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Prevalance and Associated Factors of Pre-Cancerous Cervical Lesion Among Hiv-Infected and Hiv- Uninfected Women at Health Institutions in Bahir Dar City, North West, Ethiopia/2022.

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BAHIR DAR UNIVERSITY
COLLEGE OF MEDICINE AND HEALTH SCIENCES
SCHOOL OF PUBLIC HEALTH
DEPARTMENT OF REPRODUCTIVE HEALTH AND
POPULATION STUDIES

**PREVALANCE AND ASSOCIATED FACTORS OF PRE-CANCEROUS
CERVICAL LESION AMONG HIV-INFECTED AND HIV-
UNINFECTED WOMEN AT HEALTH INSTITUTIONS IN BAHIR DAR
CITY, NORTH WEST, ETHIOPIA/2022.**

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**A THESIS SUBMITTED TO DEPARTMENT OF REPRODUCTIVE HEALTH AND
POPULATION STUDIES, SCHOOL OF PUBLIC HEALTH, COLLEGE OF
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FULL TITLE OF THE STUDY	PREVALANCE AND ASSOCIATED FACTORS OF PRE-CANCEROUS CERVICAL LESION AMONG HIV-INFECTED AND HIV-UNINFECTED WOMEN AT HEALTH INSTITUTIONS IN BAHIR DAR CITY, NORTH WEST, ETHIOPIA/2022:

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Acronyms

AGC	Atypical Glandular Cells
AOR	Adjusted Odd Ratio
AIDS	Acquired Immuno-Deficiency Syndrome
CC	Cervical Cancer
CI	Confidence Interval
COR	Crude Odd Ratio
HIV	Human Immuno-Virus
HPV	Human Papilloma Virus
SSA	Sub-Sahara Africa
STD	Sexually Transmitted Disease
WHO	World Health Organization
VIA	Visual Inspection Acetic acid

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Abstract

Back ground

A precancerous cervical lesion is a cluster of precancerous cells on the cervix surface that are unique from normal cells and eventually develop in to cervical cancer. Periodic and early diagnosis of lesions can help avoid cancer. Cervical cancer is that the second leading cause of mortality in Ethiopia. Cervical cancer and human immunodeficiency virus are major public health issues and co-morbidities majorly in SSA, like in Ethiopia. And studies on the proportion of precancerous cervical lesions and predictors in HIV infected and uninfected women are almost non-existence, especially within the current study environment.

Objective: To assess the prevalence and associated factors of pre-cancerous cervical lesions among HIV-infected and HIV-uninfected women at health institutions in Bahir Dar city, Ethiopia/2022.

Method: A health institutional based comparative cross-sectional study design was conducted from May 15 to June 27, 2022, in Bahir Dar City. Data were collected from 366 HIV infected and 366 HIV uninfected using interviewer-administered structured questionnaire. Participants were selected by using systematic random sampling technique Data were coded, entered, and cleaned by used EPI data and exported to SPSS version 26. Following binary and multivariable logistic regression analysis were used to identify factors associated with precancer cervical lesions. Finally, P-value of <0.05 was considered statically significant predictors with precancer cervical lesion.

Results: In this study, the proportion of pre-cancerous cervical lesion was higher in HIV-infected 16.5% (95% CI: 12.7, 20.5) than HIV-uninfected women 9.4% (95% CI: 6.5, 12.4). women who had illiterate (AOR =6.39:95% CI (2.92, 13.98)), HIV infected (AOR =1.93:95% CI (1.11, 3.37)), initiated sexual intercourse before 18 years were (AOR = 2.67: 95% CI (1.55, 4.59)), sexual transmitted disease (AOR =3.70:95% CI (2.14, 6.14)), multiple sexual partners (AOR =3.05:95% CI (1.76,5.29)) were statistically significant with precancer cervical lesion.

Conclusion: During this study, support the hypothesis that being HIV infected has statistically correlated effect with magnitude of precancer cervical lesion and therefor the risk of it. In order that it should Government and stakeholders should give high priority for Precancer cervical lesion, youth friendly service and condom promotion.

Key words: Precancer cervical lesion, HIV infected and uninfected, Bahir Dar, Ethiopia.

1. Introduction

1.1. Background

A precancerous cervical lesion is a cluster of precancerous cells on the cervix's surface that are unique from normal cells and eventually develop into cervical cancer (1). Cervical cancer (CC) is a leading cause of mortality and it is the fourth most common cancer among women, following breast cancer, colorectal cancer, and lung cancer in the world (2). But its problem is the second leading cause of cancer mortality among Ethiopian women aged 15 to 44 after breast cancer (3). Precancerous lesions are preventable diseases through the periodic screening and early diagnosis of lesions before they proceed to malignancy, which can help to avoid cervical cancer (4).

Cervical cancer is a type of cancer that develops when the cells of the cervix become abnormal and expand uncontrollably, resulting in a tumor (5). Cervical cancer is usually developed after a long period of pre-invasive cervical lesions (6). It is due to abnormal cell development, and it can spread to other parts of the body. At this time, there are usually no symptoms. Abnormal vaginal bleeding, pelvic discomfort, or pain during sexual intercourse are some of the later signs (7). Cervical cancer and human immunodeficiency virus (HIV) infection are both major public health issues and co-morbidities around the globe, particularly in Africa's sub-Saharan countries, such as Ethiopia (8).

There are about a hundred distinct genotypes of HPV and its types are divided into two categories: high-risk and low-risk. Greater than 99.7% of cervical cancer cases are attributed to human papillomavirus (HPV) infection, while HPV 16 and 18 are responsible for 70% of cervical cancer cases (9-11). More than half of sexually active people become infected with HPV during their lifetime (12). So, based on this exposed rate, primary prevention (HPV vaccine), secondary prevention (screening and treatment of pre-cancerous lesions), tertiary prevention (detection and treatment of invasive cervical cancer), and palliative care are all part of a comprehensive cervical cancer control strategy (13).

In Sub-Saharan Africa (SSA), such as Ethiopia have the highest burden of poor socioeconomic position, a less accessible and inadequate healthcare system, and a high HIV/AIDS burden have all been linked to an increase in the prevalence of cervical cancer (14). Women living with HIV are six times more likely to develop precancer cervical lesions, and cervical cancer compared to women without HIV, and an estimated 5% of all cervical cancer cases are attributable to HIV (15).

The targets of the global strategy are that by 2030, the plan aims to vaccinate 90% of eligible girls against HPV, screen 70% of eligible women at least twice in their lives, and successfully treat 90% (16). There are two forms of HPV vaccinations available in Ethiopia: the bivalent Cervarix and the quadrivalent Gardasil vaccine, which protects genotypes 6, 11, 16, and 18 (17). HPV vaccination and cervical cancer screening for HIV-positive women are particularly critical (18). According to WHO Recommendation HPV vaccinations give that girls between the ages of 9 and 14 be vaccinated against cervical cancer because they have not yet begun sexual activity (13). In Ethiopia, current recommended CC screening method is a visual inspection acetic acid (VIA) or Visual Inspection with Lugo's Iodine (VILI), VIA has equally effective as cytology (19-21).

In the general population of women, screening should begin at 30 years of age, with frequent screening using a validated HPV test every 5 to 10 years, and for women living with HIV, screening should begin at 25 years of age. HIV-positive women should be checked more regularly, every 3 to 5 years (22). The aim of this study is to assess the prevalence and associated factors of precancer cervical lesions among HIV infected and uninfected women at governmental and non-governmental health institutions in Bahir Dar city.

1.2. Statement of the problem

Cervical cancer is the most common non-communicable disease. Cervical cancer had the fourth-highest incidence (6.6%) and death (3.5%) rates among females in 2018. In step with global cancer data, 85% of new cases and 87% of all cervical cancer fatalities occur in less developed regions (8, 23). According to the World Health Organization's non-communicable disease report, the annual number of new cervical cancer cases is expected to reach 604,000 by 2021. From this, 71,624 in high-income countries and 532,239 in low-income countries, respectively, and the world annual number of cervical cancer deaths: 342,000 from this, 29,307 in high-income countries and 312,373 in low-income countries, respectively (24, 25). Eswatini has the highest rate of cervical cancer affected countries in the world, with nearly 65% of women having the disease before the age of 75. China and India combined constituted more than a third of the worldwide cervical burden occur, 106 000 cases in China and 97 000 cases in India, and 48 000 deaths in China and 60 000 deaths in India (26).

In Africa, where there are 267.9 million women aged 15 and older who are at risk of acquiring cervical cancer, over 80,000 people are diagnosed with the illness each year, and slightly over 60,000 women die from it (27). The incidence rate was 25.2%, the mortality rate was 23.2%, and the prevalence was 27.6% in Sub-Saharan Africa. (28). Cervical cancer is the most commonly diagnosed cancer in Africa, but the highest regional incidence and mortality rates are in less developed countries, particularly in Sub-Saharan Africa, with rates particularly high in Eastern Africa (Malawi has the highest incidence and mortality rate in the world), and in Southern and Middle Africa (29).

Cervical cancer is the second most common cancer among Ethiopian women between the ages of 15 and 44. A total of 33.7 million Ethiopian women aged 15 and above are at risk of cervical cancer. According to current statistics, 7445 women are diagnosed with cervical cancer each year, with 5338 dying from the disease (30, 31). In Ethiopia, the incidence, fatality, and prevalence of the disease were 17.3%, 16.5%, and 18.2%, respectively (29). According to WHO data released in 2020, cervical cancer accounts for 0.78% of total fatalities in Ethiopia. That equates to around one death due to cervical cancer for every 128 deaths, or 14 individuals dying of cervical cancer every day, or one death every two hours (32).

In Sub-Saharan Africa (SSA), such as in Ethiopia, where an inadequate health-care system and high human immune virus/AIDS infections combine to cause an increase in the prevalence of cervical cancer (33). Women affected by HIV/AIDS are 6 times more likely to develop

precancerous lesions, making Ethiopia's 534,000 HIV-positive women among the most vulnerable to cervical cancer (17, 34). By 2040, the number of fatalities per year is expected to reach 460 000 due to demographic changes and a lack of action (14).

Consequences of cervical cancer After the occurrence of the problem in women's lives, It exposes different morbidity, From this, the most reported symptom was pain, Financial problems were also highly reported, Decreased sexual desire or activity, fatigue, high vaginal bleeding, depression, anxiety, physical problems and other reasons were reported in cervical cancer patients and decreased maternal life span in cases of early deaths (35). The cervical cancer burden spatially increases in HIV patients because HIV/AIDS are immunocompromised diseases and both diseases have enter-related characteristics. So, in the case of this, a woman's life is exposed to a double burden of co-morbidity and mortality (18).

Different reports and previous studies show that the major significant predisposing factors for precancer cervical lesion and cervical cancer were: early start of sexual contact before 15 and 18 years, middle age category of 35-44 and above 45 years, long time use of oral contraceptive pills and use of IUCD, marital status, widowed and divorced; history of sexual transmitted infections; parity greater than or equal to three, unable to be vaccinated, unable to be screened, poor economic status and multiple sexual partners in life time two and greater than two were the major predisposing factors (36-43).

Although in Ethiopia trials has been made for preventing and control mechanisms to reduce cervical cancer incidence, morbidity and mortality. From those, provide community mobilization for screening and vaccination, provide health education for girls about obstinance of unnecessary sexual contact, delays early marriage and first birth, provided training for medical personnel, provided vaccine by formal in health center and informal by campaign and provided treatment for precancer cervical lesion and cervical cancer patients including palliative care (17). However, evidences indicate that the incidence and prevalence of PCCL and CC are increase.

Although different studies were done on precancer cervical lesions among HIV infected and HIV uninfected women in Debre Tabor and Debre Markos hospitals (37, 40). but has different limitation, they didn't address the interesting variables (history of multiple sexual partners, time of sexual initiation or contact and other variables), used secondary data (sources) which makes for incomplete variables, the other study was out dated which means the study done

before seven years by 2015 G.C and done only on gynecological patient which means less representativeness of the general population.

Therefore; this study was used primary data sources and included additional variables like hygienic related factors, history of multiple sexual partners, early age of sexual contact, husband sexual partner history and other variables for the purpose of increasing the accuracy of information on both governmental and non-governmental health institutions in Bahir Dar city, by using interviewer-administered questioner and document review, to assess the prevalence of precancer cervical lesions and associated factors in HIV-infected and HIV-uninfected women, as well as it will contribute to the health service programs by generating accurate and relevant information in the study area.

1.3. Significance of the study

The findings of this study will be help to provide useful information for policymakers and health service programmers to develop strategies for the prevention and treatment of precancer cervical lesion and cervical cancer.

Furthermore, the findings of this study may provide clues to governmental and non-governmental organizations working on cervical cancer prevention and it will provide information for the Bahir Dar city health department to develop strategies based on the study results and mobilize the community to raise awareness about the human papillomavirus vaccine, screening, cervical cancer prevention and HIV testing, early detection and start treatment.

The finding also, use for clinician to know the discrepancy and associated factors of pre cancer cervical lesion and based on finding to provide spatial attention for clients as individual level. For researchers who are interested in conducting research in this related case, may use it as a reference. Therefore, the aim of this study is to assess the prevalence and associated factors of precancer cervical lesions among HIV-infected and uninfected women at health institutions in Bahir Dar city.

2. Literature Review

2.1. Magnitude of pre-cancerous cervical lesion among HIV-infected and HIV-uninfected women

In the world different literatures shows that the prevalence of precancer cervical lesion and associated factor in HIV infected and HIV uninfected women. So, cross sectional studies done in China and Russia, the prevalence of precancer cervical lesion shows that 5.8%, and 12.6% respectively (38, 44). Systematic Review and Meta-Analysis study done in Latin America and the pooled prevalence of precancer cervical lesion was 16.8% (45). And analytical experimental study done in Saudi Arabia, it was 6.5% (46).

In developing countries, the studies might be conducted in Rwanda, Cameroon by using cross sectional study design shows that the overall magnitude of precancer cervical lesions in women was 5.9% and 3.33% respectively (47, 48). And in other study done in Democratic Republic of Congo, Swaziland, Tanzania and Kenya while use a comparative cross sectional study conducted the overall prevalence of precancer cervical lesion was 7.46%, 14.3%, and 30.5% and relatively compare with greater among HIV infected women was 31.3 %, 22.9%, 71.8% and 42% than in HIV uninfected women was 3.9 %, 5.7%, 27.3% and 19% respectively (42, 49, 50) (51).

Two systematic review and meta-analysis done in Ethiopia, the pooled prevalence of precancerous cervical lesion was 15.16 and 13.4% respectively (52, 53). Other cross sectional studies done in Gahandi Memorial Hospital, saint Paul's hospital, Adamma Hospital and Harar city, the prevalence of precancer lesion was 14.6%, 24.1%, 15.7% and 15.3% respectively (39, 41, 43, 54).

In Amhara, the studies were conducted in Debre Markose hospital and Debre Tabor hospital, by used institution-based comparative cross-sectional studies show that the prevalence of precancer cervical lesion were 8.8%, 14.1% and compare with HIV infected more exposed for PCCL 9.3%, 17.8% than HIV uninfected women 8.6%, 10.3% respectively (37, 40).

2.2. Factors associated with pre-cancerous cervical lesion among HIV-infected and HIV-uninfected women.

2.2.1. Socio demographic related factors

A study conducted in different world countries (China, Saudi Arabia, Cameroon, Ruanda, Kenya, Harary, East Gojjam and Debre tabor) shows that sociodemographic factors strongly associated with precancer cervical lesion in HIV infected and HIV uninfected women. From those as evidence shows middle age 35-44 years of women were associated with precancer cervical lesion in HIV positive and HIV negative women in China, Cameroon, Kenya and East Gojjam (36-38, 42, 48). But in other study age greater than 45 years was associated with precancer cervical lesion in HIV Infected and uninfected women in Debre Tabor hospital (37). And oppositely age not associated factor with precancer cervical lesion among HIV Infected and uninfected women in Russia, Kenya, Gahandi Memorial Hospital, saint Paul's hospital, Adamma Hospital and Harar city Debre Markos hospital (39-44, 54).

In different studies educational level being illiterate was significantly associated factor for precancer cervical lesion in HIV positive and HIV negative women in Saudi Arabia, Kenya, Harary and Debre tabor Hospital (37, 42, 43, 46). But in other side different studies show that educational status not associated with precancer cervical lesion in HIV infected and uninfected women in China, Cameroon, Ruanda, Adamma, Paulos hospital, Debre Markos Hospital (38, 40, 41, 47, 48, 54). And in another sociodemographic factors marital status of windowed, divorce and single were associated with precancer cervical lesion in HIV infected and HIV uninfected women in China, Ruanda, Harar, Debre Tabor and Debre Markos Hospital (37, 38, 40, 43, 47). But in opposite side marital status not associated factors in Gahandi memorial hospital and Paulos Hospital and Adamma Hospital (39, 41, 54).

All studies incorporate all sociodemographic related factors, from these age, marital status and educational level were significantly associated with precancer cervical lesion in HIV infected and uninfected women from different studies But Residence, Ethnicity, Occupation, Religion, Ethnicity were not associate with PCCL. So, all sociodemographic related factors incorporate in this study and identify associated factors with precancer lesion in HIV infected and uninfected women.

2.2.2. Reproductive Health Related factors

Different studies show that reproductive health related factors associated with precancer cervical lesion in HIV positive and negative women. So, studies conducted in China and East Gojjam, IUCD and oral contraceptive pills used were associated factors with precancer cervical lesion affected women (36, 38). And longtime oral contraceptive pills used was significantly associated factor with precancer cervical lesion affected women in Swaziland, Cameroon, Democratic republic of Congo, Gahandi memorial hospital, Harar and Debre Markos hospital (39, 40, 43, 48-50). But On the other hand, the studies conducted in Kenya, Paul's Hospital, Debre Tabor hospital show controversially, contraceptive used not associated factor (37, 41, 42).

In different studies show that parity greater than two were significantly associated factor for precancer cervical lesion in HIV infected and non-infected women in Ruanda, East Gojjam, Debre Markos hospital and Debre tabor (36, 37, 40, 47). In other conducted studies show the opposite side parity was not associated factor with precancer cervical lesion in Kenya, Swaziland, Paulo's hospital and Gahandi memorial hospital were (39, 41, 42, 50).

The studies conducted in Democratic Congo, on this study history of abortion was significantly associated factor with precancer cervical lesion affected women (49). But history of abortion not associated factor with precancer cervical lesion in other the same related title studies. In Adama the study show that history of menstruation was strongly associated factor with precancer cervical lesion. But this variable in other different studies not associated with precancer cervical lesion (54).

In Addis Abeba Paulo's hospital the study was done and show that early marriage age less than 18 years women and age at birth of first child less than 18 years was significantly associated factor with precancer cervical lesion (41). But this factor from other studies not associated factor with PCCL (36, 38-43, 48-50, 54). On the other hand, history of Sexual transmitted disease was statistically associated factor with precancer cervical lesion for HIV positive and HIV negative women in China, Saudi Arabia, Swaziland, Adamma Hospital and East Gojjam (36, 38, 46, 50, 54). But the opposite side other studies show those women who had history of sexual transmitted disease was not statistically associated factor with precancer cervical lesion for HIV positive and HIV negative women in Kenya, Debre Tabor hospital and Debre Markos hospital (37, 40, 42). One study show that in HIV status, HIV Positive women significantly associated factor with precancer cervical lesion (53). History of cervical cancer screening and

history of pregnancy were not significantly associated factor with precancer cervical lesion in previous studies but for further identification of the factors was added in this study.

2.2.3. Sexual behavior related factors

Different studies show that sexual behavior related factors significantly associated with precancer cervical lesion in HIV positive and negative women. So, Greater than or equals two (≥ 2) lifetime sexual partners was significantly associated factor for precancer cervical lesion in China, Swaziland, Cameroon, Democratic republic of Congo, Gahandi memorial hospital, Harar and East Gojjam(36, 38, 39, 43, 48-50). In sexual behavior of the women Early age of sexual contact less than 15 and 18 years were significantly associated factor with precancer cervical lesion infected women in China, Ruanda, Addis Abeba Paul's hospital, Gahandi memorial hospital and East Gojjam (36, 38-41, 47). Controversially Early age of sexual contact less than 18 years not associated factor in other studies in Swaziland, Kenya, Debre Tabor and Debre Markos (37, 40, 42, 50).

Other sexual behaviors related factor Having a husband with history of multiple sexual partner greater than and equals to two was significantly associated factor with precancer cervical lesion of HIV positive and HIV negative women in Harar (43). Time of condom use was not significantly associated factors with precancer cervical lesion in previous studies but for further identification of the factors was added in this study.

2.2.4. Life style and Hygienic related factors

Different studies conducted and shows that life style related factors associated with Precancer cervical lesion in HIV infected and uninfected women, from those, Alcohol drinking were Significantly associated factors with precancer cervical lesion in China and Saudi Arabia (38, 46). But verses of this from other studies Alcohol drinking were not Significantly associated factors with precancer cervical lesion.

Hygienic related factors Sharing of underwear cloth and Genital hygiene practice of clean your genital area were incorporate from one study in Bahir Dar city by used case control study design but these variables not associated factors with precancer cervical lesion (5). But in this study incorporate of sharing of underwear cloth and Genital hygiene practice of clean your genital area per day were incorporated and checked the associated with precancer cervical lesion among in HIV infected and uninfected women.

The above information tell me that the magnitude and proportion of precancer cervical lesions varies from place to place, HIV status and also the type of study design used has effect on the

overall prevalence and proportion of precancer cervical lesion and associated factors, while that greater than or equals two life time sexual partners, history of sexual transmitted infection, HIV status, age, occupation, marital status of widowed and divorce and other factors were show significantly associated factors for precancer cervical lesion in HIV infected and uninfected women. So, this study has contribution to generated information on the current prevalence and associated factors of precancer cervical lesion between HIV infected and Uninfected women was happened on following her life time in Bahir Dar city.

2.3. Conceptual Framework

This conceptual framework work is derived from different cross-sectional and case control studies to demonstrated that variables of precancer cervical lesion in HIV infected and uninfected women and associated factors (5, 36, 37, 41).

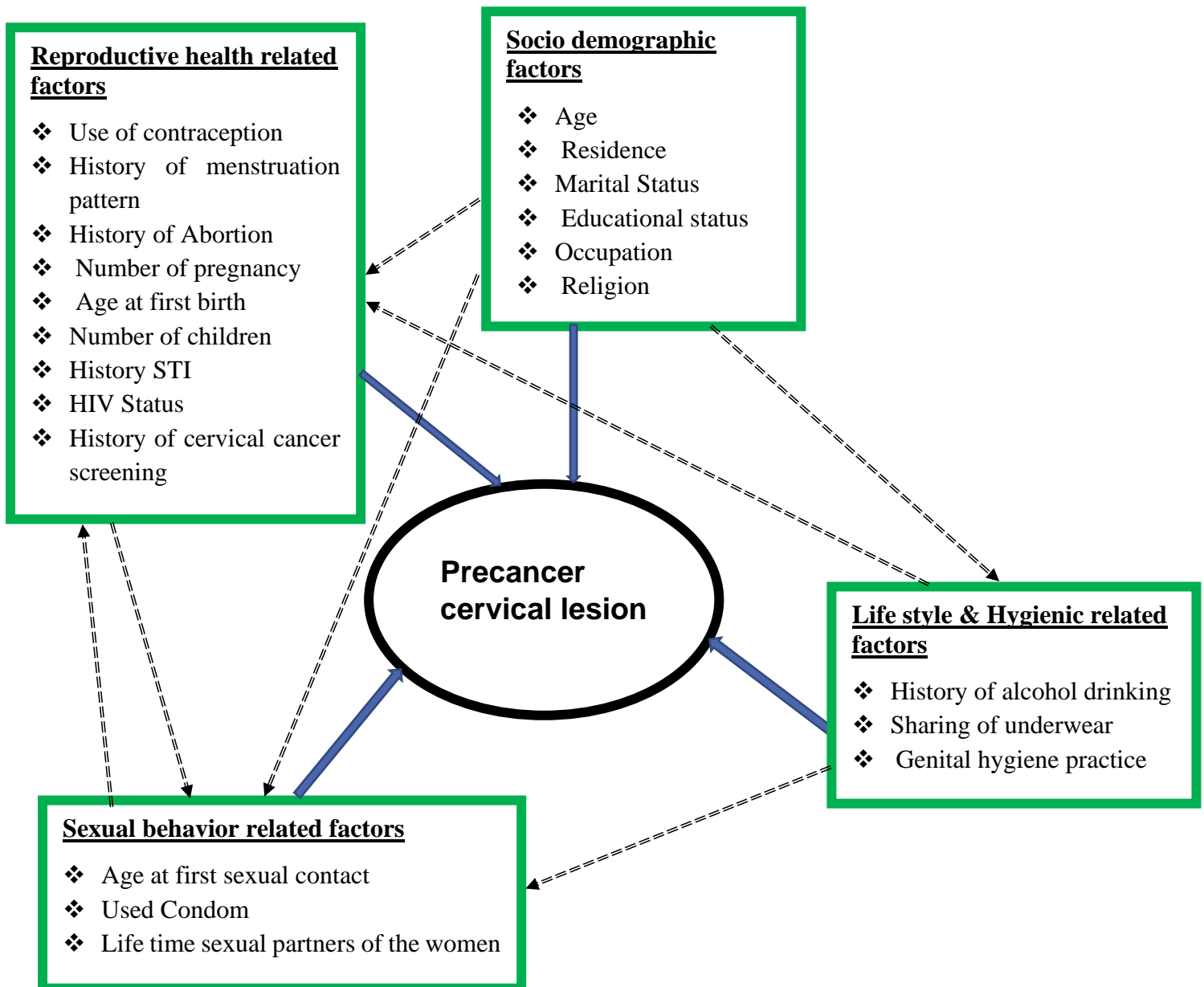


Figure 1: Based on review of literatures, this conceptual framework was developed to assess the prevalence of precancer cervical lesion and associated factors among HIV-infected and uninfected women in health institutions in Bahir Dar, North West Ethiopia, in 2022

3. Objectives

3.1. General objective

- ❖ To assess the prevalence and associated factors of pre-cancerous cervical lesion among HIV-infected and HIV-uninfected women at health institutions in Bahir Dar city, North West, Ethiopia/2022.

3.2. Specific objectives

- To compare the prevalence of pre-cancerous cervical lesion among HIV-infected and uninfected women in health institutions in Bahir Dar city, North West, Ethiopia.
- To identify factors associated with precancer cervical lesion among HIV-infected and HIV- uninfected women at health institutions in Bahir Dar city, North West, Ethiopia.

4. Methods

4.1. Study design and period

A health institutional based comparative cross-sectional study design was conducted in Bahir Dar City governmental and non-governmental health institution from May 15 to June 27, 2022.

4.2. Study area and setting

The study conducted in Bahir Dar City, North West Ethiopia, which is located in Amhara region, at distance of 565 km from Addis Ababa. Based on the report of Bahir Dar city Municipality, the total population of Bahir Dar City in 2011 was 445,084. From this population, 222,987 (50.1%) were females. There are 6 kifle-ketemas in Bahir Dar City. Total number of HIV positive men and women 14914. Only female 8134 in Bahir Dar city. According to health department; the health infrastructure of the zone is organized by three governmental hospitals, six health centers, four private general hospitals, thirty-five private medium clinic, and three non-governmental organizational clinics. From those, three governmental hospitals, six health centers and two non-governmental clinics are provided cervical cancer screening service with health professionals. So, the study was conducted from all cervical cancer screening service provided governmental hospitals, health centers and non-governmental clinics in Bahir Dar city.

4.3. Source and Study Population

4.3.1. Source population

All HIV infected and Uninfected women 'who screened for cervical cancer at governmental and non-governmental health institutions in Bahir Dar city.

4.3.2. Study population

All HIV infected and Uninfected women who screened for cervical cancer in governmental and non-governmental health institutions in Bahir Dar city during the data collection time were the study population.

4.3.3. Sample population

All HIV infected and Uninfected women who screened for cervical cancer in governmental and non-governmental health institution during data collection time and they were included for interview.

4.4. Inclusion and Exclusion Criteria

4.4.1. Inclusion Criteria

All HIV infected and uninfected women who screened for precancer cervical lesion were included in this study.

4.4.2. Exclusion Criteria

All HIV infected and uninfected women who screened for precancer cervical lesion but, those who was unable to speak were excluded in this study.

4.5. Sample size and sampling procedures

4.5.1. sample size determination

Sample size was calculated using double population proportion formula as $n = (Z_{\alpha/2} + Z_{\beta})^2 * (p_1(1-p_1) + p_2(1-p_2)) / (p_1 - p_2)^2$, for first objective and using Epi-info version 7.2 for second objective. Then the following assumptions were considered: $Z_{\alpha/2}$ is the critical value of the Normal distribution at $\alpha/2$ for a confidence level of 95%, α is 0.05 and the critical value is 1.96), Z_{β} is the critical value of the Normal distribution at β for a power of 80%, β is 0.2 and the critical value is 0.84), ration 1:1 and the proportion of precancer cervical lesion between HIV infected and uninfected women among the study participants in previous study was HIV-infected $P_1 = 17.8\%$ and HIV-uninfected women $P_2 = 10.3\%$ at Debre Markos hospital (40). Then calculated sample size by using two population proportion formula the maximum sample was $n_1 = 333$ then, add 10% of non-response rate and the final sample size were taken $n_1 = 366$ for HIV infected women and $n_2 = 366$ for HIV uninfected. Total sample size for both group **n=732**

4.5.2. Sampling procedure

This study was collected data from all cervical cancer screening service provider health institutions, which means from three governmental hospitals, six health centers and two non-governmental clinics in Bahir Dar city. And the previous year twelve months report divided to six and got two months study population number of cervical cancer screened women in all hospital, health center and NGO clinics total number of case flow in HIV positive 586 and HIV negative 761 total 1347. Study participants were selected by use systematic random sampling technique. As a sampling frame with calculated K value by using the formula N/n , So, the sampling performed with calculated ($k=1.6$ but approximately $K=2$) for HIV infected women and ($k=2$) for HIV uninfected women. The first women selected by using lottery method and this lottery method provided second comer women during the first-time data collection used for interview and document review in each health institutions and continued every two intervals up to the required sample size was saturated. All participants were gotten immediately after screened of precancer cervical lesion and HIV tested, for interview and document review. Additionally, for HIV infected women go to ART ward and asked previously screened precancer cervical lesion in this institution? her answer yes included in this study for interview and use document review for know her Precancer cervical lesion status.

All cervical cancer screening provider health institution



TGSTH	FHRH	AAH	AHC	BDHC	SHC	DMHC	HHC	SHC	MC	FGAEC
295	236	162	76	126	76	77	142	45	37	75

By proportional allocation to sized based on HIV infected and uninfected cervical cancer screened women 12/6=2 months report from this HIV infected(**n₁**) = **586** and HIV uninfected (**n₂**) =**761**

Systematic random sampling

HIV infected
N₁ = 366

HIV uninfected
N₂ = 366

Total sample size n=732

Legend

- | | |
|---|-------------------------------|
| TGSTH = Tibebe Ghion spatialized teaching hospital | BDR = Bahir Dar health center |
| FHRH = Felege hiwot referral hospital | HHC = Han health center |
| AAH = Addis Alem hospital | AHC = Abay health center |
| SHC = Shinbit health center | SHC = Shumabo health center |
| FGAEC = Family guidance association Ethiopia clinic | MC = Mari stop clinic |

Figure 2: schematic presentation of sampling technique for the assessment of proportion and associated factors of precancer cervical lesion among HIV infected and uninfected women in Bahir Dar 2022.

4.6. Study Variables

4.6.1. Dependent Variable

- Precancerous cervical lesion. (Yes / No)

4.6.2. Independent variables

Socio demographic characteristics

- Age, Residence, Marital Status, Educational status, Occupation, Religion, Ethnicity

Reproductive Health Related characteristics

- Use of contraception, History of menstruation pattern, History of Abortion, Number of pregnancies, Age at first birth, Number of children, History STI, HIV Status and History of cervical cancer screening

Sexual behavior related factors

- Age at first sexual contact, Use Condom, Life time sexual partners of the women and History of husband sexual partner

Life style & hygienic related factor

- History of alcohol drinking, Sharing of underwear, Genital hygiene practice

4.7. operational definitions

- ❖ **HIV Infected:** Is during document review HIV positive result recorded in registration book called HIV infected. (55).
- ❖ **HIV uninfected:** Is during document review HIV negative result recorded in registration book called HIV infected (55).
- ❖ **Precancer cervical lesion:** which is also during document review the positive result recorded on registration book were called precancer cervical lesion (1).
- ❖ **Multiple sexual partners:** in this study called multiple sexual partners were a woman who had history of two or more sexual partners in her lifetime (56).
- ❖ **Early Age of sexual contact:** Initiation of sexual intercourse before the age of 18 years, and women reported start sexual contact before this age category during data collection period (57).
- ❖ **History of Menstruation pattern:** In this study during data collection period, women reported her menstrual flow history might occur every 21 to 35 days called regular. But less than 21 days and greater than 35 days called irregular menstruation flow (58).
- ❖ **Sharing of underwear:** women who sharing their pants from family, friends, and other relatives in her life time (5).
- ❖ **Genital hygiene practice:** vaginal washing practice per day. If women cleaned her genital area greater than or equals two time per day was considered as good hygiene practice in this study and clean only one time per days called poor hygiene practice (5).
- ❖ **History of alcohol drinking:** Alcohol is formed when yeast ferments (breaks down without oxygen) the sugars in different food. Normal recommended alcohol drinking in Ethiopia is Moderate alcohol use for healthy adults generally means up to one drink a day for women Examples: Beer, Tela: 355 milliliters. But individually greater than 355ml drunk called high alcohol intake (59).

4.8. Data collection procedure and Data Quality control

Data were collected by using semi-structured interviewer administrated questionnaires and document review. The questionnaire was developed by used reviewing different literatures with similar studies. So, has questions of socio-demographic variables, reproductive health related variables, sexual behavior related variables and Life style and hygienic related variables. Before the data collection the questionnaire was translated to Amharic by professional translators and then back to English to check for consistency. Finally, Amharic version was used. The data were collected by six BSc nurses, and it was supervised by one BSc midwifery and the principal investigators as well. The interview was carried out secured, comfortable and private environment and the participant was interviewed after screened precancer cervical lesion and HIV tested. The interview stayed for twenty minutes and encourage participants to reply honestly.

The data collectors and supervisor were trained for two days and pre-test of questionnaire was done in Gonder teaching hospital. The questionnaires were tested on 5% precancer cervical screened women in this hospital and ensured that completeness, reliability and validity of questioners. Then after some adjustment was done in the questionnaire and extra briefing were made to the data collectors. To ensure the quality of data, daily meeting was held between the principal investigator and the data collectors to detect any problems that have arisen. In addition, inspection for completeness and quality of data collection were carried out daily by Investigator and supervisor and detailed feedback were provided to data collectors.

4.9. Data processing and analysis

The collected data was coded, entered and cleaned, into **EPI- Data version 4.6.0.2** and then exported in to **SPSS Version 26** for analysis. Descriptive statistics was computed for all variables and summarized with tables, frequencies and graphs. Binary Logistic regression model was used to identify factors association between predictors and outcome variable. First bi-variable logistic regression analysis was done to see the association of each independent variable with the outcome variable and crude odds ratio (COR) with 95% CI was computed secondly, those variables having a *P*- value < 0.25 were entered into the multi-variable logistic regression analysis. And check multi collinearity. Then a *p*-value of < 0.05 on multi -variable logistic regression models were considered statistically significant And AOR with 95% CI used to measure the strength of association between predictor variables and the outcome variable.

Multi collinearity checked by used Pearson and variable inflation factors (VIF) and model fitness was checked through Hosmer and lemeshow goodness of fit test and was fitted at **0.297**.

4.10. Ethical considerations

Ethical clearance was obtained from Bahir Dar University College of medicine and Health Sciences, Research ethics review committee protocol number IRB 444/2022. Then, letter from the research ethics committee was submitted to Zone health office, hospitals, health centers and non-governmental clinics. And a letter of permission was secured from administrative bodies of the area to communicate with relevant bodies at the institution. Before enrolling any eligible study of participants purpose, benefits, confidential and nature of the study was described and discussed for each participant. The discussion between the data collectors and the respondents were taken place privately and individually. Only those consented and provided their willingness to take part in the study was enrolled and interviewed.

4.11. Dissemination of research findings

The finding of study submitted to Bahir Dar university college of medicine and health science, Amhara regional Health bureau, Bahir Dar zonal health department, three hospitals, six health centers and two clinics. Furthermore, effort will be made to present the finding of the study for different professional/conference meetings and the manuscript will be send to different journals for possible publication.

5. Results

5.1. Socio-demographic characteristics of the respondents

A total of 697 pre-cancerous cervical lesion screened women participated by two groups HIV infected (334) and HIV-uninfected women (363). From those the response rate and the overall mean age of the respondents were 95.2% and 34.97 (± 7.284 SD) years, respectively. The majority of the study participants; 508 (72.9%), were in the age group of 30–45 years. Regarding marital status, about 288 (41.3%) were married and 155 (22.2%) of the respondents were unable to read and write whereas, while 270 (38.7%) were merchants. (Table 2)

Table 1: Socio-demographic Characteristics of precancer cervical screened among HIV infected and uninfected women' in Bahir Dar City, North West, Ethiopia, 2022 (n = 697)

<u>Variables</u>	<u>Category</u>	HIV infected women n=334	HIV uninfected women n=363	Total n=697	X ² , (P- Value)
		Number (%)	Number (%)	Number (%)	
Age	< 30 years	58 (17.4)	69 (19.0)	127 (18.2)	2.14, (0.342)
	30- 45 years	250 (75.1)	258 (70.9)	508 (72.9)	
	>45 years	25 (7.5)	37 (10.2)	62 (8.9)	
Marital status	Single	49 (14.7)	49 (13.5)	98 (14.1)	5.45, (0.139)
	Married	128 (38.3)	160 (44.1)	288 (41.3)	
	Divorced	85 (25.4)	68 (18.7)	153 (22)	
	Widowed	72 (21.6)	86 (23.7)	158 (22.7)	
Religion	Orthodox	167 (50)	201 (50.4)	368 (52.8)	2.07, (0.35)
	Muslim	73 (21.9)	73 (20.1)	146 (20.9)	
	Protestant	94 (28.1)	89 (24.5)	183 (26.3)	
Educational status	Unable to read and write	74 (22.2)	87 (24)	161 (23.1)	3.2, (0.036)
	Grade 1-8	58 (17.4)	69 (19)	127 (18.2)	
	Grade 9-12	107 (32)	94 (25.9)	201 (28.8)	
	Diploma& above	95 (28.4)	113 (31.1)	208 (29.8)	
Occupation	Governmental employee	92 (27.5)	104 (28.7)	196 (28.1)	8.31, (0.014)
	Merchant	140 (41.9)	130 (35.8)	270 (38.7)	
	House wife	80 (24)	93 (25.6)	173 (24.8)	
	Farmer	11 (3.3)	25 (6.9)	36 (5.1)	
	Commercial worker	11 (3.3)	11(3)	22 (3.2)	
Residence	Urban	328 (98.2)	329 (90.6)	657 (94.3)	18.42, (<0.001)
	Rural	6 (1.8)	34 (9.4)	40 (5.7)	

5.2. Reproductive health- characteristics of women who screened precancer cervical lesion status in the health facilities

In this study, the proportion and average of precancer cervical lesion positive between HIV infected and uninfected women **55 (16.4%), 34 (9.4%) and 89 (12.8%)**, respectively. The majority of women 493 (70.7%) had previously not screened cervical cancer. Regarding 559 (80.2%) women had at least one time used contraceptive in women life time. However, 262 (37.6%) of the respondents had still greater than two times history of pregnancy. Similarly, 108 (32.3%) of HIV infected and 115 (31.7%) of the HIV uninfected women had been affect by at least one type of sexual transmitted disease. (Table 3)

Table 2: Reproductive health related characteristics of precancer cervical lesion screened among HIV infected and uninfected women in Bahir Dar City, North West, Ethiopia, 2022 (n = 697).”

<u>Variables</u>	<u>Category</u>	HIV infected women n=334 Number (%)	HIV uninfected women n=363 Number (%)	<u>Total</u> n=697 Number (%)	X ² , (P- Value)
Precancer cervical lesion status	Positive	55 (16.5)	34 (9.4)	89 (12.8)	7.87, (0.005)
	Negative	279 (83.5)	329 (90.6)	608 (87.2)	
Previously screened cervical cancer	Yes	92 (27.5)	112 (30.9)	204 (29.3)	0.92, (0.337)
	No	242 (72.5)	251 (69.1)	493 (70.7)	
Contraceptive User	Yes	273 (81.7)	286 (78.8)	559 (80.2)	0.95, (0.329)
	No	61 (18.3)	77(21.2)	138 (19.8)	
Type of contraceptive	Pills	90 (26.9)	69 (19)	159 (22.8)	25.6, (< 0.001)
	Injectable	103 (30.8)	100 (27.5)	203 (29.1)	
	Implant	79 (23.7)	92 (25.3)	171 (24.5)	
	IUCD	1 (0.3)	25 (6.9)	26 (3.7)	
Duration of contraceptive used	<2 Years	48 (14.4)	60 (16.5)	108 (15.5)	26.7, (<0.001)
	2-5 Years	163 (48.8)	111 (30.6)	274 (39.3)	
	>5 Years	62 (18.6)	115 (31.7)	177 (25.5)	
Number of pregnancy	≤2	209 (62.6)	226 (62.3)	435 (62.4)	0.007, (0.931)
	>2	125 (37.4)	137 (37.7)	262 (37.6)	
Number of parity	≤2	242 (72.5)	259 (71.3)	501 (71.9)	0.11, (0.746)
	>2	92 (27.5)	104 (28.7)	196 (28.1)	
Age at first birth	< 18 years	52 (15.6)	30 (8.3)	82 (11.8)	8.08, (0.004)
	≥18 years	282 (84.4)	322 (88.7)	604 (86.7)	
History of menstruation pattern	Regular	224 (67.1)	268 (73.6)	492 (70.6)	3.83, (0.050)
	Irregular	110 (32.9)	95 (26.4)	205 (29.4)	
History of abortion	Yes	151 (45.2)	145 (39.9)	296 (42.5)	1.93, (0.16)
	No	183 (54.8)	218 (60.1)	401 (57.5)	

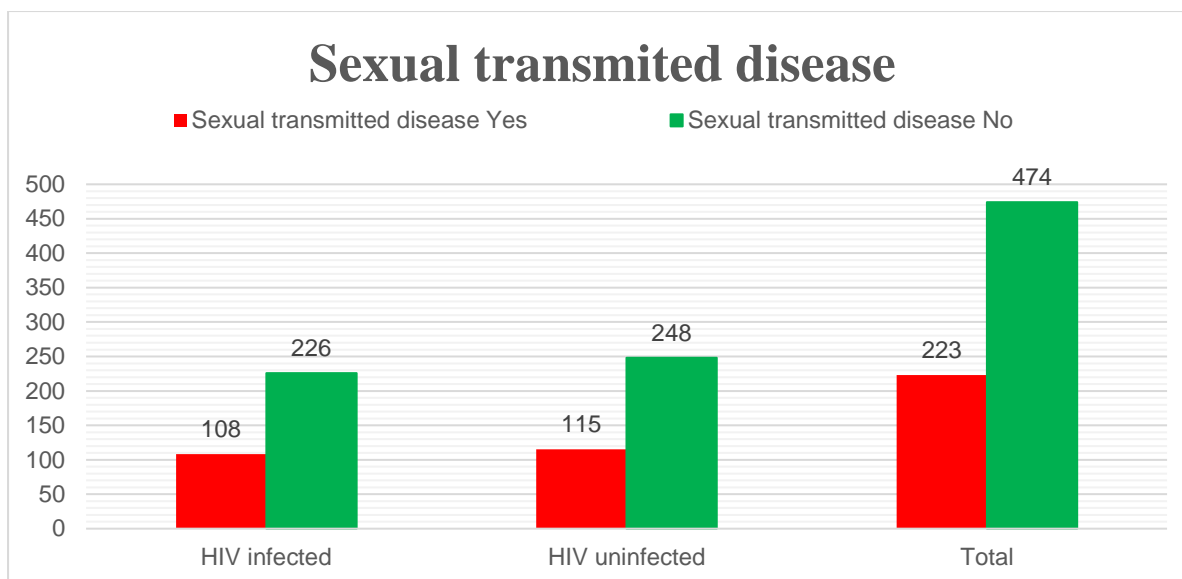


Figure 3: History sexual transmitted disease who had precancer cervical lesion screened among HIV infected and uninfected women in Bahir Dar city/2022.

5.3. Sexual behavior, Life style and Hygienic related characteristics of the respondents

According to the current study, Majority of 372 (53.4%) women not used condom during multi sexual partner relation/contact. About 144 (43.1%) of the HIV infected and 108(29.8%) of the HIV uninfected women first age of sexual contact < 18 years. Similarly, 140 (41.9%) HIV infected of women and 129 (35.5%) of the HIV uninfected women had been number of sexual partners in her life time greater than or equal to two. Three fourths of the women (71.3%) had not known about her husband history of sexual partner. Whereas, while 618 (88%) of women clean her genital area two and above times per day and 284 (40.7%) women had history of sharing under wear cloth (pant) with family/friend in her life time. (Table 4)

Table 3: Sexual, Life style and Hygienic related Characteristics of pre-cancer cervical screened among HIV infected and uninfected women' in Bahir Dar City, North West, Ethiopia, 2022 (n = 697)

<u>Variables</u>	<u>Category</u>	HIV infected women n=334 Number (%)	HIV uninfected women n=363 Number (%)	Total n=697 Number (%)	X ² , (P- Value)
Age of first sexual relation/contact	< 18 years	144 (43.1)	108 (29.8)	462 (66.3)	13.3, (<0.001)
	≥ 18 years	190 (56.9)	255 (70.2)	235 (33.7)	
Number of sexual partners in her life time	< 2 sexual partner	194 (58.1)	234 (64.5)	427 (61.3)	2.9, (0.084)
	≥2 sexual partners	140 (41.9)	129 (35.5)	270 (38.7)	
Used condom	Every sexual contact	24 (7.2)	16 (4.4)	40 (5.7)	11, (0.004)
	Sometimes	153 (45.8)	132 (36.4)	285 (40.9)	
	Never	157 (47)	215 (59.2)	372 (53.4)	
history of husband sexual partner	Yes	99 (29.6)	105 (27.8)	204 (28.4)	0.42, (0.518)
	No	235 (70.4)	262 (72.2)	499 (71.6)	
number of husband sexual partner	< 2 sexual partner	45 (14.1)	45 (12.4)	90 (12.9)	0.02, (0.877)
	≥ 2 sexual partners	54 (16.8)	60 (17.4)	114 (16.4)	
history of alcohol drinking	Yes	240 (71.9)	222 (61.2)	462 (66.3)	8.91, (0.003)
	No	94 (28.1)	141 (38.8)	235 (33.7)	
share under wear (Pant) with families & friends	Yes	138 (41.3)	146 (40.2)	284(40.7)	0.087, (0.768)
	No	196 (58.7)	217 (59.8)	413 (59.3)	
Number of genital area clean per day	One time	48 (41.3)	31 (8.5)	79 (11.3)	55.8,(< 0.001)
	Two times	156 (58.7)	269 (74.1)	425 (61)	
	More than two times	130 (38.9)	63 (17.4)	193 (27.7)	
Type of solution use for cleaning	Water only	264 (79)	288 (79.3)	552 (79.2)	0.01, (0.923)
	Water with soap	70 (21)	75 (20.7)	145 (20.8)	

5.4. Prevalence of Pre-Cancerous Cervical Lesion between HIV infected and HIV uninfected Women

The overall prevalence of pre-cancerous cervical lesion among 732 women was 12.8% (95% CI; 10.5, 15.2). The proportions of pre-cancerous cervical lesion were observed to be higher; 16.5% (95% CI; 12.7, 20.5) among HIV- infected women relative to HIV-uninfected 9.4% (95% CI; 6.5, 12.4) and the difference between HIV infected and uninfected was statistically significant ($P = 0.0021$)

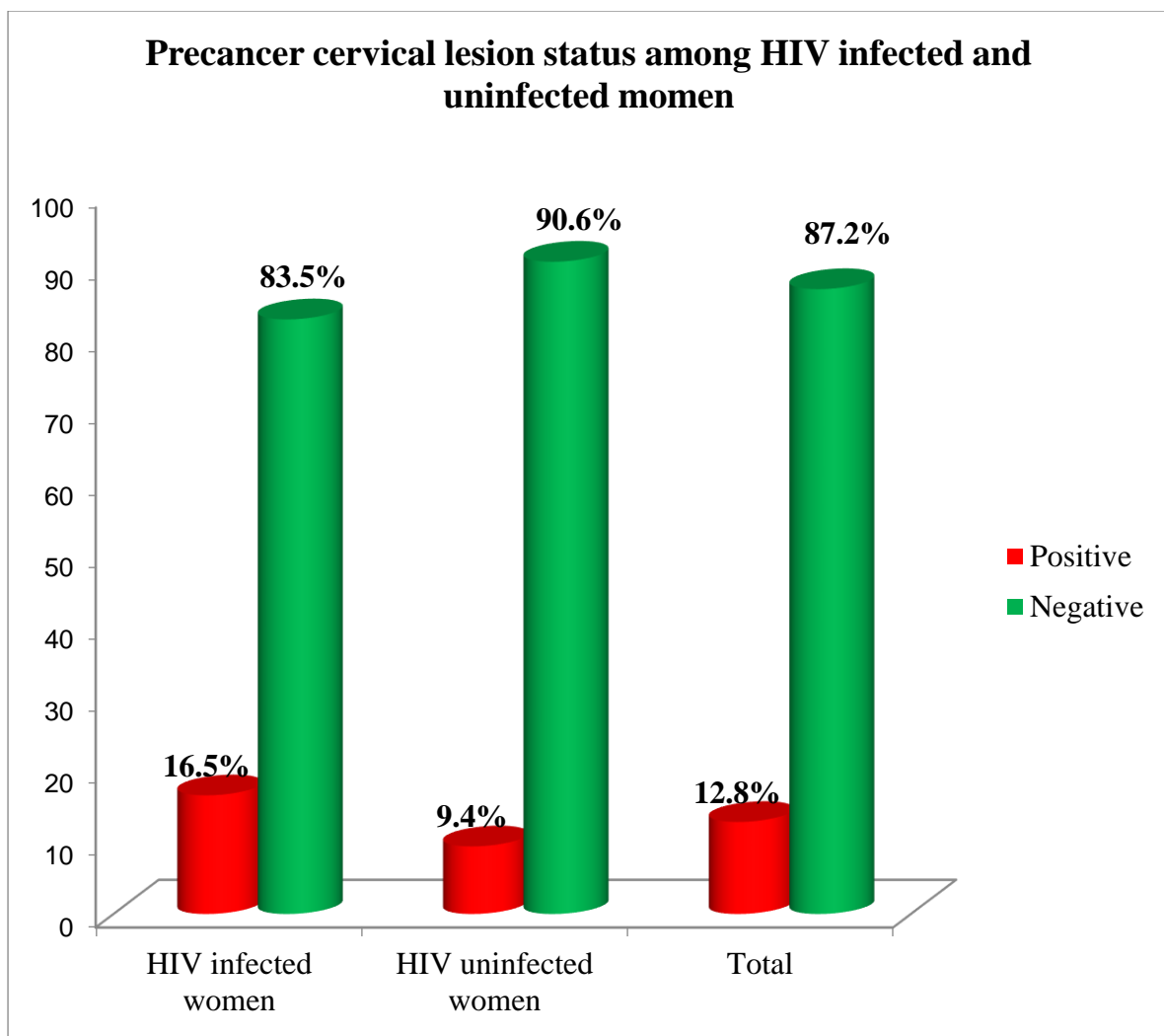


Figure 4: prevalence of pre-cancerous cervical lesion among HIV infected and uninfected women in Bahir Dar city, North, west, Ethiopia/2022.

5.5. Bivariate and Multivariate analysis of factors Associated with Precancerous Cervical Lesion among HIV infected and uninfected women in Bahir Dar city, North West, Ethiopia/2022

In Bivariable analysis, educational status, marital status, HIV status, age at first sex, history of STIs, number of lifetime sexual partner, number of birth and type of contraceptive of the respondents were found to have a p-value of ≤ 0.2 . And to control the effect of other confounding factors they were entered into multivariable logistic regression analysis. In the multivariable analysis, educational status, HIV status, initiation of sexual intercourse before 18 years old, having a history of STIs, Number of pregnancy, History of abortion and multiple sexual partners in her life time were found to be a significant associated (predictors) with precancerous cervical lesion among HIV infected and uninfected women. Women who had unable to write and read and grade one up to eight were 6.3 and 2.6 times (AOR =6.39:95% CI (2.92, 13.98)) and AOR =2.61:95% CI (1.08, 6.32)) more likely to have precancerous cervical lesions compared with those who had diploma and above educational level. Women living with HIV 1.9 times (AOR =1.93:95% CI (1.11, 3.37)) more likely to have precancerous cervical lesions than those who had HIV uninfected. Similarly, those who had early initiated sexual intercourse before the age of 18 were 2.6 times (AOR = 2.67: 95% CI (1.55, 4.59)) more likely to have the lesion compared with those who initiated sexual intercourse at the age of 18 years and late. Women who had history of STDs were 3.7 times more likely to have precancerous cervical lesions than those who had no history of STD (AOR =3.7:95% CI (2.14, 6.14)). Similarly, those having two or more lifetime sexual partners were 3 times (AOR=3.05: 95% CI (1.76, 5.29)) higher to develop cervical precancerous lesion. women who had more than two times history of pregnancy in her life time were 3.3 times (AOR =3.32:95% CI (1.9, 5.81)) more likely to have precancerous cervical lesions compared to those who had no history of more than two number of pregnancy women. And women who had history of abortion were 2.3 times (AOR =2.32:95% CI (1.33, 4.1)) more likely to have precancerous cervical lesions compared to those who had no history of history of abortion women. (Table 5).

Table 4: Bivariate and Multivariate analysis of factors associated with precancer cervical lesion among HIV infected and uninfected women at Bahir Dar City, North, West Ethiopia,2022 (n=697)

Variables	Category	Precancer cervical lesion status		COR at 95% CI	AOR at 95% CI	P-value
		Positive n=89	Negative n=608			
Educational status	Unable to read and write	44	117	6.14 (3.11, 12.1) **	6.39 (2.92, 13.98)	<0.001
	Grade 1-8	18	109	2.69 (1.25, 5.8) **	2.61 (1.08, 6.32)	0.032
	Grade 9-12	15	186	1.31 (0.6, 2.88)	1.23 (0.51, 2.96)	0.631
	Diploma and above	12	196	1	1	1
Marital status	Single	13	85	1.76 (0.85, 3.6)	1.90 (0.81, 4.50)	0.140
	Divorced	31	122	2.92 (1.6, 5.23) *	1.82 (0.91, 3.68)	0.091
	Widowed	22	136	1.86 (1.03, 3.46)	1.27 (0.61, 2.68)	0.519
	Married	23	265	1	1	1
HIV status	Positive	55	279	1.90 (1.21, 3.01) **	1.93 (1.11, 3.37)	0.019
	Negative	34	329	1	1	1
Sexual transmitted disease	Yes	57	166	4.74(2.96, 7.57) **	3.70 (2.14, 6.14)	< 0.001
	No	32	442	1	1	1
History of abortion	Yes	59	237	3.07(1.92,4.92) **	2.32 (1.33, 4.1)	0.003
	No	30	371	1	1	1
Number of pregnancies	>2	62	200	4.68 (2.89, 7.59) **	3.32 (1.90, 5.81)	< 0.001
	≤2	27	408	1	1	1
Number of sexual partners in her life time	≥2 sexual partners	58	211	3.52 (2.2, 5.61) **	3.05 (1.76,5.29)	<0.001
	<2 sexual partner	31	397	1	1	1
Age of first sexual relation/contact	< 18 years	51	200	2.79 (1.76, 4.4) **	2.67 (1.55, 4.59)	<0.001
	≥ 18 years	38	408	1	1	1

Foot note - *p<0.2, **p<0.05

5.6. Factors Associated with Precancerous Cervical Lesion among HIV infected women in Bahir Dar city north west Ethiopia/2022

In the multivariable analysis, education status illiterate and grade 1-8, initiation of sexual intercourse before 18 years old, having a history of STIs, having history of multi pregnancy, share under wears/pants with families and friends and multiple sexual partners in her life time were found to be a significant associated (predictors) with precancerous cervical lesion among HIV infected women.

Women who had history of illiterate were 9.79 times (AOR =9.79:95% CI (3.40, 28.13)) more likely to have precancerous cervical lesions than those women who had history of high school and above.

Women who had history of Sexual transmitted disease were 3.94 times (AOR =3.94:95% CI (1.94, 7.99)) more likely to have precancerous cervical lesions than those who had no history of STD. Furthermore, who had history of multiple sexual partners in her life time (two or more sexual partners) were 2.58 times (AOR = 2.58: 95% CI (1.25, 5.28)) more likely to develop pre-cancerous cervical lesion. Similarly, those who had early initiated sexual intercourse before the age of 18 were 2.1 times (AOR = 2.12: 95% CI (1.04, 4.31)) more likely to have lesion compared those who had initiated sexual intercourse at the age of 18 years and late. (Table 6)

Table 5: Bivariate and Multivariate analysis factors associated with precancer cervical lesion among HIV infected women at Bahir Dar City, North, West Ethiopia,2022 (n=334)

Variables	Category	Precancer cervical lesion status		COR at 95% CI	AOR at 95% CI	P-value
		Positive n=55	Negative n=279			
Educational status	Unable to read and write	27	47	8.52 (3.28, 22.1) **	9.79(3.40, 28.13)	< 0.001
	Grade 1-8	13	45	4.28(1.52, 12.02) **	3.54 (1.13, 11.1)	0.030
	Grade 9-12	9	98	1.36(0.46, 3.98)	1.27(0.40, 4.04)	0.678
	Diploma and above	6	89	1	1	1
Marital status	Single	9	40	1.83 (0.73, 4.55)	1.1 (0.34, 3.28)	0.906
	Divorced	18	67	2.18 (1.02, 4.68) **	1.14 (0.44, 2.92)	0.78
	Widowed	14	58	1.96 (0.87, 4.39)	0.99 (0.37, 2.67)	0.99
	Married	14	114	1	1	1
Age of first sexual relation/contact	< 18 years	31	113	1.89 (1.058, 3.43) *	2.12 (1.04, 4.31)	0.037
	≥18 years	24	166	1	1	1

Sexual transmitted disease	Yes	34	74	4.48(2.44, 8.21) *	3.94(1.94, 7.99)	<0.001
	No	21	205	1	1	
History of abortion	Yes	35	116	2.45(1.35,4.47) **	1.27 (0. 58, 2.76)	0.516
	No	20	163	1	1	1
Number of sexual partners in her life time	≥ 2 sexual	34	106	2.64(1.45, 4.79) **	2.58(1.25, 5.28)	0.010
	<2 sexual partner	21	173	1	1	1
Number of pregnancy	>2	38	87	4.93(2.63, 9.22) **	4.13 (2.02,8.43)	<0.001
	≤ 2	17	192	1	1	1
Share under wear/pant	Yes	30	108	1.90 (1.06,3.40) **	2.50 (1.26, 5.16)	0.013
	No	25	171			1

Foot note - * $p < 0.2$, ** $p < 0.05$

5.7. Factors Associated with Precancerous Cervical Lesion among HIV uninfected women in Bahir Dar city north west Ethiopia/2022

In the multivariable analysis women who had history of illiterate, initiation of sexual intercourse before 18 years old, history of more than two times happen of pregnancy, history of multiple partners and share under wear/pant/ with families/friends were found to be a significant associated (predictors) with precancerous cervical lesion among HIV uninfected women. Women who had history of unable to read and write in educational status were 3.7 times more (AOR =3.75:95% CI (1.14, 12.34)) more likely to have precancerous cervical lesions than compared those who had grade one up to eight and above. Similarly, women who had history of more than two times happen of pregnancy in her life time were 4.7 times (AOR=4.79: 95% CI (2.02, 11.32)) more likely to develop pre- cancerous cervical lesion as compared to who had history of less than and equals to two happened of pregnancy women. Furthermore, who had history of share under wear/pant/ with families/friends were 3.8 times (AOR = 3.87: 95% CI (1.64, 9.12)) more likely to have pre-cancerous cervical lesion. Similarly, those who had early initiated sexual intercourse before the age of 18 years were 3.5 times (AOR = 3.58: 95% CI (1.58, 8.09)) more likely to have the lesion compared with those who had initiated sexual intercourse at the age of 18 years and late and also, those who had history of multiple sexual partners in her life time were 4.6 times (AOR = 4.6: 95% CI (1.99, 10.71)) more likely to have the lesion compared with those who had no history of multiple sexual partners in her life time. ((Table 7)

Table 6: Bivariate and Multivariate analysis of factors associated with precancer cervical lesion among HIV uninfected women at Bahir Dar City, North, West Ethiopia,2022 (n=363)

Variables	Category	Precancer cervical lesion status		COR at 95% CI	AOR at 95% CI	P-value
		Positive n=34	Negative n=329			
Educational status	illiterate	17	70	4.33 (1.62, 11.52) **	3.75 (1.14, 12.3)	0.030
	Grade 1-8	5	64	1.39(0.41, 4.75)	1.73 (0.41, 7.17)	0.449
	Grade 9-12	6	88	1.21(.38, 3.88)	1.42 (0.37, 5.14)	0.607
	Diploma & above	6	107	1	1	1
Marital status	Single	4	45	1.49 (0.43,5.07)	2.96 (0.70,12.51)	0.139
	Divorced	13	55	3.96 (1.6,9.79) *	2.68 (0.89,8.06)	0.079
	Widowed	8	78	1.72 (0.63, 4.63)	1.58 (0.50,5.03)	0.434
	Married	9	151	1	1	1
Age of first sexual relation	< 18 years	21	90	4.21(2.01, 8.82) **	3.58(1.58, 8.09)	0.002
	≥18 years	13	239	1	1	1
Previously cervical cancer screened	Yes	5	107	0.35(0.13, 0.95) *	0.6(0.20, 1.86)	0.399
	No	29	222	1	1	1
Number of sexual partners in her life time	≥2 sexual partners	24	105	5.12(2.36, 11.09) **	4.61(1.99, 10.71)	<0.001
	<2 sexual partner	10	224	1	1	1
Number of pregnancies	>2	17	87	4.58 (2.12, 9.92) **	4.79(2.02, 11.32)	<0.001
	≤2	17	242	1	1	1
share under wear with families and friends	Yes	25	121	4.77(2.15, 10.56) **	3.87(1.64, 9.12)	0.002
	No	9	208	1	1	1

Foot note - *p<0.2, **p<0.05

5.8. Common statistical associated variables for both HIV infected and uninfected women in each regression analysis

From this study, in each individual logistics regression analysis, showed both common statistical associated variables were illiterate educational status, initiation of sexual relation before 18 years, history of multiple sexual partners, more than two history of pregnancy and share under wear / pant with families and friends statically associated factor with precancer cervical lesion. However, for HIV infected women differently additional statistical associated variables were sexual transmitted disease compared that in HIV uninfected women.

6. Discussion

This study, assessed the proportion of pre-cancerous cervical lesion among HIV infected and HIV uninfected in health institution at Bahir Dar city. In this study, the proportion of HIV infected women had a higher pre-cancerous cervical lesion 16.5% (95% CI: 12.7, 20.5) relative to HIV-negative women 9.4% (95% CI: 6.4, 12.4) ($p= 0.021$). HIV infected women's might be the reason due to adherence of highly active antiretroviral treatments and immunity compromise in case of HIV virus for such comparable findings in the study area (60).

This result is in line with a similar study done in Debre Tabor Hospital where it showed that the proportion of pre-cancerous cervical lesion among HIV infected was higher (9.3% (95% CI; 9.26, 9.44)) than uninfected women (8.6: (95% CI; 8.54, 8.71)) (37). And in other similar studies done in Democratic Republic of Congo, Swaziland, Tanzania and Kenya show that higher proportion of cervical lesion among HIV infected women were 31.3 %, 22.9%, 71.8%, 27.1 and 42% than compare with among HIV uninfected women (3.9 %, 5.7%, 27.3% and 19%) respectively (42, 49-51). The possible reason for this discrepancy might be to differences in demographics of the study participants, variation in lesion detection techniques, population immune difference, urbanization, time of HIV screening immediate or late and a difference in adherence of antiretroviral treatment. In case of this the prevalence of PCCL has high difference relatively from this study (37).

In this study, the overall prevalence of pre-cancerous cervical lesion among HIV-infected and uninfected women was found to be 12.8 % (95% CI; 10.3, 15,2). In consistency of this finding, study done in Gahandi Memorial Hospital (14.6%) (39). However, it was higher than studies conducted in Debre Tabor hospital (8.8), Rwanda (5.9%) (47), Cameroon (3.33%) (48). In oppositely, the current study finding was lower than other study conducted in saint Paul's hospital (24.1%) (41), Adamma Hospital (15.7%) (54).

The possible justification for this difference could be the difference of study area, period and sample size and study population of the study participants, variation in lesion detection techniques, population immune difference, urbanization, time of HIV screening late and a difference in adherence of antiretroviral treatment. And also, use of different definitions of precancer cervical lesion and difference in diagnostic tests in different settings, a difference in adherence to antiretroviral treatment, the difference in the study facilities and might be due to resource disparity. It could also be attributed to the difference in the availability of skilled workers. In case of this the prevalence of PCCL has high difference relatively from this study (60-62).

In this study, different factors were identified to associate with pre-cancerous cervical lesion. This comparative study shows that sexual transmitted disease was differently statically associated factors with PCCL in HIV infected women compared that HIV uninfected women. The finding of this study showed that women who had unable to read and write were at a higher risk of developing precancer cervical lesions than those whose educational level diploma and above. Current result of this study was supported with studies conducted in Debre tabor hospital, Harary, Kenya and Saudi Arabia which revealed that women who had unable to read and write were a higher risk to develop pre-cancerous cervical lesion.(37, 42, 43, 46)

The possible justification for this might be that those women who had not information about the disease, prevention mechanism and mode of transmission. Because illiterate women not read any information holder posters, magazines, books and poor understanding all audio and visual information's. Due to this reason her exposed rate increases relatively compared to, secondary school and above (62). Oppositely, the result of this study was different from the study conducted in Debre Markos, Adamma, Ruanda, Cameroon and China there were no difference among women literate and illiterate. The reason behind this might be use different sample size, methods, economical level. (38, 40, 41, 47, 54)

This study also showed that women lived with HIV have more likely risk for precancer cervical lesion compared to HIV negative women.

Possible justification of the reason due to immune compromised of a virus and highly active antiretroviral treatment might be exposed for opportunistic infections. From those, HPV the first opportunistic infection (60). Oppositely other study conducted in Debre tabor living with HIV not a risk for Precancer cervical lesion (37).It might be the reason of this previous study the first one use small sample size, source of data secondary (in case of this have incompleteness of data) and used only one hospital for data collection. Due to this reason this interesting variable not associated with PCCL. The current study showed that women who had a history of sexual transmitted disease were more likely to have pre-cancerous cervical lesion compared to no history of STD. This is supported by the study done in East Gojjam, Adamma hospital, Swaziland, China Saudi Arabia which is revealed that women who had a history of STD was a higher risk to develop precancer cervical lesion compared that who had no history of STD (36, 38, 46, 50, 54). The possible justification of the reason due to her cervical os was inflamed for a long time as a result of exposure to STDs, and this inflamed area provided comfort for normal flora as well as HPV growth and multiplication as well as other exposed causative agents, which may have increased her risk of developing a precancerous cervical

lesion (63). However this study result, other study conducted in Debre tabor hospital (37), Debre Markos hospital (40) and Kenya (42). This possible reason, women who had known her HIV status this might protect them from STD because during HIV screening and ART follow up during this time, they got information about prevention of STD.

In this study also showed that women who had greater than or equals to two sexual partners in her life time were at higher risk of developing precancer cervical lesion than women who had history of only one sexual partner in her life time. This finding is agreed with the previous study done in East Gojjam, Gahandi memorial hospital, Cameroon, Democratic republic of Congo, Swaziland, China Saudi Arabia which is revealed that women who had a history of multiple sexual partners was a higher risk develop precancer cervical lesion compared that who had no history of multiple sexual partner (36, 38, 39, 43, 48-50). Possible justification of the reason more than one sexual partner has high contamination rate during different sexual partners contact due to this interesting reason HPV transmission increased. Because human papilloma virus a highly pathogenic disease, due to this reason who had history of multiple sexual partners increase the risk of precancer cervical lesions (64).

This study finding, also showed that women who initiated first sexual contact/relation before age of 18 years were more likely to develop precancer cervical lesions compared that who initiated sexual contact on age of 18 or late 18 years. The finding of current study was supported with studies conducted in east Gojjam, Addis Abeba Paul's hospital, Gahandi memorial hospital, Ruanda and China in which women who had a history of performed sexual intercourse before the age of 18 years were more developing pre-cancerous cervical lesion than the time of first sexual contact at age of 18 years or above 18 years (36, 38, 41, 47).

The possible explanation for this might be because of Before the age of 18 years, beginning sexual activity might raise the chance of developing a precancer cervical lesion. because having early sexual contact increases the likelihood of cervix tissue damage, cervix enlargement, cervix alteration, and HPV exposure, which also increases the risk of precancer cervical lesions. These changes increase the area's susceptibility to attack. (65). However, the result of this study was different from the study conducted in Debre Markos, Kenya and Swaziland in which studies were no difference among women who initiated first sexual intercourse before age of 18 years and \geq 18 years. The possible justification of the might be the difference sample size, socio demographic differences and any other confounding variables (40, 42, 50).

In this study also showed that women who had history of abortion in her life time were at higher risk to develop precancer cervical lesion than women who had no history of abortion in her life time. This

finding was supported with the study done in Democratic Congo, which is revealed that women who had history of abortion was a higher risk to develop precancer cervical lesion compared that who had no history of abortion.

This study's rationale might be that precancer cervical lesions are more likely to develop in women with a history of abortion. Because there is a potential of tool and hygiene-related contamination in the event of abortion, the rate of HPV transmission is higher at this time compared to when there has never been an abortion. (66, 67).

However, the result of this study was different from the study conducted in Debre Markos, Kenya and Swaziland in which studies were no difference among women who had history of abortion and no history of abortion. The possible reason might be difference in socio demographic, sample size, study area, study design.

7. Strength and Limitation of the Study

This study was provided valuable evidence regarding the proportion of precancer cervical lesion and possible associated factors between HIV infected and uninfected women, it could not avoid the chicken-egg dilemma. There was also a limitation of this study in case of comparative study some variables in HIV infected women excluded in this study like: CD4 cell, duration of AR, husband sexual history during data collection has some doubts, because how many women told the truth? The quantity of alcohol consumption in rural communities is the final limitation on alcohol measurement criteria in established standards. I don't agree with this recommendation because they drink "Tela" instead of reliable water on a regular basis, but this variable is backed by other research, thus it was included in the study. But it was another one of this study's limitations.

8. Conclusion and Recommendations

8.1. Conclusion

This study result, prevalence of precancer cervical lesion had showed high discrepancy between HIV infected and uninfected women with a statically significant variation between HIV infected and uninfected women, which was one point nine times higher risk in HIV infected women than HIV uninfected women. And this study confirms that illiterate women, HIV positive, initiation of sexual intercourse before 18 years, having a history of STIs, having history of multi pregnancy, history of abortion and multiple sexual partners in her life time were statically associated factors with pre-cancerous cervical lesions.

8.2. Recommendations

Based on the findings, the following recommendations were made:

❖ **To Bahir Dar city zone health department**

- ✓ Zonal health department strongly work together with stake holder to promote and support for community about one-to-one sexual partner.
- ✓ Recommend to work about sexual transmitted disease prevention by using religion leaders and community mobilization by using like: drama, distribute of inflates, posters, etc. and promote condom utilization.
- ✓ Recommend to work on community mobilization about prevention of early initiation of sexual relation before 18 years by using peer-to-peer education service, school clubs and religion leaders.

❖ **Non-governmental organization**

- ✓ This department work strongly on functionality of youth friendly service program in everywhere in health institution and in youth recreation area. To promote condom utilization, to prevent STD and for other related purposes.

❖ **To Bahir Dar city zone educational department**

- ✓ Zonal educational department strongly address formal educational services for community. Because in this study illiterate women more risk for precancer cervical lesion.

❖ **To health institutions and health care providers**

- ✓ All health institution should support and supervise health extension workers to mobilization community for Prevention of cervical cancer and HIV. Because both disease co-morbidity in maternal health.
- ✓ All health institution promotes all other medical comer clients and patients to get access of service and awareness about precancer cervical screening.
- ✓ Work on community about prevention of early sexual initiation, sexual transmitted disease.

❖ **To Bahir Dar city community**

- ✓ All women must be limiting her number of sexual partner. which means recommend one to one sexual partner.

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10. Annex

10.1. English Version

Annex I: Information sheet and Consent form

Hi, my name is Mulugeta Yaze, here, at Bahir Dar University, college of Medicine and Health Science, school of public health department of reproductive health and population study, will be conducting research at Bahir Dar city governmental and non-governmental health institution, North West Ethiopia, 2022. Before getting your permission for participation, I will give you all the necessary information regarding the study. Thus, the information will be detailed as;

Purpose of the study: This study aim will be, to assess prevalence and associated factors of pre-cancerous cervical lesion among HIV-infected and HIV-uninfected women at health institutions in Bahir Dar city, north west, Ethiopia/2022.

Risk: The study will be carried out by asking your permission with already prepared and structured questionnaire. There will be no physical or psychological harm during the procedure. Besides, you have full right to stop any time you wish and you won't be obliged to give any information which you don't want to answer.

Benefits: For being involved in this study, there is no payment you will be granted with and no special privilege is also given to you. Perhaps, participating and giving information for the questions being asked plays a vital role.

Confidentiality: Any information you give will be kept confidential and won't be accessible to any third party. Your name no mentions anywhere. The information you give is only use for research purpose only.

Principal investigator: Name Mulugeta Yaze, Sign....., Date_____.

Contact address: Bahir Dare Cell phone: +251948809810

E-mail: mulerryazee@gmail.com

Advisor name Dr. Alemtsehay Mekonnen, Signature Date.....

Advisor name Mr. Endalkachew Worku, Signature Date.....

Consent form: You participation in this study will totally be on the basis of your willingness. You can stop anywhere you wish to stop participation, even from the very beginning. No one will force you to give information you don't want to give.

I assure you that your name will not be mentions in anywhere. Filling the questionnaire will take about 30 minutes. The information that you give me will be kept confidential and not be accessible to a third party; only be used for the research purpose. Can I have your permission to continue?

1. Yes 2. No.

Stop and thank the respondent.

Finally, I duly acknowledge your participation and either response Finally, I duly acknowledge your participation and either response

Witness: Signature _____ Date _____

Data collector: Name _____

Signature _____ Date _____

ANNEX- 3 QUESTIONNAIRES

PART ONE: SOCIO-DEMOGRAPHIC RELATED FACTORS

No	Question	Category/Answers	Remark
101	How old are you?	_____ Years	
102	What is your Marital status?	<ol style="list-style-type: none"> 1. Single 2. Married 3. Divorced 4. Widowed 	
103	What is your Religion?	<ol style="list-style-type: none"> 1. Orthodox 2. Muslim 3. Protestant 4. Others, specify.... 	
104	What is your ethnicity?	<ol style="list-style-type: none"> 1. Amhara 2. Oromo 3. Tigre 4. Other 	
105	What is your educational status?	<ol style="list-style-type: none"> 1. Unable to read and write 2. Grade 1-8 3. Grade 9-12 4. Diploma and above 	
106	What is your occupation?	<ol style="list-style-type: none"> 1. Governmental employee 2. Merchant 3. House wife 4. Farmer 5. Student 6. Commercial sex worker 	
107	Where is your residence?	<ol style="list-style-type: none"> 1. Urban 2. Rural 	

PART-TWO-REPRODUCTIVE HEALTH-RELATED FACTORS

No	Question	Category/Answers	Remark
201	Are you Contraceptive user?	1. Yes 2. No	If your answer No skip to question 204
202	If yes which type of contraceptive used?	1. Pills 2. Injectable 3. Implant 4. IUCD	
203	Duration of contraceptive used	1. < 2 years 2. 2-5 years 3. > 5 years	
204	What is Your history of menstruation pattern?	1. Regular (21-35 days) 2. Irregular (<21 or >35 days)	
205	Number of pregnancy?	_____	
206	Number of children?	_____	
207	Your age at first birth?	_____years	
208	Do you have history of abortion?	1. Yes 2. No	If your answer No skip to question 210
209	If yes how many times occur	_____times	
210	Do you have history of sexual transmitted infection?	1. Yes 2. No	
211	HIV Status	1. Positive 2. Negative	
212	current precancerous cervical lesion status?	1. Positive 2. Negative	
213	Previously are you screened cervical cancer?	1. Yes 2. No	If your answer No skip to question 215
214	If yes when you screened?	1. Within 5 years 2. Before 5 years	
215	If no in question 214 why?	1. I don't know about screening 2. No need of screening 3. Unable to get access of screening	

PART THREE- SEXUAL BEHAVIOR RELATED FACTORS

No	Questions	Category/Answers	Remark
301	Your age at first sexual relation/contact?	_____years	
302	How many sexual partners do you have in your life time?	_____partners	
303	How often do you used condom during sexual relation?	<ol style="list-style-type: none"> 1. Every sexual contact 2. Sometimes 3. Never 	
304	Do you know your husband sexual partner history?	<ol style="list-style-type: none"> 1. Yes 2. No 	
305	If your answer “yes” how many sexual partners do you know?	_____partners	

PART FOUR- LIFE STYLE AND HYGIENIC RELATED FACTORS

No	Questioner	Category/Answers	
401	Do you have history of alcohol drinking?	<ol style="list-style-type: none"> 1. Yes 2. No 	If your answer no skip to question 404
402	If “Yes” what type of alcohol drink	<ol style="list-style-type: none"> 1. Tela 2. Beer 3. Wein 4. Others 	
403	How many bottle drink per day	<ol style="list-style-type: none"> 1. One bottle (355 m.l) 2. Two bottles (710 m.l) 3. Three bottles (1065 m.l) 4. Greater than three bottles (>1065 m.l) 	
404	Do you share under wear with families and friends	<ol style="list-style-type: none"> 1. Yes 2. No 	
405	How many times clean your genital area per day?	<ol style="list-style-type: none"> 1. One time 2. Two times 3. More than two times 	
406	What type of solution use for cleaning	<ol style="list-style-type: none"> 1. Water only 2. Water with soap 	

Data collector: Name..... Date.....

Checked by supervisor: Signature..... Date.....

10.2. Amharic Version

አባሪ

አባሪ 1: የመረጃ መሰብሰቢያ እና የመስማሚያ ቅጽ

ሰላም ነዎት እኔ እዚህ ላይ የተሰየምሁት ተማሪ _____ በባህር ዳር ዩኒቨርሲቲ ፣ በሕክምና እና በጤና ሳይንስ ኮሌጅ ፣ በማህበረሰብ ጤና ስነ-ተዋለዶ እና ስነ-ህዝብ ትምህርት ክፍል ውስጥ የሁለተኛ ዲግሪ ተማሪ ነኝ፣ በሰሜን ምዕራብ ፣ ኢትዮጵያ / 2014 ዓ.ም በባህር ዳር ከተማ በሚገኙ የጤና ተቋማት ውስጥ በኤች አይ ቪ በተጠቁ እና በኤች አይ ቪ ባልተያዙ ሴቶች መካከል የቅድመ ካንሰር የማኅጸን ህዋስ በሽታ እና ተጓዳኝ ምክንያቶች ላይ ምርምር አካሂዳለሁ። በዚህም መሰረት በባህርዳር ከተማ በማካሂደው ምርምር የተሳትፎ ፈቃድዎን ከማግኘቴ በፊት ጥናቱን በተመለከተ ሁሉንም አስፈላጊ መረጃዎች እስጥዎታለሁ። ስለዚህ መረጃው እንደሚከተለው በዝርዝር ተቀምጧል።

የጥናቱ ዓላማ:- በሰሜን ምዕራብ ፣ ኢትዮጵያ / 2014 ዓ.ም በባህር ዳር ከተማ በሚገኙ የጤና ተቋማት ውስጥ በኤች አይ ቪ በተጠቁ እና በኤች አይ ቪ ባልተያዙ ሴቶች መካከል የቅድመ ካንሰር የማኅጸን ህዋስ በሽታ እና ተጓዳኝ ምክንያቶች ላይ ምርምር ማካሄድ ነው።

ስጋት:- ጥናቱ የሚከናወነው ቀደም ሲል በተዘጋጀ እና በተዋቀረ መጠይቅ ፈቃድዎን በመጠየቅ ነው። በሂደቱ ወቅት አካላዊ ወይም ሥነ ልቦናዊ ጉዳት አይኖርም። በተጨማሪም ፣ በፈለጉት ጊዜ ሁሉ የማቆም ሙሉ መብት አለዎት እናም መልስ መስጠት የማይፈልጉትን ማንኛውንም መረጃ የመስጠት ግዴታ የለዎትም።

ጥቅሞች:- በዚህ ጥናት ውስጥ ለመሳተፍ እርስዎ የሚሰጥዎት ክፍያ የለም እንዲሁም ለእርስዎ ልዩ መብትም አይሰጥም። ምናልባትም ለተጠየቁት ጥያቄዎች መሳተፍ እና መረጃ መስጠት ለጥናቱ ወሳኝ ሚና ይጫወታል።

ምስጢራዊነት:- እርስዎ የሚሰጡት ማንኛውም መረጃ ሚስጥራዊ ሆኖ እንዲቆይ ይደረጋል እና ለማንኛውም ሶስተኛ ወገን ተደራሽ አይሆንም። ስምህ በየትኛውም ቦታ አይጠቅስም. የሚሰጡት መረጃ ለምርምር ዓላማ ብቻ ና ብቻ ነው የሚያገለግለው።

የተመራማሪው ስም ሙሉንታ ያዜ፣ ፊርማ _____ ቀን _____

አድራሻ: ባህርዳር የሞባይል ስልክ: +251948809810

ኢ-ሜል: mulerryazee@gmail.com

የአማካሪ ስም ዶ/ር አለምፀሀይ መኮነን -ፊርማ ቀን.....

የአማካሪ ስም መምህር እንዳልካቸው ወርቁ -ፊርማ ቀን.....

ስምምነት፡-በዚህ ጥናት ውስጥ የእርስዎ ተሳትፎ ሙሉ በሙሉ በፍቃደኝነትዎ ላይ የተመሠረተ ይሆናል። ከመጀመሪያው እስከ መጨረሻው እንኳን ተሳትፎን ለማቆም በፈለጉት ጊዜ ሁሉ ማቆም ይችላሉ። መስጠት የማይፈልጉትን መረጃ እንዲሰጡ ማንም አያስገድድዎትም።

ለመስጠት ምቹት ከሞሉ እባክዎን ይህን ለማድረግ በፈለጉት ጊዜ ሁሉ ለመጣል ነፃነት ይሰጣል። ስምሽ በየትኛውም ቦታ እንደማይጠቀስ አረጋግጣለሁ. መጠይቁን መሙላት 30 ደቂቃ ያህል ይወስዳል. የሰጠኝ መረጃ ሚስጥራዊ ሆኖ የሚቆይ እና ለሶስተኛ ወገን ተደራሽ አይሆንም ።

ለምርምር ዓላማ ብቻ ጥቅም ላይ ይውላሉ። ስለዚህ ለቃለ መጠይቁ ፍቃደኛ ነዎት?

- 1. ፈቃደኛ ነኝ
- 2. ፈቀደኛ አይደለሁም

በመጨረሻም ፣ ተሳትፎዎን እና ሁለቱንም ምላሽ በደንብ እቀበላለሁ።

ስለሰጡኝ መልስ አመሰግናለሁ።

የምስክርነት፡ ፊርማ _____ ቀን _____

የመረጃ ሰብሳቢ፡ስም _____ ፊርማ _____ ቀን _____

አባራ- 2 ጥያቄዎች

ክፍል አንድ: ሶስቱ ዲሞክራሲክ ተያያዥ ምክኒያቶች

ተ.ቁ	ጥያቄ	ምድብ / መልሶች	
101	ዕድሜዎ ስንት ነው ?	_____ አመት	
102	የጋብቻ ሁኔታሽ ምንድን ነው?	<ol style="list-style-type: none"> 1. ያላገባች 2. ያገባች 3. የተፋታች 4. ጋለሞታ 	
103	የምታመለከቡት እምነትሽ ምንድን ነው?	<ol style="list-style-type: none"> 1. ኦርቶዶክስ 2. ሙስሊም 3. ፕሮቴስታንት 4. ሌሎች እምነቶች ከሆኑ ይግለፁ 	
104	ብሄርሽ ምንድን ነው?	<ol style="list-style-type: none"> 1. አማራ 2. ኦሮሞ 3. ትግሬ 4. ሌላ ካለ ይግለፁ 	
105	የትምህርት ደረጃዎ ምንድን ነው??	<ol style="list-style-type: none"> 1. ለማንበብ እና ለመጻፍ አልተቻለም 2. 1-8 ኛ ክፍል 3. 9-12 ኛ ክፍል 4. ዲፕሎማ እና ከዛ በላይ 	
106	የስራ ሁኔታዎ ምንድን ነው?	<ol style="list-style-type: none"> 1. የመንግስት ሰራተኛ 2. ነጋዴ 3. የቤት እመቤት 4. ገበሬ 5. ተማሪ 6. ሌተኛ አዳሪ 	
107	መኖሪያ ቦታዎ የት ነው?	<ol style="list-style-type: none"> 1. ከተማ 2. ገጠር 	

ክፍል: ሁለት - የስነ-ተዋልዶ ጤና ተያያዥ ምክኒያቶች

ተ.ቁ	ጥያቄ	ምድብ / መልሶች	ምርመራ
201	የእርግዝና መከላከያ ተጠቅመው ያወቃሉ?	1. አወ 2. የለም	መልሷ የለም ከሆነ ወደ ጥያቄ 204 ይሂዱ
202	ምናልባት መልስዎ አዎ ከሆነ ምናይነት ዓይነት የእርግዝና መከላከያ ይጠቀማሉ/ተጠቅመዋል	1. በአፍ ሚዋጡ ክኒኖችን 2. በመርፌ ሚሰጡትን 3. ክንድ ላይ ሚቀበሩትን 4. በማህፀን ውስጥ ሚቀመጠውን	
203	ለምን ያክል ጊዜ የርግዝና መከላከያ ተጠቀምሽ	1. ከ 2 አመት በታች 2. ከ 2-5 አመት 3. ከ 5 አመት በላይ	
204	የወር አበባዎ የአመጣጥ ታሪክ በየወሩ ምን ይመስላል ?	1. መደበኛ (21-35 ቀን) 2. ኢ-መደበኛ (ከ21 ቀን በታች እና 35 ቀን በላይ) 3. ምንም የወር አበባ አላየሁም	
205	በሂዎት ዘመንዎት ስንት ጊዜ አርግዘዋል?	_____ ጊዜ	
206	የመጀመሪያ ልጅሽን በስንት አመትሽ ነው የወለድሽ?	_____ አመቱ	
207	ስንት ልጅ አለዎት?	_____ ልጅ	
208	በእርግዝና ጊዜ እርስዎ ፈልገው ወይም በራሱ ጊዜ ወርጃ አጋጥሞዎት ያወቃል ?	1. አወ 2. የለም	መልሷ የለም ከሆነ ወደ ጥያቄ 210 ይሂዱ
209	መልስዎ አዎ ከሆነ ስንት ጊዜ አጋጠመዎት	_____ ጊዜ	

210	ከዚህ በፊት የአባላዘር በሽታ ታመሽ ታወቁያለሽ?	1. አወ 2. የለም	
211	የ ኤችአይቪ ምርመራ ወጤቷ ምን ነበር?	1. ቫይረሱ በደሟ ወሰጥ አለ 2. ቫይረሱ በደሟ ወሰጥ የለም	
212	የአሁን የቅድመ ማህፀን በር ካንሰር የምርመራ ወጤቷ ምን ነበር?	1. አለባት 2. የለባትም	
213	ከዚህ በፊት የማህፀን በር ካንሰር ምርመራ አድርገው ያወቃሉ?	1. አወ 2. የለም	መልሷ የለም ከሆነ ወደ ጥያቄ 215 ይሂዱ
214	መልስወ አወ ከሆነ መቸ አደረጉ?	1. በዚህ 5 አመት ውስጥ 2. ከ 5 አመት በፊት	
215	በጥያቄ ቁጥር 213 ላይ መልስዎ የለም ከሆነ ለምን?	1. ስለምርመራው ስለማላወቅ 2. ለመመርመር ስለማለፊልግ 3. የመመርመሪያ ቦታ እና እድሉን ስላጣሁ	

ክፍል ሶስት፡- የታዊ ግንኙነት ጋር የተያያዙ ምክኒያቶች

ተ.ቁ	ጥያቄዎች	ምድብ / መልሶች	
301	የመጀመሪያ ግብረ ስጋ ግንኙነት በስንት አመትዎት ነው ያደረጉት?	በ_____ አመቱ	
302	በሂዎት ዘመንሽ ስንት የወሲብ ጓደኞች ነበሩሽ	_____ የወሲብ ጓደኛ	
303	በግንኙነትሽ ወቅት ምን ያክል ጊዜ ኮንዶም ትጠቀሟ ነበር?	1. ሁሌም በግንኙነት ጊዜ እጠቀማለሁ 2. አንዳንድ ጊዜ እጠቀማለሁ 3. በፍፁም አልጠቀምም	
304	ስለ ባለቤትሽ የቀድሞ የወሲብ ታሪክ ታወቁያለሽ?	1. አወቃለሁ 2. አላወቅም	

305	መልስወ አወቃለሁ ከሆነ ከስንት ሴቶች ጋር ተገናኝቷል?	ከ_____ ሴቶች ጋር	
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ክፍል አራት:- የአኗኗር ዘይቤ እና ከንፅህና ጋር ተያያዥ ምክንያቶች

ተ.ቁ	ጥያቄዎች	ምድብ / መልሶች	
401	አልኮል ይጠጣሉ?	1. አወ 2. የለም	መልሷ የለም ከሆነ ወደ ጥያቄ 404 ይሂዱ
402	መልስዎ አወ ከሆነ ምን አይነት አልኮል ነዉ ሚጠጡት?	1. ጠላ 2. ቢራ 3. ወይን 4. ሌሎች	
403	በቀን ምን ያክል ብርጫቆ (ጠርመሱ) ይጠጣሉ?	1. አንድ (355 ሚ.ሊ.) 2. ሁለት (710 ሚ.ሊ.) 3. ሶስት (1065 ሚ.ሊ.) 4. ከሶስት በላይ (ከ1065 ሚ.ሊ. በላይ)	
404	የወስጥ ልብስ (ፓንት) ከንደኛ ወይም ከቤተሰብ ጋር ተቀያይረሽ ለብሰሽ ታወቁያለሽ	1. አወ 2. የለም	
405	በቀን ስንት ጊዜ ብልትሽን ትታጠቢያለሽ?	1. አንድ ጊዜ 2. ሁለት ጊዜ 3. ከሁለት ጊዜ በላይ	
406	የምትታጠቢዉ በምንድን ነዉ?	1. በዉሀ ብቻ 2. በዉሀ እና ሳሙና	

የመረጃ ሰብሳቢ: ስም..... ፊርማ..... ቀን.....

የተቆጣጣሪው ስም..... ፊርማ..... ቀን.....

DECLARATION SHEET

I declare and affirm by my signature that, this thesis entitled proportion and associated factors of pre-cancerous cervical lesion among HIV-infected and HIV-uninfected women at health institutions in Bahir Dar city, North West, Ethiopia/2022: Institutional based Comparative cross-sectional study is my original work and all the sources that I have used throughout the thesis have been indicated and acknowledged using complete references.

Name of Student: Mulugeta Yaze (BSc.)

Signature _____ Date ____/____/____

This work has been submitted with my approval as an advisors and examiner:

Name of advisor: **1.** Dr. Alemtsehay Mekonnen (Associated professor and PhD)

Signature _____ Date ____/____/____

Name of advisor: **2.** Mr. Endalkachew Worku (Ass. Professor and PhD Candidate)

Signature _____ Date ____/____/____

Name of examiner: Mr. Melash Belachew (Ass. Professor and Mph in Rh)

Signature _____ Date ____/____/____

Name of department head: Dr. Eleni Mersha (Ass. Professor and PhD)

Signature _____ Date ____/____/____

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Name of Student: Mulugeta Yaze (BSc.)

Signature  Date 13 / 12 / 2014 E.C

This work has been submitted with my approval as an advisors and examiner:

Name of advisor: 1. Dr. Alemtsehay Mekonnen (Associated professor and PhD)

Signature  Date 13 / 12 / 2014 E.C


Name of advisor: 2. Mr. Endalkachew Worku (Ass. Professor and PhD Candidate)

Signature  Date 13 / 12 / 2014 E.C

Name of examiner: Mr. Melash Belachew (Ass. Professor and Mph in Rh)

Signature  Date 13 / 12 / 2014 E.C

Name of department head: Dr. Eleni Admasu (Ass. Professor and PhD)

Signature  Date 13 / 12 / 2014 E.C