ሰዓት የመተወ መብትዎ የተጠበቀ ነው፡፡

ማግኘት የሚችሉት ሰው: ይህ ጥናት አዲስ አበባ ዩኒቨርሲቲ ጤና ሳይንስ ኮሌጅ በተቋማት ግምገማ በርድ እዲፀድቅ ይደረጋል፡፡ ማናቸውም ጥያቄ ሲኖረዎት በማንኛውም ጊዜ ማነጋገር ይችላሉ በተጨማሪም ማንኛውንም መረጃ በፈለጉት ጊዜ ማግኘት ይችላሉ፡፡

ስም: ካሳ ገነቱ **ስልክ ቁጥር:** +251922259860

ኢ-ሜል: kassagene2@gmail.com

Annexe 4: Amharic version questionnaire

የአማረኛ ቃለ-መጠይቅ

**አዲስ አበባ ዩኒቨርሲቲ ጤና ሳይንስ ኮሌጅ
ነርሲንግ እና ሚድዋይሬሪ ትምህርት ቤት
ሚድዋይፍሪ ትምህርት ክፍል**

ይህ ቃለ-መጠይቅ በአዲስ አበባ ከተማ አስተዳደር በሚገኙ የመንግስት ሆስፒታሎች ውስጥ የእርግዝና ክትትል የሚያደርጉ ነፍስ ጡር እናቶች ስለ ኤች አይ ቪ ቫይረስ ፤ የጉበት ቫይረስ እና ቂጥኝ በሽታ ሁኔታቸውንና አጋላጭ የሚያደርጓቸውን ምክንያቶች ለመዳሰስ የተዘጋጀ ነው፡፡

ዉድ የጥናቱ ተሳታፊዎች!

ጤና ይስጥልኝ፤ስሜ _____ይባላል፡፡ በአሁኑ ወቅት በአዲስ አበባ ዩኒቨርሲቲ በሚድዋይፍሪ ትምህርት ክፍል የሁለተኛ ዲግሪ ትምህርቴን እየተከታተልኩ እገኛለሁ፡፡የሁለተኛ ዴግሪዬን ለመጨረስ ይረዳኝ ዘንዴ በአዲስ አበባ ከተማ አስተዳደር በሚገኙ የመንግስት ሆስፒታሎች ውስጥ የእርግዝና ክትትል የሚያደርጉ ነፍስ ጡር እናቶች ስለ ኤች አይ ቪ ቫይረስ ፤ የጉበት ቫይረስ እና ቂጥኝ በሽታ ሁኔታቸውንና አጋላጭ የሚያደርጓቸውን ምክንያቶች፤ በሚለው ርዕስ ጉዳይ ላይ ጥናት እያደረኩ እገኛለሁ፡፡ጥናቱ አዲስ አበባ ዩኒቨርሲቲ ጤና ሳይንስ ትምህርት ቤት በነርሲንግ እና ሚድዋይፍሪ ትምህርት ክፍል የጸደቀ ነው፡፡ ስለሆነም ከላይ የተዘረዘሩት የጥናቱ ዓላማዎች ይሳኩ ዘንድ በእናንተ በኩል በእውነታ ላይ የተመሠረተና ትክክለኛ የሆነ መረጃ እንድትሰጡኝ እየጠየኩ ቢቃለ መጠይቁ ላይ የምትመልሱት መልስ ግላዊ እና ስማችሁን ያላካተተ በመሆኑ በከፍተኛ ሚስጥራዊነት የሚጠበቅ ይሆናል፡፡ ከዚህም በተጨማሪ በጥናቱ ላይ የምትሳተፉት በፍቃድኝነት ስለሆነ ካልተመቻችሁ ባስፈለጋችሁ ጊዜ ማቆም/ማቋረጥ መብታችሁ ነው፡፡ እርስዎ ጥያቄ በመመለስ ብትተባበሩኝ ለጥናቱ መሳካት የራስዎን ጉልህ ድርሻ ተወጡ ማለት ነው፡፡

መጠይቁን ለመመለስ ፍቃድኝ ነሽ/ነዎት

- | | |
|-------|-----------|
| 1. አዎ | 2. አይደለሁም |
|-------|-----------|

አመሠግናለሁ፡፡

ጥናቱን የምሰራው፡ ካሳ ገነቱ እባላለሁ

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ጥናቱን የሚሰበስበው ስም _____ ፊርማ _____

ጥናቱ መሰብሰብ የተጀመረበት ቀን _____ ወር _____ /2013 ዓ/ም

የተቆጣጣሪው ስም _____ ቀን _____ ፊርማ _____

ጥናቱ መሰብሰብ የተጀመረበት ሰዓት _____ ፡ ደቂቃ

ጥናቱ ተሰብስቦ ያለቀበት ሰዓት _____ ፡ ደቂቃ

የተጣራበት ቀን _____ ወር _____ 2013ዓ/ም

1. የተሟላ 2. በክፊል የተሟላ 3. ያልተሟላ

የጥናቱ ተሳታፊዎች ፍቃደኝነት ቅፅ

እኔ የጥናቱ ተሳታፊ የሆንኩኝ እናት ይህ ጥናት በአዲስ አበባ ከተማ አስተዳደር በሚገኙ የመንግስት ሆስፒታሎች ውስጥ የእርግዝና ክትትል የሚያደርጉ ነፍስ ጡር እናቶች ስለ ኤች አይ ቪ ቫይረስ ፤ የጉበት ቫይረስ እና ቂጥኝ በሽታ ሁኔታቸውንና አጋላጭ የሚያደርጓቸውን ምክንያቶች ለመዳሰስ የተዘጋጀ መሆኑን አውቄያለሁ፡፡ የምሰጠውም ግላዊ መረጃዬ በሚስጥራዊነት እንደሚጠበቅ እና ለዚህ ጥናት አላማ ብቻ እንደሚውል ተነግሮኛል፡፡ ጥናቱ ውስጥ ያለፍላጎት ተሳታፊ ሆኜ መቀጠል እንደለብኝ እና መቀጠል ባልፈለግሁ ጊዜ ማቆም እንደምችል ተረድቻለሁ፡፡ በአጠቃላይ ከላይ የተዘረዘሩትን መብቶቼን በማወቅና የእኔ በዚህ ጥናት ላይ መሳተፍ ጥቅም አለው ብዬ በማመን በሙሉ ፍቃደኝነት ለመሳተፍ ተስማምቻለሁ፡፡

ፊርማ _____

ቀን _____

መመሪያ፡ ለመረጃ ሰብሳቢዎች

ለእርግዝና ክትትል የመጡ ነፍሰ ጡር እናቶችን ቃለ መጠየቅ በማድረግ ምላሻቸውን ከተዘረዘሩት አማራጮች በመምረጥ ያክቡ፤ ወይም በመልስ መስጫ ቦታዉ ላይ ይፃፉ። የኤች አይ ቪ ቫይረስ ፤ የጉብት ቫይረስ እና ቂጥኝ በሽታ ሁኔታቸውን/የምርመራ ዉጤታቸውን ደግሞ ከቃለመጠይቅ በኋላ የህክምና ካርዳቸውን በማየት ይመሉ።

Table 9: Amharic version questionnaires to determine seroprevalence and associated factors of HIV, HBV, and syphilis among pregnant mothers in selected public hospitals of Addis Ababa, Ethiopia, 2021.

ሰንጠረዥ ሁለት፡ የአማርኛ ቃለ-መጠይቆች

<p>ኮድ-----</p> <p>የህክምና ካርድ ቁጥር-----</p>			
ክፍል 1. መሠረታዊና ማህበራዊ ጥያቄዎች			
ተ.ቁ	ጥያቄ	መልስ	ይለፉት
101	ዕድሜሽ ስንት ነዉ	_____ በዓመት	
102	የጋብቻ ሁኔታ	1. ያላገባች 2. ያገባች	
103	የትምህርት ደረጃ	1. መደበኛ ትምህርት ያልተማሩ 2. የመጀመርያ ደረጃ የተማሩ 3. ሁለተገኛ ደረጃ የተማሩ 4. ሁለተኛ ደረጃ እና ከዚያ በላይ	
104	የስራ ሁኔታ	1. የመንግስት ሰራተኛ 2. ስራ የለኝም 3. አርሶ አደር	
105	የወር ገቢሽ (በኢትዮጵያ ብር) ስንት ነዉ	_____ በቁጥር	
106	ከዚህ በፊት እርግዝና ነበረሽ	0. የለም-----→ 1. አዎ	201
107	ጥያቄ ቁጥር 106 መልሱ አዎ ከሆነ፤ ስንት እርግዝና ነበረሽ	_____ በቁጥር	
108	በህይወት የተወለዱ ለጆችሽ ስንት ናቸዉ	_____ በቁጥር	

ክፍል ሁለት : ከሆስፒታል ጋር የተገናኙ ምክንያቶች			
201	ባለፉት ጊዜያት ሆስፒታል ተገኝተኝ ታክመኝ ታወቁያለሽ	0. የለም 1. አዎ	
202	ባለፉት ጊዜያት ሆስፒታል ወይም ከሊኒክ የፕሮስ ንቅለ ተከላ አድርገሽ ታወቁያለሽ	0. የለም 1. አዎ	
203	በህመም ምክንያት ሆስፒታል ውስጥ ቀዶ ህክምና ተሰርቶልሽ ያወቃል	0. የለም 1. አዎ	
204	ከዚህ በፊት ሆስፒታል ውስጥ ደም ተሰጦሽ ያወቃል	0. የለም 1. አዎ	
205	ከዚህ በፊት በግብረ ስጋ ግንኙነት የሚተላለፍ በሽታ ነበረብሽ	0. የለም 1. አዎ	
206	ባለቤትሽ/ የወሲብ አጋርሽ ከዚህ በፊት በግብረ ስጋ ግንኙነት የሚተላለፍ በሽታ ነበረበት	0. የለም 1. አዎ	
ክፍል ሶስት : አጋላጭ ባህላዊ እና ልማዳዊ ችግሮች			
301	ከዚህ በፊት ወርጃ አጋጥሞሽ ያወቃል	0. የለም 1. አዎ	303
302	ጥያቄ ቁጥር 301 መልሱ አዎ ከሆነ፤ ስንት ጊዜ	_____ በቁጥር	
303	ከሰውነትሽ ላይ ንቅሳት ተነቅሰሽ ታወቁያለሽ	0. የለም 1. አዎ	
304	ጆሮሽን ተበስተሽ ታወቁለሽ	0. የለም 1. አዎ	
305	አፍንጫሽን ተበስተሽ ታወቁለሽ	0. የለም 1. አዎ	
306	ከአሁኑ ባለቤትሽ በፊት ግብረ ስጋ ግንኙነት አድርገሽ ታወቁለሽ	0. የለም 1. አዎ	
307	ስለታማ ነገሮችን በጋራ ትተቀሚያለሽ	0. የለም 1. አዎ	
308	ተገደሽ ወሲብ ፈጽመሽ ታወቁለሽ	አዎ አላወቅም	

309	ባለቤትሽ ሌላ የወሲብ አጋር አለዉ	0. የለም  1. አዎ	311
310	ጥያቄ ቁጥር 309 መልሱ አዎ ከሆነ፤ ስንት?	_____ በቁጥር	
311	እርስዎ/አንቺ ሌላ የወሲብ ጓደኛ አለዎት/አለሽ	0. የለም  1. አዎ	313
312	ጥያቄ ቁጥር 311 መልሱ አዎ ከሆነ፤ ስንት?	_____ በቁጥር	

ክፍል 4፡- የነፍስ ጡር እናቶች የኤች አይ ቪ ቫይረስ ፤ የጉበት ቫይረስ እና ቂጥኝ በሽታ ሁኔታቸውን የማረጋገጫ ዝርዝር			
313	ሴትዮዋ ኤች አይ ቪ ፖሲቲቭ ነች?	1. አዎ 2. አይደለችም	
314	ሴትዮዋ ሄፓታይት ቢ ቫይረስ ፖሲቲቭ ነች?	1. አዎ 2. አይደለችም	
315	ሴትዮዋ ሲፊሊስ/ቂጥኝ ፖሲቲቭ ነች?	1. አዎ 2. አይደለችም	

አመሰግናለሁ፡፡