Addis Ababa University

College of Natural and Computational Sciences

Department of Zoological Sciences

.

Prevalence of HIV/AIDS infections and associated risk factor among individuals attending Bichena and Yetmen Health centers in Enemay woreda, Amhara Regional state, Ethiopia

By: Endaweke Mekonnen

Advisor:Tegenu Gelana (PhD)

A Thesis submitted to the Department of Zoological Sciences of Addis Ababa University in Partial Fulfillment of the Requirements for the Degree of Master Science in General Biology

August, 2024

Addis Ababa
Ethiopia

APPROVAL SHEET

Title: Prevalence of HIV/AIDS infections and associated risk factor among individuals attending Bichena and Yetmen Health centers in Enemay woreda, Amhara Regional state, Ethiopia

Approved by

1.Advisor Dr.Tegenu Gelana Signature …….. Date

2.Examiner Dr.Dagim J Signature…….. Date

3.Department head Dr Bezawerke Afework Signature…… Date

DECLARATION

This is to certify that the thesis prepared by **Department Of Zoological Sciences study of** Prevalence of HIV/AID infections and risk factor among individuals attending in Bichena and Yetmen health centers in Enemay Woreda,Eas Gojjam Zone,Amhara,Ethiopia.And A Thesis submitted to the Department of Zoological Sciences of Addis Ababa University in Partial Fulfillment of the Requirements for the Degree of Master Science in General Biology complies with the regulation of the University and meets the accepted standards with respect to originality and quality.

Approved by Examining Board

1. Dr Tegenu Gelana_____ _____ _____

Name of Advisor signature Date

2. Dr Dagim J_____ _____ _____

Name of internal examiner signature Date

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

Name of advisor:Tegenu Gelana (PhD)

Signature……

Date……

Name of candidate EndawekeMekonnen Signatur……..

Date of submission ……

ACKNOWLEDGMENTS

My deepest gratitude goes to my advisor, Dr.Tegenu Gelana for spending his precious time to give genuine and regular advice, to provide support and encouragement and to correct this thesis from the beginning up to the very end. I would like to praise the laboratory technicians of Bichena and Yetmen Health Centers, who helped me in collecting and observing the blood specimens through HIV rapid diagnostic test. I am also thankful to health professionals and administrative of Bichena, Yetmen Health Centers and the NGOs project of Organization of Social Service Association and Health Development (OSSAHD) in Enemay woreda who provided me necessary information about the current situation of HIV in the towns. It is also important to mention that this work would not have been possible without the Willingness of all the respondents who participated in all the surveys, on which these papers are based.

Above all, I want to thank the Almighty God who strengthened me throughout my duties.

Table of Content

List of tables

List of figures

Acronyms/Abbreviations

AIDS	Acquired Immune Deficiency Syndrome
ART	Antiretroviral treatment
BOFED	Bureau of Finance and Economic Development
CVM	Community Voluntary Mission
EFEDO	Enemay Finance and Economy Development Office
EDHS	Ethiopia Demographic and Health Survey
FMOH	Federal Minister of Health
HAPCO	HIV/AIDS Prevention and Control Office
HIV	Human Immune deficiency Virus
MOH	Minster of Health
PMTCT	Prevention of mother to child transmission
SSA	sub- Sahara Africa
STDS	Sexually transmitted diseases
STIS	Sexually transmitted infections
UNAIDS	Join United Nations Program on HIV/AIDS
UNICEF	United Nations International Children's Emergency Fund
VCT	Voluntary Counseling and Testing
WHO	World Health Organization

ABSTRACT

The HIV/AIDS epidemic is one of the leading causes of death and illness in Ethiopia. According to the report of CVM (2016), the prevalence of HIV in Ethiopia and Amhara regions is about 1.18% and 1.5%, respectively. The aim of this study was to assess the prevalence of HIV/AIDS and its risk factors in Bichena and Yetmen town's health centers in Enemay Woreda. A health center-based cross-sectional study was conducted in 403 study participants from February to June 2023. Questionnaires were administered to collect data socio-demographic variables and to determine the knowledge, attitude and practice of the study subjects in regarding to HIV prevention and transmission. The blood specimens were taken from study participants and tested for the presence of antibody to HIV infection using the national HIV rapid diagnostic tests algorithm. About 10 of the administrative bodies and health professionals of Bichena and Yetmen Health Centers were interviewed about to get current situation of prevalence of HIV/AIDS, VCT service and its risky factors within the study area. Binary logistic regression analysis was computed to identify the independent risk factors. The overall prevalence of HIV in the study participants was 23 (5.7%) in which nine of them are males and fourteen of them are females. Among these, most of the HIV positive study subjects were job seekers, tea house workers, commercial sex workers and daily labors. There are risk factors that can contribute for HIV infection and among these about 60.8% (n=245) and 59.6% (n=117) of the study participants practiced unsafe sex and didn't use condom during sexual intercourse respectively. In addition, about 50.2% (n=202) of the study participants didn't have constant sexual partner and 66.3% (n=267) of them didn't have an interest in using condom during sex. About 58.3 % (n=235) of them used addictive drugs such as khat, alcohol and others. Hence the prevalence of HIV infection among the study participants in the study area was high and this suggested that the disease is not under the control yet in the country.

Keywords/phrases: HIV/AIDS, Risk of HIV, HIV infection, Prevalence of HIV

1. INTRODUCTION

1.1 Background of the study

AIDS is the disease which is caused by the virus called human immunodeficiency virus (HIV). It affects the immune system of the body of human beings. The epidemic was firstly recognized in the year 1980. Since then about 20 million people died and 38 million people are estimated living with HIV in the world (Barré-Sinoussi *et al*., 2023). The rate of infection of the epidemic is still increasing in many countries of the world and it is distributed unevenly. It is a major development concern in many countries and is destroying the lives and livelihoods of many people around the world.

The HIV/AIDS epidemic is one of the largest obstacles to development in many countries and is destroying the lives and livelihoods of millions of people around the world. It is estimated that approximately 15,000 people are infected with HIV every day (Collins and Bill, 2000). The situation is worst in regions and countries where poverty is extensive, gender inequality is pervasive, and public services are weak. Almost 95 percent of the people infected with HIV live in developing countries and the situation is especially critical in sub-Saharan Africa where around 68 percent of all adults and 90 percent of all children infected with HIV.

Since HIV/AIDS was acknowledged as a human being problem, the health researchers have been conducting different research in order to tackle or control the epidemic by developing medicine or vaccine. However, due to the very unique nature of the virus they could not succeed in developing a medicine or vaccine that totally cures or protects from the disease. The antiretroviral medicines which are available currently, at best can diminish the infection rate (WHO, 2012).

Various ways have been pointed out regarding how the epidemic has transmitted from one individual to another. However, there are common modes of transmission of HIV; the main mode of transmission is also different in different regions of the world. For example, in developed countries homosexual sex and intravenous drug injection are usually considered to be the means of transmission of HIV/AIDS, on the other hand, in developing countries heterosexual contact is the main mode of transmission (Nanyombi, 2019).

Almost all countries worldwide are affected by the HIV epidemic. No region of the world has been spared. Although the epidemic is global, there is a remarkable regional variation in its distribution. Some regions are highly affected by the epidemic as compared to other regions. Sub-Saharan Africa

(SSA) is one of the hot spots where HIV/ AIDS is widely spread and it is more hard hit by the consequences of epidemic than other parts of the world. It is the region where the highest number of victims of HIV/AIDS is found. Among all the people who are infected by diseases all over the world, about 68% (22.5 million) are living in this region (UNAIDS 2002)

According to the United Nation classification of 'generalized epidemic' about 90% of the countries which are located in SSA are severely affected by the epidemic. This epidemic has remained the major cause of death in this region. Although the region accounts only for 10% of the world population, it comprises almost 25.8 million of the victims of HIV/AIDS in the world (Nematahe, 2023). In 2005 an estimated 3.2 million people in the region became newly infected, while 2.4 million died of AIDS. Among the younger generation (15-24 years) the percentage of HIV infected women and men account for 4.6% and 1.7%, respectively (UNAIDS, 2004). There were 2.7 million new HIV infections in 2010. HIV/AIDS accounts for about approximately 90% of all infection (Setty, and Hewlett, 2014)

Ethiopia is one of the sub-Saharan Africa countries which are hard hit by the HIV pandemic and a large number of infected people have been living with HIV. Ethiopia accounts for a big share in the number of cases at worldwide as well as at the regional levels. Worldwide, Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS) poses an enormous challenge on the survival of mankind (Idemyor and Vincent, 2006).

The HIV pandemic remains the most serious of infectious disease challenges to public health. Promising developments have been seen in recent years in global efforts to address the AIDS epidemic, including increased access to effective treatment and prevention programs. Human Immunodeficiency virus, commonly known as HIV infects the cells of human immune System and destroys them which later develop into an advanced condition called Acquired Immunodeficiency Syndrome (AIDS).This condition declines the capacity of human body to fight against the diseases making person vulnerable to all kind of infections which may eventually lead to death. HIV is transmitted from one person to other through unprotected anal or vaginal sex, transfusion of contaminated blood and blood products, transplantation of contaminated body organs, sharing of contaminated needles. HIV can also be transmitted from mother to her infant during pregnancy, childbirth and breast feeding (Fernández-Luis *et al*., 2022).

The World Health Organization (WHO) has identified 'heterosexual transmission' as the most common route of HIV transmission throughout the world. The major risky behaviors for heterosexual transmission of HIV are (WHO, 2007):

a) Not using condoms during sex with person having HIV
b) Having sex with multiple partners

HIV Counseling and Testing has been identified as the key entry point to prevention, care, treatment and support services, where people learn whether they are infected, and are helped to understand the implications of their HIV status and make informed choices for the future. Currently, most people remain unaware of their HIV status due to various reasons. However, with the development of affordable and effective medical care for people living with HIV, the demand for testing has rapidly increased, creating an urgent need to improve access and quality of the service (Gatta,2011)

1.2. Statement of the problem

The HIV/AIDS pandemic is the worst health crisis in history. It is clearly moved beyond being HIV primarily a health and psychosocial issue to economic and developmental crisis. The overall adult prevalence in this region is 5.9 percent. There were about 2.1 million deaths due to HIV/AIDS in 2006 (Albright and Kendra, 2007) High prevalence countries are experiencing dramatic drops in life expectancy; the ill and the dying are overwhelming. The already strained public health services and millions of children being orphaned often without adequate social safety nets, HIV/AIDS deepens household poverty, threatens development, social cohesion, political stability, food security and life expectancy and imposes devastating economic burden.

Ethiopia is one of the sub-Saharan countries highly affected by the HIV/AIDS pandemic. The adult prevalence of HIV infection in Ethiopia was estimated at 2.4% in which most of the burden occurring among the young age groups (Leshargie,*et al* 2022).. Recent studies indicate that overall coverage of voluntary counseling and testing (VCT) are extremely poor in countries with very high HIV/AIDS burden. Only 5% of the people with HIV/AIDS are estimated to be aware of their status worldwide (WHO, 2006). Sexually transmitted diseases (STD) are increasing among adults less than 25 years of age (Nadarzynski *et al*., 2021)

Ethiopia has the 16th highest HIV/AIDS prevalence rate and the third largest population living with HIV/AIDS. A lack of information continues to be a primary stumbling which together with several other factors to counter the spread and impact of the disease. The factors include stigma, discrimination,

silence about the diseases, poverty, inequality, gender inequality, war, conflict and STDs (Mohammed, *et al*.,2015) The social cost of HIV/AIDS to individual people, to families, and to the whole country of Ethiopia cannot be under estimated. AIDS is the leading cause of death in 15 - 49 age groups. This has enormous implications for the encouraging of the region because so many of the working population are affected by the disease almost 72,000 people in Ethiopia died of AIDS in 2007(Mohammed *el al.,2015*). The devastating effect of HIV/AIDS in Ethiopia has become more visible over time and life expectancy is estimated to have fallen from 50 years to 42 years. Today 42% of the hospital bed in the country is estimated to be AIDS patient, draining the scarce resource allocated to the health sector (Srivasta *et al*., 2022*).*

According to the CVM report (2016) the prevalence of HIV in Ethiopia is about 1.18% and in Amhara is about 1.5%. Likewise Bichena and Yetmen are the hot spots areas of HIV infections in Amhara region. Therefore, the aim of this study was to assess the prevalence of HIV/AIDS and its risk factors in the Bichena and Yetmen health centers in Enemay woreda in East Gojjam zone,Amahara Regional State.

1.3. Objectives of the study

1.3.1. General objective

The overall objectives of this study was to assess the prevalence of HIV infection and associated risk factors in Bichena and Yetmen health centers East Gojjam Zone, Ethiopia.

1.3.2. Specific objectives

- To assess the prevalence of HIV/AIDS in Bichena and Yetmen Health Centers.
- To assess the awareness of study participants in prevention, transmission and treatment of HIV/AIDS.
- To determine the risk factors of HIV/AIDS in in Bichena and Yetmen health centers.
- To evaluate the magnitude of VCT service in Bichena and Yetmen Health Centers.

1.4. Significant of the study

The study was conducted to assess the prevalence of HIV/AIDS and its risk factors in Enemay Woreda. The findings of this study will have a significance use in identifying the risk factors for the prevalence of HIV infection in the study area. Besides to this, it also helps to know the current situation of HIV/AIDS in the towns and gives feedback in reducing the mortality of people due to HIV/AIDS in the towns. This finding can also be used as the base line data for further studies.

1.5. Scope of the study

The study was concerned to the prevalence of HIV/AIDS and the associated risk factors in Enemy Woreda, East Gojjam Zone, Ethiopia. The total number of population in the study area is 91177 among these 31,740 are males and 37,678 are females in a Bichena and 9779 are males and 12,000 are Females in Yetmen towns (EFEDO,2022) Hence the study was limited to Bichena and Yetmen towns' health centers and it was carried out from February to June, 2023.

2. RELATED LITERATURE REVIEW

2.1. Global Overview of HIV/AIDS

Globally, the HIV/AIDS pandemic remains a major public health, social, economic and development challenges. According to the latest UNAIDS data covering 160 countries, the number of people living with HIV on antiretroviral therapy has increased by about a third, reaching 17 million people-2 million more than the 15 million by the 2015 target set by the United Nations General Assembly in 2011. In the world's most affected region, eastern and southern Africa, the number of people on treatment has more than doubled since 2010, reaching nearly 10.3 million people. AIDS related deaths in the region have decreased by 36% since 2010. However, huge challenges lie ahead (WHO, 2015). In 2015 there were 2.1 million (1.8-2.4 million) new HIV infections worldwide, adding up to a total of 36.7 million (34-39.8 million) people living with HIV(UNAIDS, 2016).

Every day, over 6800 persons become infected with HIV and over 5700 persons die from AIDS, mostly because of inadequate access to HIV prevention and treatment services. Sub-Saharan Africa remains the most seriously affected region, with AIDS remaining the leading cause of death there. It is estimated that 1.7 million people were newly infected with HIV in 2007, bringing to 22.5 million the total number of people living with the virus (Kerani *et al.,* 2020) unlike other regions, the majority of people living with HIV in sub-Saharan Africa (61%) are women. Complex and varied social, structural and economic dynamics within countries account for uneven geographical distribution of HIV. In many countries, HIV prevalence is higher in cities, where the vibrancy, stress and anonymity of urban life, and its bustle of encounters and interactions, provide increased opportunities for behaviors and sexual networking that may increase the risk of HIV infection (UNAIDS. 2016).

Hence HIV continuous to be a major global public health issue, in 2016,an estimated 36.7 million people were living with HIV(including 1.8 million children) with a global HIV prevalence of 0.8% among adults (UNAIDS,2017) The vast majority of people living with HIV are located in low and middle income countries, with an estimated25.5 million living in sub-Sahara Africa. Among these group 19.4 million are living in east and southern Africa which saw 44% of new HIV infections globally in 2016 (UNAIDS, 2017 AIDS is a condition in the human that that is associated with failing of immune system failure leading to life threatening opportunistic infections. Infections with these HIV

viruses occur through blood, vaginal fluid, semen, pre-ejaculate or breast milk. The main routes of transmission are unsafe sex, contaminated needles, breast milk as well as mother to child transmission at birth called prenatal transmission (Jeremy *et al*., 2010).

2.2. HIV/AIDS in sub-Sahara Africa

HIV infection is widely distributed in sub-Sahara Africa. In 2013 an estimated 35 million people were living with HIV worldwide. Sub-Sahara Africa is home to only 12% of the global population, yet accounts for 71% of the global burden of HIV infection (Waweru and Korir, 2019)..Ten countries, mostly in southern and eastern Africa, south Africa(25%), Nigeria(13%), Mozambique(6%), Uganda(6%),Malawi(4%) and Ethiopia(3%) account for almost 80% of all people living with HIV (UNAIDS, 2014). With more than thirty years of HIV epidemic, there is still no cure or an effective vaccine; however, there have been major advances in treating HIV (Kharsany and Karim, 2016).

As the availability and rapid scale up of an ART has transformed what was inevitable a fatal disease to a chronic, manageable condition leading to noticeable declines in the worldwide rates of AIDS related death and new infections. In sub-Sahara Africa, the main mode of HIV transmission is through heterosexual sex with a concomitant epidemic in children through vertical transmission. Women are disproportionately affected accounting for 58% of the total number of people living with, have the highest number of children living with HIV and the highest number of AIDS related death (Idele *et al*.,2014). With increasing access to ART, the number of AIDS related deaths have steadily declined and in sub-Sahara Africa these decreased by 39% between 2005 and 2013 (UNAIDS, 2014).

2.3. HIV/ AIDS Epidemic in Ethiopia

Ethiopia has a large and very vulnerable population, with an estimated 15% of the population living below the poverty line HIV/AIDS is one of the key challenges for the overall development of Ethiopia, as it has led to a seven year decrease in life expectancy and a greatly reduced workforce (Regassa,2022).The HIV epidemic in Ethiopia is generally considered to be high, with increasing levels of economic hardship, expanding urbanization, increased mobility due to labor migration, a history of conflicts and civil disruption, and better educational and trading opportunities facilitating the spread (UNAIDS, 2012). Since the first two reported AIDS cases in 1986, the deaths have spread at an alarming rate throughout the country (FMOH/HAPCO, 2007).In fact, any attempt to analyze the epidemiology of HIV in Ethiopia is limited by the lack of sufficient longitudinal, cross-sectional and behavioral data. The country's HIV epidemic varies according to region, so HIV and AIDS

programmers should not only be based on national-level statistics but should be more geographically focused, directed to those regions, districts or communities exhibiting high prevalence rates (UNAIDS, 2012).

Conducting research and disaggregating data to the district level in order to identify population groups at higher risk are mandatory to expand services such as VCT, treatment of sexually transmitted infections, antenatal and postnatal prevention of mother to child transmission (PMTCT), TB/HIV integration, and services targeted to specific populations, including youth, students, sex workers, migrants, refugees and other displaced populations, and the uniformed services (UNAIDS, 2012). In 2007, the national adult HIV prevalence was estimated to be 2.1%, of which 7.7% was from urban areas and 0.9% from rural areas (Gatta *et al*.,2012) Similarly in 2010, adult HIV prevalence in Ethiopia was 2.1% (United Nations, 2010). Even though various efforts at preventing the spread of HIV have been carried out in the country, HIV infection is still on the increase in Sub-Saharan Africa, and AIDS is now recognized as the leading cause of adult morbidity and mortality in Ethiopia. Unprotected sex and the high frequency of causal partners are the cause for the fast progression of the epidemic (FMOH and HAPCO, 2012).

People who are HIV positive use antiretroviral treatment (ART) and this reduces the diseases related to HIV and even death so the impact of HIV is not well known. In 2016 the estimated number of people living with HIV is 718,500 from this 653,412(91%) are adults and 65,088(9%) are children and 437,763(60%) are female and 284,737(40%) are male (RETA, 2017) HIV prevalence varies in different regions of Ethiopia (CVM, 2016).

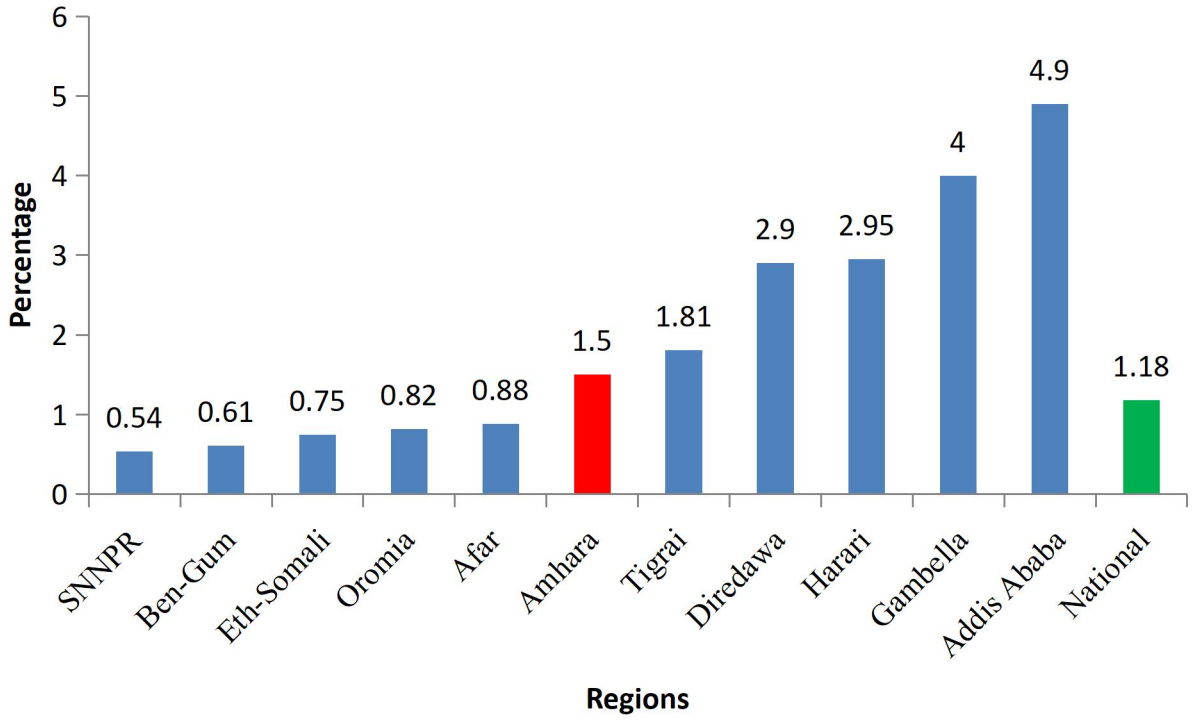


Figure 1**: Prevalence of HIV/AIDS in different region of Ethiopia (Source: CVM report, 2016).**

In the year 2016, the estimated number of new infections is about 27,288 and from this 21,731(80%) are adults and 5,557(20%) are children hence 41% are male and 59% are female.

People living with HIV need antiretroviral treatment (ART) and the total annual death rate are about 19,743 from these 16% is among age 0-14 years and 58% are female.

2.4. HIV/AIDS situation in Amhara

According to the report of CVM in 2016, HIV prevalence in Amhara region is about 1.5% and the total estimated number of people living with HIV is about 204,481. From this 186,117(91%) are adults and 18,364(9%) are children and 124,920(61.10%) are female and 79,562(38.9%) are male. In the year 2016, the estimated numbers of new HIV infections in Amhara region are about 7,328 and from this 5,892(80.4%) are adults and 1,436(19.6%) are children that is 2,928(40%) are male and 4,399(60%) are female (CVM, 2016). In the year 2016, the estimated number of annual AIDS death in Amhara is about 4,431 and from this 3,587(81%) are adults and 844(19%) are children. From this 1,804 (40.7%) are male and 2,627(59.3%) are female. In general the main risk factors for the prevalence of HIV/AIDS are face book, sex film; addictive drugs such as khat, alcohol, and sexual intercourse before marriage,

having more than one sexual partner, sex with commercial sex workers, and improper use of condom are some of the factors (CVM, 2016).

2.5. Burden of HIV/AIDS in Adolescents

Adolescence includes young people aged 10-19 years. The adolescents comprise about 1.2 billion people of the total world population. Adolescence is the period when many people begin to explore their sexuality most young people at this age become sexually active. Adolescents are also exposed to significant deaths, illness and diseases. Unprotected sex may jeopardize not only their current health but also their health for years to come. Global reports on adolescent reveal that 2 million adolescents are living with HIV (WHO, 2014). HIV/AIDS is the second highest cause of adolescent deaths globally an estimated 1.3 million adolescent died in 2012 (Moghaddam *et al.,* 2016)

Emerging evidence suggest that young people living with HIV especially adolescents are less likely than others to receive health care that can keep them healthy and alive (UNAIDS,2012; UNAIDS, 2014; WHO, 2014). Decline recorded in HIV prevalence in young people in 21 of 24 countries with natural HIV prevalence of 1% or higher, has been attributed to effects of behavioral changes, such as waiting longer to become sexually active, having fewer multiple partners and an increase use of condoms amongst people with multiple sexual partners (Idele *et al*., 2014).

To prevent the spread of new infection, adolescents and young people need accurate and relevant information. This may also be accompanied by access to voluntary counseling and testing, HIV education in schools and the prevention of other STIs. Adolescents are vulnerable to early age initiation of sexual activities, STIs, substance /drug abuse, alcohol and the like which facilitate the risk of acquiring HIV/AIDS (Neema *et al*., 2004). Young people need to know how to protect themselves and have the means to do so. this includes being able to obtain condoms to prevent sexual transmission of the virus and clean needles and syringes for those who inject drugs , better access to HIV testing and counseling is also required (WHO, 2014).

2.6. The Risky Factors that Lead to HIV/AIDS

Poverty enhance the vulnerability of contracting HIV through different channels, including increased movement of people from one place to another (urban to rural) or (rural to urban), limited media exposure, limited access to health education, sexual exploitation and gender inequality. Poverty exposes people to food insecurity and fails to fulfill other basic needs. This problem facilitates sexual

risk behaviors by forcing them to engage in commercial sex practices. Women's economic dependence on their partner may also expose them to their partner insisting on unsafe sex. Poverty is also related to the biological problems of human beings through food insecurity and malnourishment. Malnutrition will expose individuals to the disease through weakening of their immune system (Beegl and Walque, 2009).

Education is one of the most focused socio-economic factors which are put forward in relation to the prevalence of the AIDS epidemic. The benefit of education in relation to diminishing the prevalence of the epidemic can be classified in short and long terms. In the short run, education will benefit individuals through raising awareness, accessing and perceiving different information through reading and experience how to protect themselves from the epidemic. Hence, more educated individuals have a tendency of preventing the diseases by applying safety methods in the short run. In the long run, education may benefit individuals by eradicating poverty and other related risk factors through discovering a new knowledge and increasing the level of income of individuals which in turn diminishes the prevalence rate of the epidemic. In the other hand individuals who are less educated experience a higher rate of HIV infection due to their low income, decreased autonomy and limited access to information concerning the way the disease is transmitted and its prevention method (Beegl and Walque, 2009).

Most migrant workers are forced to stay in their work places for extended periods separated from their families and marriage partners; there will be a tendency of having new sexual partners during their migration period. Hence, they will have a wider range of sexual networking than non-migrant workers. Thus, this will in turn accelerate the transmission of the HIV/AIDS epidemic. In purely heterosexual sex, HIV prevalence level is higher among women than men. This is because of women are biologically more susceptible to infection due to larger genital tract surface area, which may be also torn during sexual activity, which leads to higher risk of HIV transmission. Commercial sex workers are particularly at a risk of infection. The first reason for this is the high number of sexual partners that they have (Rees *et al.*, 2000).

HIV gets passed from person to person in blood, semen, pre-seminal fluid, fluid from the vagina and rectum, and breast milk. Unsafe sex is the most common ways of getting HIV is by having vaginal or anal sex with someone who has HIV. HIV can pass during oral sex, too, but that is less common.

Sharing of sharpening materials such as contaminated needles, syringes, razors and others could cause HIV infection. Alcohol consumption has been identified as an important determinant of HIV infection. This occurs because much sex work is done in alcohol consumption and likely to result in inconsistent condom usage and other unsafe sex behaviors and in addition people who use intravenous and recreational drugs expose them to droplets of other people's blood (William *et al*., 2000).

Sexually transmitted diseases such as herpes, Chlamydia, syphilis, or gonorrhea may cause change in the tissue of the vagina or penis that make easier for HIV to pass while having sex. Improper usage of condom during sex, a mother infected with HIV (before or during birth or by breast feeding) can transmit HIV. It is possible that there is transmission of HIV if HIV infected blood is donated to a health individual and studies indicate that lack of circumcision increases the risk of heterosexual transmission of HIV (Cohen *et al.,* 2019)

2.7. Overview of Voluntary Counseling and Testing

Voluntary counseling and testing (VCT) of HIV is the process whereby an individual or couple undergoes counseling to enable him/her/them to make an informed choice about being tested for HIV status. VCT is an important entry point to other HIV/AIDS services, including prevention of mother to child transmission (PMTCT), prevention and management of HIV related illnesses, and social support. Making VCT more accessible to enable people to know their status can help break the cycle of silence and the myths and misconceptions that fuel the epidemic and may assist in the normalization of having an HIV test (IPPF and UNFPA, 2004).

Pretest, post-test and ongoing counseling are part of the services provided at all VCT sites. Services are voluntary, and are used by clients who have already decided that they want to take HIV test. Confidentiality is an essential component of all the services, at the same time, openness towards partners and families about the status are promoted. Services are anonymous and results are never given over the telephone or disclosed to another person. Clients are identified only by numbers even if they are registered under their name (UNAIDS, 2002).

VCT offers benefits to those who test positive or negative. VCT alleviates anxiety, increases Clients' perception of their vulnerability to HIV, promotes behavior change, and facilitates early referral for care and support including access to antiretroviral therapy (ART) (FHI, 2002). VCT provides people

with an opportunity to learn and accept their HIV status. Pregnant women who are aware of their sero-positive status can prevent transmission to their infants. Knowledge of HIV serostatus can also help people to make decisions to protect themselves and their sexual partners from infection. Studies have indicated that VCT may be a relatively cost- effective intervention in preventing HIV transmission in developing countries including low prevalence settings (WHO, 2001).

Ethiopia responded to the HIV/AIDS epidemic as early as 1985. The Federal Ministry of Health (FMOH) and the HIV/AIDS Prevention and Control Office (HAPCO) developed an HIV/AIDS Policy, different guidelines and strategic documents to create an environment conducive for the implementation of HIV prevention, care, treatment and support programs. As part of this effort, the first counseling and testing guidelines were published by the FMOH in 1996, the second edition in 2002 and the last, currently in use, in 2007(FMOH, 2007).

Based on the strategic framework for the national response to HIV/AIDS in Ethiopia, the number of VCT centers and the number of counselor's has increased enormously as a result of efforts made to build the capacity of the institutions. The number of VCT centers recognized by the FMOH has reached 658 in 2005 and has continued to increase. During 2004/05, 41,387 clients got VCT services, while in 2005 the number of clients who received VCT 33 services rose to 367,006. About 200 laboratory technicians and counselors were trained by HAPCO in 2002/03, while 384 counselors were trained in 2003/04, and 75 Laboratory Technicians and 130 Counselors were trained in 2005(HAPCO, 2006). According to the 2011 Ethiopia Demographic and Health Survey, 66% of women and 82% of men know where to get an HIV test Coverage of HIV testing increased dramatically in between 2005 and 2011. In 2005, only 4% of women and 5% of men had ever been tested for HIV and received the results. In 2011, this figure had a risen to 36% of women and 38% of men (EDHS, 2011).

2.8. Diagnosis technique of HIV/AIDS

Diagnosis of HIV is necessary to protect blood supplies, to identify HIV-positive pregnant women for prevention of mother-to-child transmission (PMTCT), to monitor disease trends in populations, and for clinical diagnostic purposes. The body fluids which are used for HIV rapid testing could be serum, plasma, whole blood, oral fluids or urines. The availability of rapid HIV-antibody tests has made field diagnosis of HIV inexpensive and technically feasible in low-resource areas. Increased access to HIV testing and counseling is essential in working towards universal access to HIV prevention, treatment,

care and support as endorsed by G8 leaders in 2005 and the UN General Assembly in 2006 (David and Nigel, 2007).

Tests used for the diagnosis of HIV infection in a particular person require a high degree of both sensitivity and specificity. The enzyme-linked immune sorbent assay (ELISA), or enzyme immunoassay (EIA), was the first screening test commonly employed for HIV. In an ELISA test, a person's serum is diluted 400-fold and applied to a plate to which HIV antigens have been attached. If antibodies to HIV are present in the serum, they may bind to these HIV antigens. The plate is then washed to remove all other components of the serum. A specially prepared "secondary antibody" an antibody that binds to human antibodies is then applied to the plate, followed by another wash. This secondary antibody is chemically linked in advance to an enzyme. Thus the plate will contain enzyme in proportion to the amount of secondary antibody bound to the plate. A substrate for the enzyme is applied, and catalysis by the enzyme leads to a change in color or fluorescence. ELISA results are reported as a number; the most controversial aspect of this test is determining the "cut-off" point between a positive and negative result (UNAIDS/WHO, 2006).

During window period, antibody tests may give false negative (no antibodies were detected despite the presence of HIV), an interval of three weeks to six months between the time of HIV infection and the production of measurable antibodies to HIV sero conversion. Most people develop detectable antibodies approximately 30 days after infection, although some seroconvert later. The vast majority of people (97%) have detectable antibodies by three months after HIV infection; a six-month window is extremely rare with modern antibody testing (UNAIDS/WHO, 2006). During the window period, an infected person can transmit HIV to others although their HIV infection may not be detectable with an antibody test. Antiretroviral therapy during the window period can delay the formation of antibodies and extend the window period beyond 12 months (UNAIDS/WHO, 2006). This was not the case with patients that underwent treatment with post-exposure prophylaxis (PEP). Those patients must take ELISA tests at various intervals after the usual 28-day course of treatment, sometimes extending outside of the conservative window period of 6 months (*Bonato, 2015*)

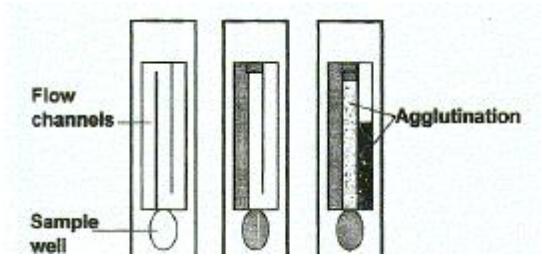
The Performance of medical tests is often described in terms of sensitivity (the percentage of the results that will be positive when HIV is present) and specificity (the percentage of the results that will be negative when HIV is not present). All diagnostic tests have limitations and sometimes their use may

produce questionable results such as false positive (the test incorrectly indicates that HIV is present in a non-infected person) and false negative (the test incorrectly indicates that HIV is absent in an infected person).

In order to reduce the number of incorrect results, it is possible to use individual tests in combination algorithms that perform better than single tests alone. Algorithms may consist of one screening test with a second test to confirm initial positive results, or two in parallel with a third test as a tiebreaker for discordant samples. These strategies are commonly called serial and parallel algorithms respectively. A single algorithm tests all specimens with a single rapid assay while a serial algorithm, which tests all specimens with a single rapid assay and retests the results, found to be positive with a second rapid assay. In the serial algorithm, discordant results are considered indeterminate. A parallel algorithm tests all specimens with two rapid tests and resolves discordant results by retesting with a third, tiebreaker test (UNAIDS/WHO, 2006).

The principles of rapid test is enzyme immunoassay-based with a solid phase/particle coated with synthetic/recombinant HIV I & HIV II antigens. The product should be able to detect antibodies to all of HIV I and HIV II during early sero-conversion period. The product should have positive and negative controls. A reactive rapid HIV test result must be confirmed before a diagnosis of infection can be given. There are different types of rapid HIV test formats (UNAIDS/WHO, 2006). These are:

a. Agglutination tests: they use different types of particles to produce clumping or settling patterns of the particles when a specimen is positive. An autologous red cell agglutination method detects HIV antibodies with a hybrid antigen-antibody reagent which agglutinates the patient's red blood cells. Latex particle agglutination detects HIV antibodies by the agglutination of minute latex particles when mixed with the patient’s blood. A newer method uses fluid capillary action to enhance and quicken particle agglutination. Particle adherence detects HIV antibodies when the settling pattern of small gelatin particles is altered (Examples: Capillus, Serodia).



RESULTS

Reactive Latex Aggregation-white clumping

Non-reactive-No Latex Aggregation, no white clumping

Figure 2: Diagnosis of HIV rapid test

b. Flow through cassettes, or membrane immune concentration devices: they capture and detect HIV antibody in a specimen flowing through a porous membrane. A visible dot or line forms on the membrane when HIV antibodies are present. (Examples: Multi-spot, Genie II). **Solid phase tests** include the dipstick "comb" assay. This assay uses a solid plastic matrix to which an HIV antigen is fixed. When HIV antibodies are present, a spot or dot will be visible when processed with a signal reagent

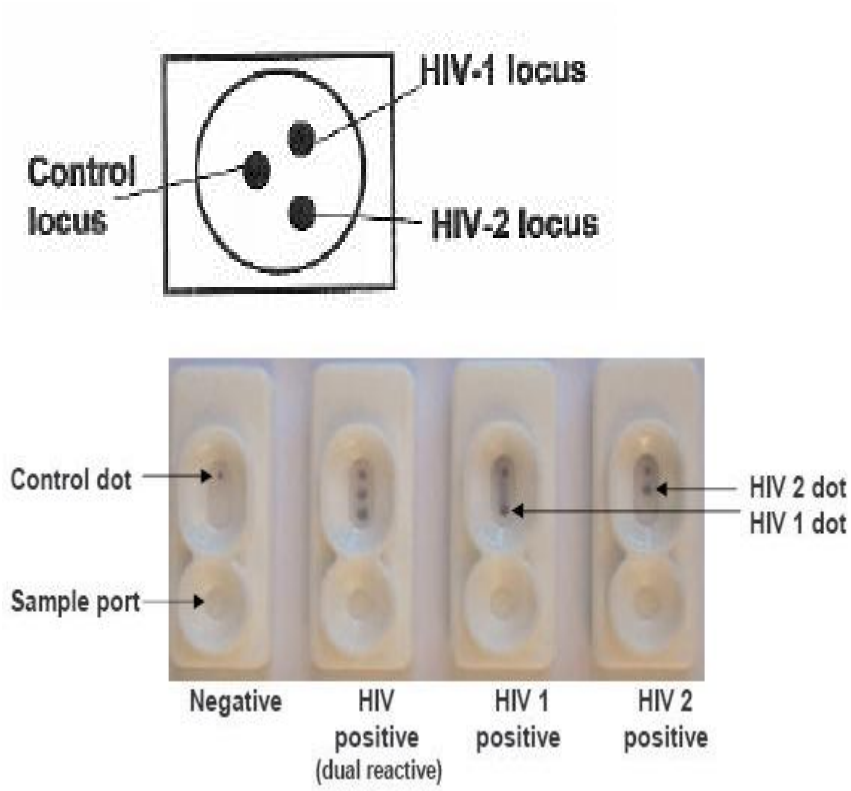


Figure.3.Diagnosis.of.HIV.rapid

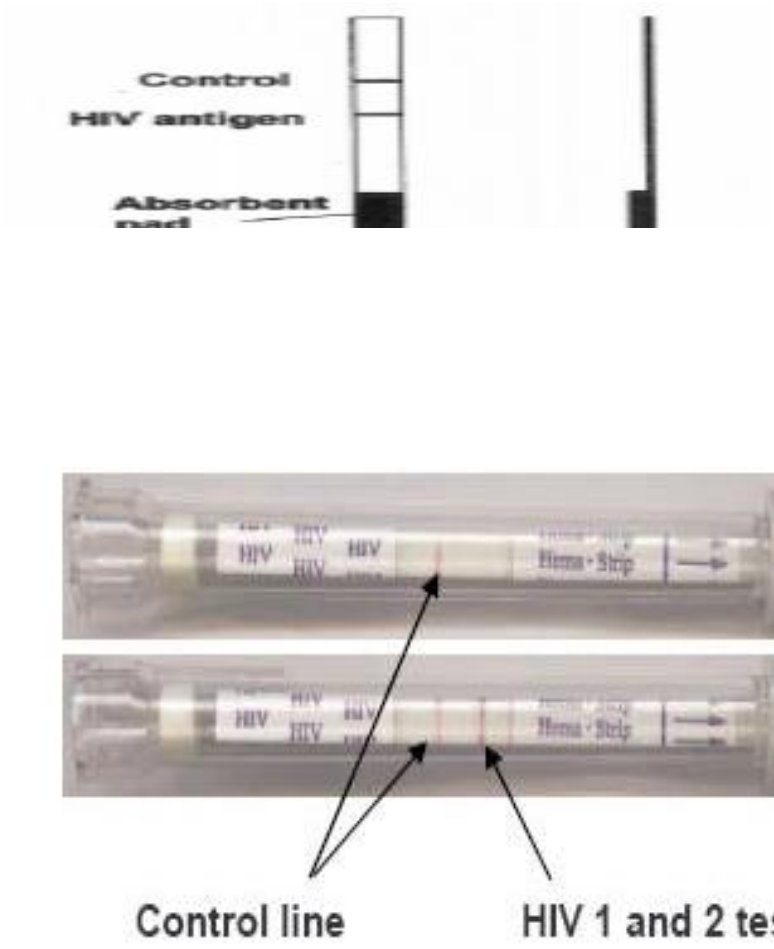
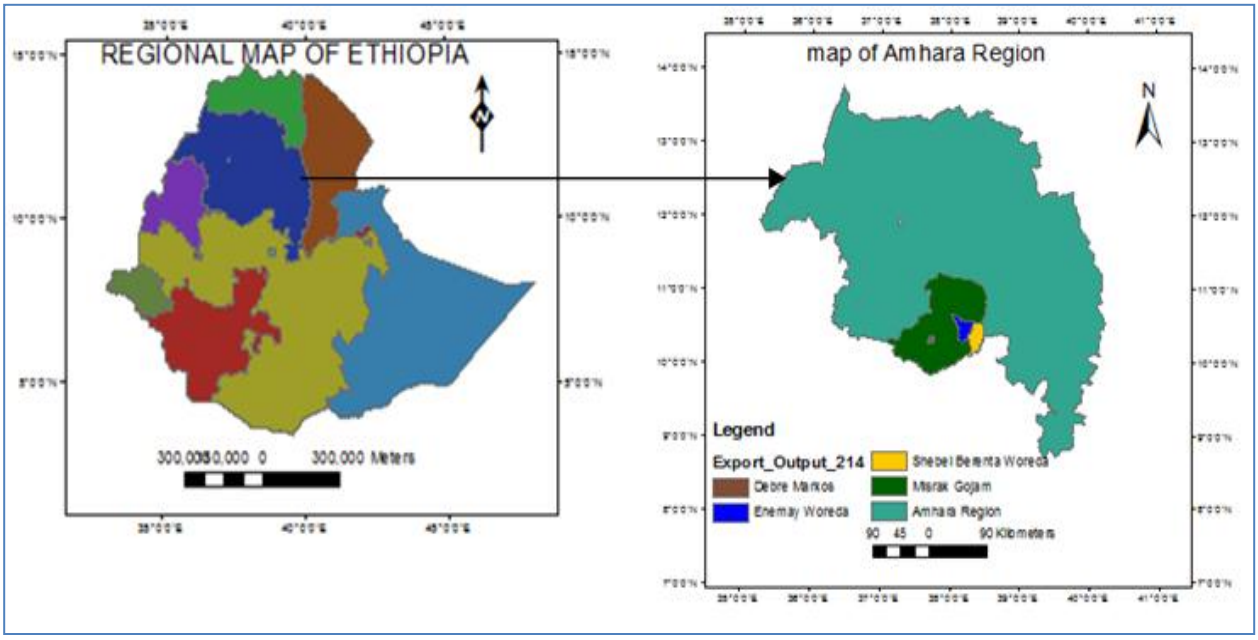


Figure 3: Diagnosis of HIV/AIDS through experimental kits

3. MATERIALS AND METHODS

3.1. Description of the study area

Enemay Woreda is one of the 21 Woredas in East Gojjam Zone, Amhara Region of Ethiopia. Enemay Woreda has one primary hospital, five health centers and eight private medium clinics. The relative location of the woreda is 265 km north of Addis Ababa and 222 km south of BahirDar, which is the capital city of Amahara Regional state. It comprises of 6 urban and 24 rural kebeles.The Woreda is bounded by DebayTilatgen woreda in the west, Enarigenawuga Woreda in the north, Dejen Woreda in south and in the east by Shebel Berenta Woreda. The major town of the Enemay woreda is Bichena town. The woreda has an estimated total population 180,658 of which 89,394 are males and 91,264 are females from these 31,740 are males and 37,678 are females in Bichena, and 9779 are males and 12,000 are females in Yetmen towns (EFEDO,2022).



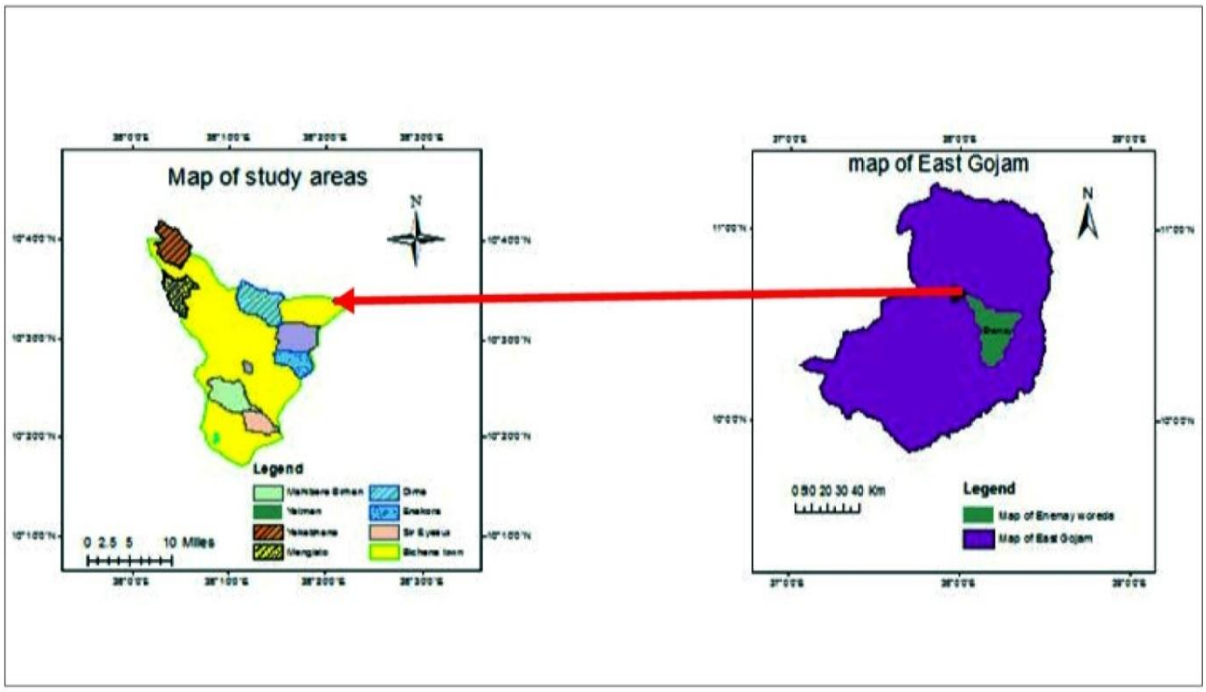


Figure 4: Map of Ethiopia showing Amhara region and Enemay District (Adopted from GIS A.2023)

3.2. Research design

Health centers based cross sectional study was used to assess the prevalence of HIV/AIDS and its risk factors among individual who were attending in Bichena and Yetmen health centers for HIV test from February to June 2023. Blood specimen was collected from fingers of participants using capillary tubes and diagnosis of HIV. Information was gathered from documents (registration book lists) about prevalence of HIV. The concerned bodies (health professionals and health administrative bodies) were interviewed about to know current situation of prevalence of HIV/AIDS, its risky factors and VCT service.

3.3. Study population

The study was focused on Bichena and Yetmen health centers located in Bichena and Yetmen towns, respectively. So individuals who were attending in the two health centers for HIV tests during the study period were the study population and the source population consists of all the people, who visited the two health centers to get an HIV-Test.

.

3.4. Sample size determination and sampling technique

From the population of Enemay woreda (Bichena and Yetmen health centers), sample size was determined by using the formula (Daniel and Cross, 2018)

$$n=Z^2p\ (1-p)/d^2$$

Where; n= Sample size

Z=Statistic for a level of confidence

P=Expected prevalence or proportion

d=Precision/marginal error.

The prevalence of HIV/AIDS is not known in the study area so the expected prevalence (p) was taken as 50%. A minimum sample size of 384 was taken by using 5% marginal error in the following way;

$$n=Z^2p\ (1-p)/d^2$$

$n= (1.96)^2\ (0.5)\ (0.5)/\ (0.05)^2 = 384$

By assuming an additional 5% as compensation for non-response, the total sample size (n) became 403. Similarly the appropriate sample from the two study areas was taken by using proportional allocation in the following way.

$n_k= N_k\ n/N=n(N_k)/N$

Where n_k= the sample size for the study area

N_k= the population size of the study area

n= the total sample size

N= the total population size.

The total number of population in the Bichena town (study area 1) is 69,418 and Yetmen town (study area 2) is 21,779.

$n_k=N_kn/N=n(N_k)/N$

n_k= 403(69,418)/91197= 307 samples were taken from Bichena (study area 1). On the same way 96 samples were taken from Yetmen (study area 2).

3.5. Inclusion and Exclusion Criteria

3.5.1. Inclusion Criteria

Individuals who were 15-45 age attending in Bichena and Yetmen health centers for HIV/AIDS test were included in this study due to the leading cause of death at these age group.

3.5.2. Exclusion Criteria

Individuals who were below the age of 15 and above 45 ages were excluded in this study due to leas leading cause of death at age group.

3.6. Study Variables

3.6.1. Dependent Variable

Prevalence of HIV/AIDS was the dependent variable

3.6.2. Independent Variable

The socio demographic characteristics including sex, age, residence, occupation, religion, marital status, educational status were the independent variables.

3.7. Methods of data collection

3.7.1. Collection of blood sample

Blood specimen was collected from fingers of participants using capillary tubes from February to June 2023. Hence Voluntary Counseling and Testing service (VCT) was take place for the selected samples (403) for the age of 15-45 years by the help of Bichena and Yetmen health centers laboratory technicians .During diagnosis, pre-test and post-test counseling was take place by health professionals. HIV positive individuals were referred to HIV/AIDS coordinating office of the Bichena and Yetmen centers to get HIV counseling, treatment, HIV case and support services.

There are three types of HIV tests namely Wantai, Unigold, and Vikia. During diagnosis, first the individual was tested with Wantai by taking one drop of blood from the client and then one drop or 30 micro liter diluents (a buffer which is more sensitive and less specificity) was added. Finally, the result was known from 10-30 minutes. But when the result was reactive (HIV positive), the second type of test that is Unigold was used. In this type of test two drops of blood was taken from the client and then 2 drops or 60 micro liters of diluents (a buffer which is more sensitive and more specificity than Wanti) was added. Finally the result was known within 10 minutes. An individual's HIV-Status was determined, when the results of both the first and second tests shown similar. But during the first and the second results were not similar (discordant), the third type of test (Vikia) was used. In using Vikia 3 drops or 75 micro liters of blood was taken from the client and then one drop diluents (a buffer which is more sensitive and more specificity than unigold) was added. Finally after 5-30 minutes the result was known hence the HIV status of an individual was determined (Federal Democratic Republic of Ethiopia Pharmaceutical Fund and Supply Agency (PFSA), 2016).

During rapid HIV tests the results of an individual was reactive (HIV positive) when two red lines formed in test and control site of the HIV experimental kit. But when there was a formation of only one red line in the HIV experimental kit, an individual was non reactive (HIV negative). For these procedures pad (containing alcohol for brushing the finger tips before and after the blood was taken),

glove, lancet (for tearing the tip of the finger), capillary tubes (for taking blood from the finger) were the necessary materials.

3.7.2. Questionnaire

403 people were given structured questionnaires to answer, in order to understand the prevalence of HIV/AIDS and its risk factors. Ten participants, involving healthcare workers and, administrative bodies were also subjected to semi-structured interviews for the purpose to gather data on the prevalence, risk factors, VCT-service procedures and other aspects of the current HIV situation in the towns. After developing in English, questionnaires were translated into Amharic.

3.8. Data analysis

In this study, SPSS with Version 25 statistical software was used to evaluate the data gathered from questionnaire surveys and blood examinations. Odd ratio (OR) at 95% confidence interval (CI) was used to calculate the strength of the relationship between infection and risk factors in binary logistic regression, which was used to evaluate the independent effect of the variables. The results considered statistically significant, when the p-value was less than 0.05. The crude odd ratio was calculated using univariate analysis, and the adjusted odd ratio was then computed using multivariate logistic regression. Additionally, descriptive statistics was used to analyze the data.

3.9. Ethical consideration

In order to carry out this study, supported letter from the department of zoological sciences was submitted to Bichena Health Office,Bichena Health Center and Yetmen health centers. Permission letter was obtained from Yetmen health center Ref No: 1342/20/03 and Bichena health center Ref. No: 1537/313 In addition to this the local administrative bodies were informed regarding to the objectives and purpose of the study. The study participants were informed regarding to the objectives and purpose of the study to encourage them in taking VCT service. Verbal consent, brief and clear explanations were done to the participants before taking blood samples and administrating questionnaires. The study subjects were included after they were asked for their permission and volunteer to participate in the study by simple random sampling technique. Considered as health professionals I was keep any information.

4. RESULTS

4.1 Descriptive statistic

4.1.1 Socio-demographic characteristics of the study participants

In this study, a total of 403 study subjects' were involved. Of these 225 were males and 178 were females with age ranging from 15 to 45 years. The educational background of the study participants varied, ranging from illiterate to higher education. About 26.8% .Of the participants were students, constituting them the majority. In this study group 40.9% were between 15-25 years, 31.5% were between 26-35 years and 27.5% were between 36-45 years. In the study participants about 7.2% were divorced/widowed while about 52.6% were single. In the study subject's about 84.6% were Christian while 1.5% were Protestants. According to occupation of study participants about 26.8% 0f them were students and about 1.2 % study participants were merchants.

Table1: Socio-demographic characteristics of the study participants

Variables	Study participants (n=403)	
	N	%
Sex		
Male	225	55.8
Female	178	44.2
Residence		
Bichena (study area-01)	307	76.1
Yetmen (study area-02)	96	23.8
Age		
15-25	165	40.9
26-35	127	31.5
36-45	111	27.5
Occupation		
Governmental employee	96	23.8
Merchant	5	1.2
Daily labor	78	19.4
Driver	8	2.0
Student	108	26.8
Others*	108	26.8
Religion		
Christian	341	84.6
Muslim	56	13.9
Protestant	6	1.5
Marital status		
Married	161	40
Divorced/widowed	30	7.4
Single	212	52.6
Educational level		
Illiterate	36	8.9
Read and write	38	9.4
Elementary	120	29.8
Secondary and preparatory	123	30.5
TVET	8	2.0
Diploma and above	78	19.4

4.1.2 Knowledge of study participants in about to HIV/AIDS transmission and prevention

As it is shown in Table 2, about 97% (n =392) of the study participants had awareness about HIV.In the town about 90.5% (n=365) of the study participants had awareness about the modes of transmission of HIV/AIDS. About 60.8% (n=245) of them responded that HIV can be transmitted through practicing

unsafe sex and about 12.9% (n=52) of the study participants responded that HIV can be transmitted through improper use of condom during sexual intercourse. More than half of respondents were had free discussion with their family 62% (n= 249).

Table 2: Knowledge of study participants about to HIV/AIDS transmission and prevention

Characteristics	Frequency	Percent
Awareness about HIV/AIDS (n=403)	**392**	**97**
Yes		
No	**11**	**3**
Awareness about modes of transmission of HIV/AIDS (n=403)	**365**	**90.5**
Yes		
No	**38**	**9.4**
Way of HIV transmission (n =403)		
unsafe sex	**245**	**60.8**
mother to child	**40**	**9.9**
improper condom use	**52**	**12.9**
no faithfulness with partner	**48**	**11.9**
transfusion of infected blood	**18**	**4.5**
Discussing freely about HIV/AIDS in family members (n=403)	**249**	**61.8**
Yes		
No	**154**	**38.2**

In this study, about 48.1% (n=194) of the study subjects had information about HIV/AIDS from television. More than half of respondents were had free discussion with their family 62% (n= 249) Here the graph shows sources of information about HIV which were responded by study participants

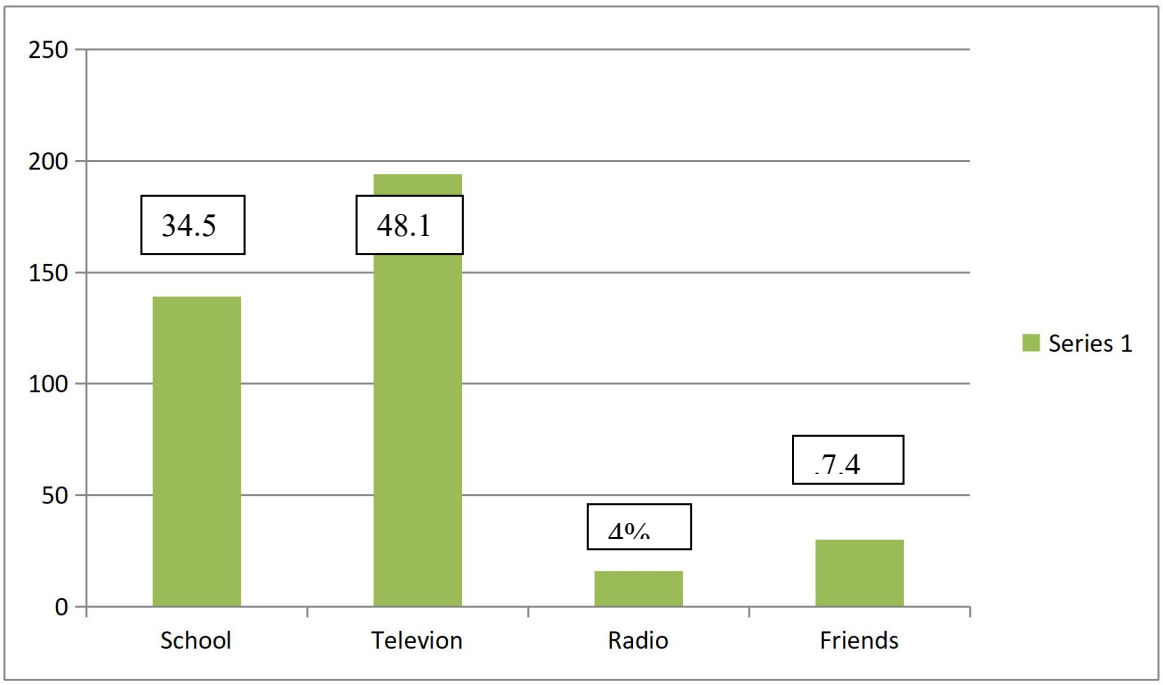


Figure 5: Source of information about HIV/AIDS based on the respondents (n=403)

4.1.3 Attitude of study participants regarding to HIV prevention and transmission

As it is shown in Table 3, about 65.2 % (n=135) of the study participants responded that sexual intercourse is not needed before marriage and while about 24.6% (n=51) of the study participants responded that sexual intercourse is not needed before taking VCT (Voluntary Counseling and Testing Service). About 50.2% (n=202) of them responded that they didn't have constant sexual partner. From the study subjects, about 33.7 % (n=136) of them responded that they had an interest in using condom during sexual intercourse and 66.2% (n=267) of them responded that they didn't have an interest in using condom during sex.

Table 3: Attitude of study participants in regarding to HIV/AIDS

Characteristics	Frequency (%)
Reasons for not having sex before marriage (n= 207)	135 (65.2)
No sex before marriage	
No sex before taking VCT	51 (24.6)
To prevent pregnancy	17 (8.2)
Others	4 (1.9)
Having constant sexual partner (n=403)	201 (49.8)
Yes	
No	202 (50.2)
Having an interest in using condom during sexual intercourse(n=403)	
Yes	136 (33.7)
No	267 (66.3)
Ways of finding condom (n=135)	29 (21.5)
Health institution	
Health institution	
School	14 (26.6)
Keble office	4(2.9)
Restaurant and Hotel	52(38.5)
Others	36(26.6)

About 30.2% (n=122) and 43.9% (n=177) of the study subjects responded that they prevent HIV through abstinence and being faithfulness to their sexual partner respectively. The following figure shows the methods that the study participants used to prevent HIV/AIDS.

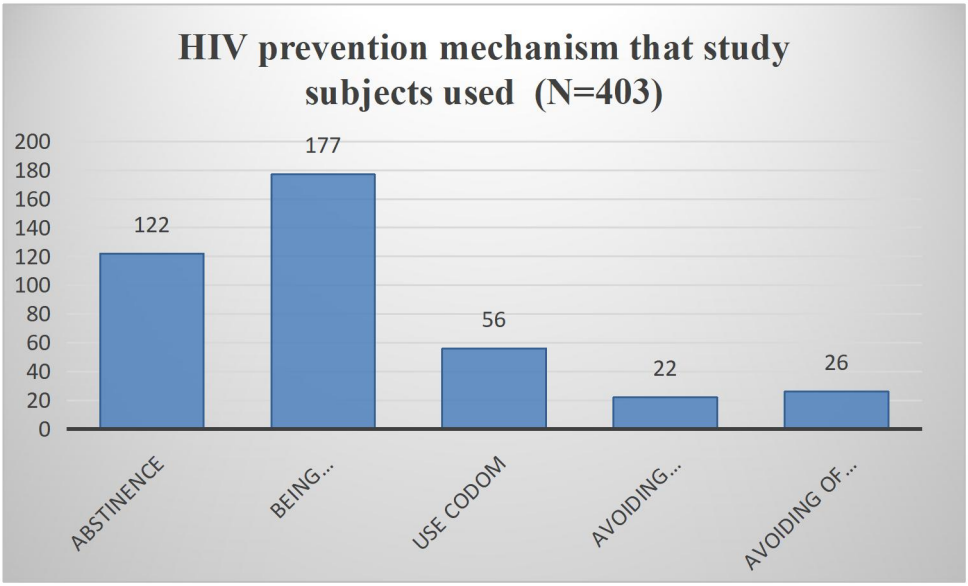


Figure 7: The prevention methods of HIV infection by the respondents (n=403

4.1.4 Practice of study participants in regarding to HIV/AIDS transmission and prevention

As it is shown in Table 4, in this study, about 48.6% (n=196) of the study subjects responded that they had sex before marriage while about 51.% (n=207) of them responded as they didn't have sex before marriage. About 29.5% (n=58) of the study participants responded that they had practiced sex for the first time with commercial sex workers. In this study, about 40.3% (n=79) of the study subjects responded that they used condom during sexual intercourse and about 59.6 % (n=117) of them responded that they didn't use condom during sex at all. According to the response of this study participants, 58.3% (n=235) of them responded that they used addictive drugs such as *Catha edulis* (khat) , tobacco, alcohol and others while about 41.7 % (n=168) of them responded that they didn't use addictive drugs at all.

Table 4: Practice of study participants in regarding to HIV/AIDS

Characteristics	Frequency
	n (%)
Having sex before marriage (n=403)	196 (48.6)
Yes	
No	207 (51.4)
Practicing sex for the first time with (n=196)	58 (29.5)
Commercial sex workers	
Domestic workers	13(6.6)
Student	62 (31.6)
Daily labor	46 (23.5)
Driver	17 (8.6)
Using condom during sexual intercourse (n=196)	79 (40.3)
Yes	
No	117 (59.6)
Have you ever been tested for HIV (n=403)	241 (59.8)
Yes	
No	162 (40.2)
Using drugs such as khat, tobacco, alcohol, or others (n=403)	235 (58.3)
Yes	
No	168 (41.7)
Having your own scissor, razor, needle at home (n=403)	256(63.5)
Yes	
No	147 (36.5)

4.1.5. Prevalence of HIV/ADS with in socio-demographic characteristics

The prevalence of HIV in this study was about 5.7%. According to this study, in Bichena and Yetmen towns about 4% (n=9) and 7.8% (n=14) of the study participants were HIV positive males and females respectively. Among the study subjects, the infection of HIV in age groups 26-35 years were 8.6% (n=11) and it was higher than the others. According to the occupational status of the study participants, about 12% (n=13) the infection of HIV was observed more in commercial sex workers, job seekers, and tea house workers. The infection was more in single (unmarried) individuals of the study participants just about 7.5% (n=16) than those of divorced/widowed and married individuals. In the

study area, the infection of HIV were observed in the study participants who were illiterate about 8.3% (n=3), who were able to write and read only about 7.8% (n=3) and in secondary and preparatory students that was about 1.6% (n=2).

Table 5: Prevalence of HIV/AIDS in the study participants in Bichena and Yetmen towns

Characteristics	Number of examined	Positive n (%)	Negative n (%)
Sex			
Male	225	9(4)	216(96)
Female	178	14(7.8)	164(92.1)
Age			
15-25	165	6(3.6)	159(96.4)
26-35	127	11(8.6)	116(91.3)
36-45	111	6(5.4)	105(94.6)
Occupation			
Governmental employee	96	1(1.04)	95(98.9)
Merchant	5	-	5(100)
Daily labor	78	7(8.9)	71(91)
Driver	8	-	8(100)
Student	108	2(1.8)	106(98)
Others*	108	13(12)	95(89.9)
Marital Status			
Married	161	5(3.1)	156 (96.9)
Divorced/widowed	30	2(6.6)	28(93.3)
Single	212	16(7.5)	196(92.5)
Educational level			
Illiterate	36	3 (8.3)	33(91.6)
Read and write	38	3(7.8)	35(92.1)
Elementary	120	14(11.6)	106(88.3)
Secondary and Preparatory	123	2(1.6)	121(98.4)
TVET	8	-	8(100)

Diploma and above	78	1(1.2)	77(98.7)

*Stands for house wife, job seeking, tea house workers and commercial sex workers.

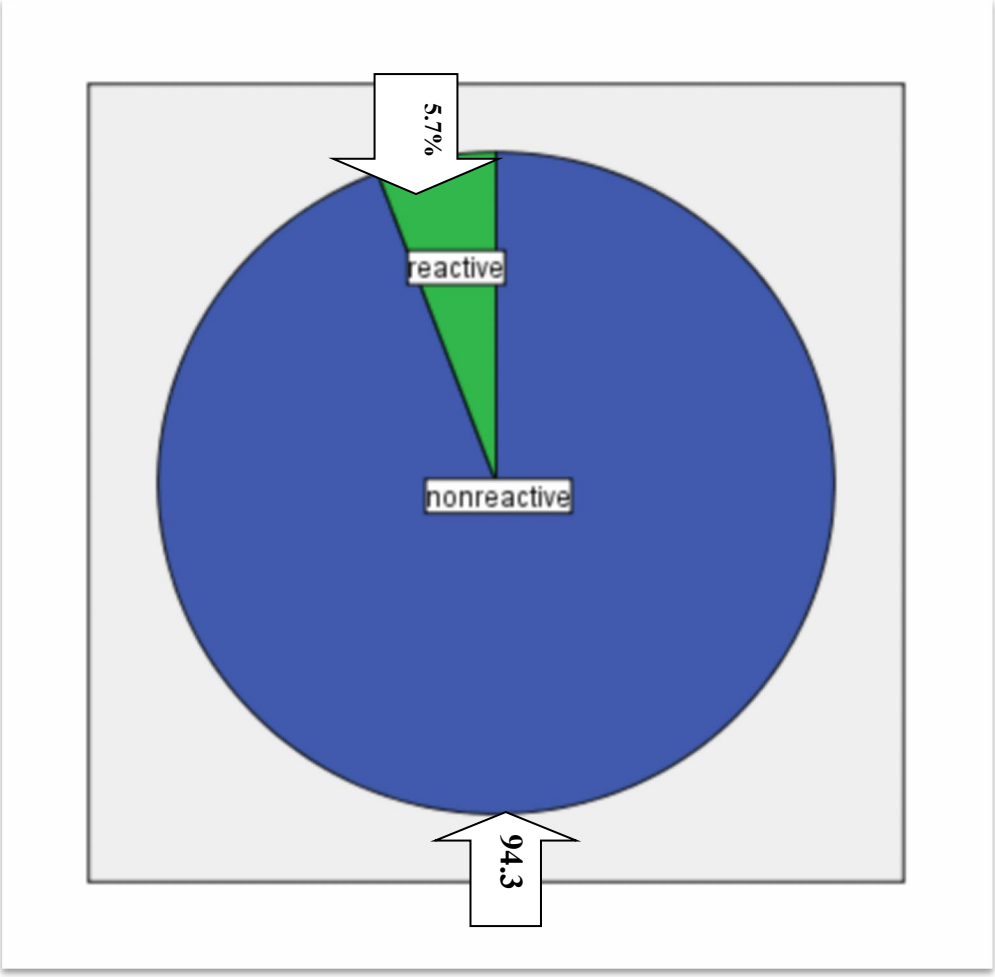


Figure 6 Prevalence of HIV among 403 respondents

4.2. Factors associated with HIV infection

The independent variables computed in the case of being HIV positive by using binary logistic regression through crude odd ratio and adjusted odd ratio. Here the independent variables in which its P-values were less than 0.05 in regression analysis.

Among independent variables sex, age, marital status, substance use, having constant sexual partner, having free discussion with family and previous HIV test history were legible for multivariate analysis that is p value >0.25 in binary logistic regression. In multivariate analysis age, marital status, having constant sexual partner, substance use and having free discussion with family about HIV were significant factors which determine HIV infection. Those respondents whose age between 26 to 35

years were had 5.2-time (AOR = 5.25(1.66-16.56)) compared to the other age group risk for HIV infection. Unmarried individuals (single) also had 8.5 times (AOR = 8.53 (2.16-33.66) the other marital status more likely to HIV infection. Study subjects that have no free discussion with their family about HIV 4.8 (AOR = 4.78 (1.62-14.11) times more likely for HIV.

Table 6: Multivariate analysis showing the prevalence of HIV infection in socio- demographic characteristics among Bichena and Yetmen towns health centers in 2023.

		Test result		COR	AOR	p-value
		Nonreactive	Reactive			
Sex	Male	216(96.0%)	9(4.0%)	1	1	
	Female	164(92.1%)	14(7.9%)	2.04(0.86-4.85)	2.51(0.97-6.53)	0.058
Age	**15-25**	159(96.4%	6(3.6%)	1	1	
	26-35	116(91.3%)	11(8.7%)	2.51(0.90-6.99)	5.25(1.66-16.56)	0.005*
	36-45	105(94.6%)	6(5.4%)	1.51(0.47-4.82)	3.41(0.61-18.94)	0.159
Marital status	Married	156(96.9%	5(3.1%	1	1	
	Single	196(92.5%)	16(7.5%)	2.54(0.91-7.10)	8.53(2.16-33.66)	0.002*
	Divorced/widowed	28(93.3%	2(6.7%)	2.22(0.41-12.05)	3.34(0.52-21.56)	0.203
Constant sexual partner?	**Yes**	196(97.5%)	5(2.5%)	1	1	
	No	184(91.1%)	18(8.9%)	3.83(1.39-10.54)	3.37(1.08-10.48)	0.036*
Tested HIV before?	**Yes**	232(96.3%)	9(3.7%)	1		
	No	148(91.4%)	14(8.6%)	2.43(1.02-5.77)	1.51(0.48-4.72)	0.479
use drugs	**Yes**	220(93.6%)	15(6.4%)	1.36(0.56-3.29)	4.07(1.33-12.44)	0.014*
	No	160(95.2%)	8(4.8%)	1		
discuss	**Yes**	240(96.4%)	9(3.6%)	1		

freely	**No**	140(90.9%)	14(9.1%)	2.66(1.12-6.32)	4.78(1.62-14.11)	0.005*

4.3. Analysis of interviewed questionnaires

The researcher tried to interview about 8 of the health professionals and 2 health administrative bodies in Bichena and Yetmen Health Centers about the prevalence of HIV/AIDS and its risky factors in the towns. Just about 100% of the interviewed individuals said that the prevalence of HIV in the town is aggravated which is more than the previous years. HIV affects all sexes, ages, religion, educational status and ethnic groups. They said that Bichena and Yetmen have many customers meaning many people migrate from rural areas to the town for the sake of finding jobs, long traveler drivers are settled, and there are also so many daily labors. They said that many students, commercial sex workers and daily labors in the towns paid for sex and they were carried out unsafe sexual intercourse.

According to the interview, the current prevalence rate of HIV in the towns was 5.3%.In addition about 90% of the interviewed individuals said that the main reasons for the prevalence of HIV in the towns were used unsafe sex, not being faithfulness to their sexual partner, and improper use of condom. About 10% of them said that divorcing, using addictive drugs, having sex before blood examination and migration of people to the town for daily labors and practicing unsafe sex aggravate the prevalence of HIV within the towns. About 80% of them said that commercial sex workers, long traveler drivers, daily labors and students are affected by HIV and nearly 20% of them said that governmental employers, commercial sex workers and daily labors are more vulnerable to HIV.

About 100% of them said that people who are living with HIV will be given care and support in different aspects such as in getting antiretroviral drug, counting of their CD_4 and measuring viral load (not to be greater than 1000 copies/ml) regularly, psychological treatments (in family members, friends, and health professionals) and encouraging in participating in social services such as “Equip and Eder”. In addition to these they said that they will be educated in ways of using ART drugs, ways of getting nutrition and in using condom properly. About 70% of the interviewed individuals said that VCT service in the town is good and most of the time couples, commercial sex workers, long traveler drivers, pregnant womens and then others are given in taking VCT. About 30% of the interviewed individuals said that now a day’s VCT service is restricted since there is shortage of HIV experimental kit. They

said that priority is given for those of risky groups such as commercial sex workers, long traveler drivers, daily labors, family members of ART, pregnant womens and then others.

4.4 Retrospective data of prevalence of HIV/AIDS in Bichena and Yetmen Health Centers

Bichena and Yetmen are the hotspot areas of prevalence of HIV/AIDS in Amhara Regional State. The prevalence of HIV/AIDS in Enemay woreda in the year from 2018-2022 in Table 10.

Table 7: Retrospective data of prevalence of HIV/AIDS in Bichena and Yetmen Health Centers from 2018-2022 according to Ministry of health age classification.

Year	Total No of people who took VCT			People were HIV positive			Age groups of HIV positive individuals											
							15-19			20-24			25-49			50&above		
	M	F	T	M	F	T	%M	F	T	M	F	T	M	F	T	M	F	T
2018	383	426	809	17	16	33	4.1	-	-	-	-	-	11	12	23	6	4	10
%				1.4	3.8	4.1												
2019	1458	1407	2868	20	22	42	1.5-	-	-	-	1	1	17	21	38	2	-	2
%				1.4	1.6	1.5												
2020	672	735	1407	9	19	28	2-	1	1	-	-		8	17	25	1	1	2
%				1.3	2.6	2												
2021	1087	1156	2243	21	19	40	1.8	-	-	-	-	-	19	19	38	2	-	2
%				1.9	1.6	1.8												
2022	14	11	25	8	5	13	52	-	-	-	1	1	3	6	9	2	1	3
%				57.1	45.5	52												

Note that even though this research was carried out in the prevalence of HIV/AIDS and its risky factors in Bichena and Yetmen towns' health centers, the data in the registration book list of these Health Centers didn't show the Keble of the clients. So the researcher was forced to take the woreda retrospective data of prevalence of HIV/AIDS in Bichena and Yetmen Health Centers. From the above

data, there was higher HIV infection among the individuals found in the age group between 25-49 years rather than the others and least in the age of 50 and above. The number of people who were tested HIV in 2019 were greater than the other preceding years. The percent of total HIV positive individuals in 2018 and 2022 were higher than the years in 2019, 2020 and 2021. In 2022 prevalence HIV was 52% higher than 2018 about 4.1% in 2018

5. DISCUSSION

The total prevalence of HIV in this study was 5.7% which is consistent with studies at Mozambique (6%), Uganda (6%), but higher than studies conducted at Malawi (4%), (CVM ,2016) and Ethiopia (3%). In addition, this finding is lower than southern and eastern Africa, South Africa (25%), and Nigeria (13%) (Piol et al., 2015*).* HIV infection is a significant public health problem particularly in developing countries, including Ethiopia and it is one of the leading causes of illness and death in Bichena and Yetmen towns, this is due to that of many migrant commercial sex workers who are coming from other towns, daily labors coming from rural areas, long traveler drivers are customers and settled there and practice unsafe sex and others are some of the contributing factors according to the report of CVM in 2016,

In addition, the finding of the prevalence in this finding is higher than the 0.95% and 0.2% HIV prevalence reported in Southern Nigeria (Bello, 2014). and USA (Slogrove *et al.,*2017) respectively. The finding of the prevalence of HIV in this study is also higher than the finding of (EDHS, 2011) in which the HIV prevalence is 1.5% this could be due to socio demographic difference between study area and time difference between previous conducted researches and this study(Woldemariame and Gezahegn,2018). The high prevalence of HIV infection might be associated with difference in socio-cultural situations among countries, awareness about HIV transmissions, life styles and risky sexual practice such as sex with commercial sex workers, daily labors and inconsistent use of condom. In this study, the prevalence of HIV infection was higher in females than males and this finding was consistent

with the expected national prevalence (FMoH, 2012) and (Whitmore *et al*., 2012). Which noted that young women residing in developing countries are more susceptible to HIV infection.

The prevalence of HIV infection among age group 26-35 years old individuals is five times higher (AOR =5.25) than other age groups this might be due to greater risks to factors such more sexually active but it is not consistent with the findings which is done in the Ethiopia context studies which showed that the highest prevalence of HIV was observed in the young age group of 15-24 years as compared to middle and older age groups for both sexes (Woldemariame and Gezahegn,2018)
when we see the role of marital status to HIV prevalence, relatively high rate of HIV infection was observed among unmarried individuals (AOR =8.53 CI 2.16-.33.66) compared to married and divorced or widowed ones and this is consistent with the study conducted by (Carael *et al*., 2001) on HIV within behavioral risk groups using sample surveys data conducted in Kampala and Lusaka showed relatively higher rates of HIV infection in unmarried than in married people. However this is inconsistent with the findings explained in Zimbabwe (Mulu *et.al.,* 2014). in which married individuals were more exposed to HIV infection from their HIV infected spouse due to low frequency of condom use within marriage and also the high frequency of extramarital sex among men. In addition, the finding of this study is inconsistent to the report of study of (EDHS/CSA,2011) in which the likelihood to be HIV positive among widowed and divorced was higher than among those who had never been married.

In the finding of this research, the risk of HIV infection increases as the level of education decreases and this is consistent with the study done in Tanzania revealed that the low education was significantly associated with higher risk of HIV infection (Mmbaga *et al*., 2007). Similar result was observed in another study which was done in India where low education was significantly associated with high risk of HIV infection (Brahme *et al*., 2005). However this finding is inconsistent with a systematic review of developing countries revealed contradictory results showing higher educational status associated with high risk of HIV infection (Hargreaves *et al*., 2002).

In this study, it was found that individuals who are governmental employers, elementary and TVET students, and drivers are less likely infected by the epidemic than the individuals who are tea house workers, job seekers and daily labors. Most of the time the infection occurred in people migrates from rural to urban areas for the sake of better job since they always practice unsafe sex to everybody including commercial sex workers. Poor young men and women have participated in these activities to

make up a significant amount of the total population. Since these individuals are far from their home and environment, it leads them to have casual and unsafe sex with bar ladies due to the parallel increase of commercial sex workers (UNAIDS, 2010). So in this finding, practicing unsafe sex takes the higher percentage for the prevalence of HIV in the studying area.

In this research, the findings showed that individuals in the studying site about 97% and 90.5% have awareness about the disease of HIV/AIDS and its modes of transmission and prevention methods respectively. However, this finding is inconsistent with the findings (EDHS, 2011) conducted in Ethiopia in which knowledge of HIV about modes of transmission and prevention methods are not high.

The respondents cited that most frequently television and schools are the main sources of information about HIV and VCT service respectively. This finding is consistent with the studies (Alemu, 2004) and (Andargie *et al*., 2007) which showed that mass media is the most frequently reported sources of information. The potential to use media and Anti-AIDS clubs to promote youth VCT service is also supported by the research findings from the Kenya (Gemechu, 2013) According to the findings of this study, just about n=154(38.2%) of the respondents did not talk freely about HIV to their family members because of the fear of rejection, discrimination and isolation about what they were doing sexual contacts before This is less than research conducted (Zemenu *et al*., 2016) that found 43% and also Similarly less than 52% research conducted (Andualem Henok *et al*., 2015). About n=207 (51.4%) of the respondents didn't practice sex since 65.2% of them said that sex before marriage isn't needed. In the study about n=202 (50.2%) of the respondents didn't have constant sexual partner at all. This tells some of them have many sexual partners and practice unsafe sex. In this study, about n=196 (48.6%) of the respondents admitted having sexual experience before marriage and this is inconsistent with the study compared to other studies in USA and Canada, which showed low figures about 9.9% reported as admitted premarital sexual experience (MOH/HAPCO, 2005).

In this finding, the use of condom during sexual intercourse in the study participants was low just about 40.3 % (n=79) consistent with the findings in DHS of Ethiopia, condom use was extremely low among the adolescent (EDHS, 2005). In this finding, about 59.8%(n=241) of the study participants have taken VCT service before while 40.2% (n=162) of them didn't take VCT at all and this figure is considerably high when compared to DHS 2005 report in Ethiopia, which was only 14% of the population aged 15-49 years had been tested for HIV (Tegegne *et al.*, 2021). and the study done in Mersa among the population aged 15-49 years which was 26.1% (Bsc, 2011) In this finding, 41.7 %(n=168) of the study

subjects didn't use intravenous drugs whereas 58.3 % (n=235) of them used addictive drugs such as khat, tobacco, alcohol and others. Practicing of these activities aggravate infection of HIV Comparable study (Wondemagegn *et al.,* 2014) with (AOR=4.07(1.33-12.44) of alcohol and khat showed that, how participants who drug use were 4.07 times more likely to have risky sexual behavior than who did not use drug and Similar findings were also observed in studies conducted in southwest, Ethiopia, revealed that Youths who drink alcohol were more than two times more likely to engage in risky sexual behavior (Fantahun *et al*., 2014). The finding of this study is inconsistent with studies reported as substance abuse causes loss of inhibition and involvement in risky sexual behaviors such as unprotected sex, multiple sexual partners, prolonged and traumatic sex (Tura, 2012).

.

.

6. CONCLUSIONS AND RECOMENDATION

6.1. Conclusions

This study was the first step to understand the prevalence of HIV/AIDS and its risk factors in Bichena and Yetmen towns' health centers. Health centered based cross sectional study was done and the blood specimens of the study participants tested for the presence of antibody to HIV infection using HIV rapid diagnostic tests. The total prevalence of HIV in the present study was 5.7%. Most of HIV positive study participants were found in the age group of 26-35 years and their marital status was single. The majority of HIV positive study subjects were job seekers, tea house workers, commercial sex workers and daily labors. Age, marital status, having constant sexual partner, substance use and having free discussion with family members were significant factor which determine HIV risk.

6.2 Recommendations

- The integrated prevention approaches including, sexual education, risky sexual practices, in reducing having multiple sexual partners, and access to reproductive health services should be started to protect infection of HIV.
- Religious and community leaders are highly respected by the people and have to assist the young people by giving them a consistent set of messages regarding HIV/AIDS.
- Health professionals of Bichena and Yetmen towns should work in collaboration in educating the society to prevent themselves from infection of HIV, in reducing the newly infection of people and in encouraging them in taking VCT services.

- ❖ Schools should work hard in exercising the anti-HIV/AIDS club in and outside the school communities to forward the current situation of HIV/AIDS and manage the spread of the disease.

.

7. REFERENCS

Albright, Kendra(2007). "HIV/AIDS information seeking and healthcare communications in Sub-Saharan Africa." In *Proceedings of the 73rd IFLA General Conference and Council*.

Alemu, S., Abseno, N., Degu, G., Wondemkun,Y. and Amsalu, S. (2004). Knowledge and attitude towards voluntary counseling and testing for HIV, A community based study in North West Ethiopia.*Ethiop.J.Health Dev.***18**: 82-8.

Andargie, G., Kassu, A., Moges, F.,(2007). Low prevalence of HIV infection, and knowledge, attitude andpractice on HIV/AIDS among high school students in Gonder, Northwest Ethiopia**.** *Ethiop.J.Health Dev.***21(**2):179-182.

Andualem Henok1, Anteneh Kassa, Astehun Lenda, Atalay Nibretand Tafesse Lamaro. (2015). Knowledge, Attitude and Practice of Risky Sexual Behavior and Condom Utilization among Regular Students of Mizan-Tepi University, South West.*J Child Adolesc Behav*, 3:5

Barré-Sinoussi, F.,(2023). AIDS: FACTS, FICTION, AND FUTURE. *The Nobel Collection-Volume 1*, 14.

Beegl, K. and Walque, D. (2009). Demographic and Socioeconomic patterns of HIV/AIDS

Bello, Y. (2014). AWARENESS AND KNOWLEDGE OF HIV/AIDS AMONG NIGERIAN UNIVERSITY STUDENTS

Bonato, M.(2015) "A pilot study of brisk walking in sedentary cART-treated patients."

Brahme, RG., Sahay, S., Malhotra-Kohli, R., Divekar, AD., Gangakhedkar, RR., Parkhe, AP., Kharat, MP., Risbud, AR., Bollinger, RC., Mehendale, M. and Paranjape, RS.(2005). High-risk

behavior in young men attending sexually transmitted disease clinics in Pune, India. *AIDS Care***17***(3)*:377-85.

Bsc, B. T. (2011). *Willingness to home based HIV counseling and testing service among residents in Chagni town administration and Guangua wereda, West Amhara region* (Doctoral dissertation, Addis Ababa University)

Carael, M., Ali, M. and Cleland, J., (2001). Nuptiality and Risk Behaviour in Lusaka and Kampala. *African Journal of Reproductive Health,* (**1**): 83-89.

Central Statistical Agency, Addis Ababa, Ethiopia (2005). Ethiopian Demography Health Survey (EDHS) (2006).

Cohen, M. S., Council, O. D., & Chen, J. S. (2019). Sexually transmitted infections and HIV in the era of antiretroviral treatment and prevention: the biologic basis for epidemiologic synergy. *Journal of the International AIDS Society*, *22*, e25355

Collins, J. and Bill, R. (2000).”AIDS in the context of Development.” UNRISED program on social Policy and Development, paper number 4. March. Genev

CommunitaVolunter Mission (CVM) 2016. Report of CommunitaVoluntar Mission (CVM) about the current prevalence rate of HIV/AIDS in Ethiopia, 2016.

Daniel, W. W., & Cross, C. L. (2018). *Biostatistics: a foundation for analysis in the health sciences*.

Wondemagegn, M., Bayeh, A., Mulat, Y. (2014). Prevalence of Human Immuno-deficiencyVirusinfection andassociated factors among students at Bahir Dar University *Ethiop.J. Health Dev.* **28**(**3**)Africa RegionalHuman Development and Ministry of Health Ethiopia.

EFED (2022). Enemay woreda finance and economic development. Annual report, Unpublished.

Ethiopia Demographic and Health Survey (EDSH) (2008). Ethiopia Atlas of key Demographic and Health Survey.

Ethiopia Demographic and Health Survey (EDHS) 2011. Data from the 2011 Ethiopia Demographic and Health Survey.

Family Health International (FHI), Deborah Boswell and Rachel Baggaley (2002). Voluntary counseling and testing (VCT) and young people.

Federal Democratic Republic of Ethiopia Pharmaceutical Fund and Supply Agency (PFSA), 2016)

Federal Ministry Of Health (FMOH) (2012). Country Progress Report On HIV/AIDS Response. Addis Ababa, Ethiopia: National HIV/AIDS Prevention and Control office.

Fentahun, N. & Mamo, A. (2014). Risky sexual behaviors and associated factors among male and female studentsin Jimma Zone preparatory schools, South West Ethiopia: comparative study. *Ethiopian journal of healthsciences.***24(1)**:59–68Zemenu

Fernández-Luis, S., Fuente-Soro, L., Nhampossa, T., Lopez-Varela, E., Augusto, O., Nhacolo, A., ... &Naniche, D. (2022). Prompt HIV diagnosis and antiretroviral treatment in postpartum women is crucial for prevention of mother to child transmission during breastfeeding: Survey results in a high HIV prevalence community in southern Mozambique after the implementation of Option B+. *PloS one*, *17*(*8*), e0269835.

FMOH, Federal HIV/AIDS Prevention and Control Office (2007) Guidelines for HIV Counseling and Testing in Ethiopia.

FMOH/HAPCO (2007). Single point HIV prevalence estimate

FMOH/HAPCO (2007). Single point HIV prevalence estimate .Federal Ministry Of Health (FMOH) (2012). Country Progress Report On HIV/AIDS Response. Addis Ababa, Ethiopia: National HIV/AIDS Prevention and Control office

Gatta, A. A., & Thupayagale-Tshweneagae, G. (2012). Knowledge of, and attitudes towards, Voluntary HIV Counselling and Testing services amongst adolescent high school students in Addis Ababa, Ethiopia. *curationis*, *35*(*1*), 1-8.

Gatta, Abraham Alemayehu(2011). *Knowledge and attitude towards voluntary counselling and testing (VCT) services among adolescent high school students in Addis Ababa, Ethiopia*. Diss. University of South Africa,

Gemechu, A. (2013). Assessment of Voluntary Counseling and Testing Service Utilization among Youths: A Case of Gelemso High School A thesis Report Submitted to Indira Gandhi National Open University School of Social Work in Partial Fulfillment for the Master Degree of Social Work.

HAPCO, Federal Democratic Republic of Ethiopia (2006). Report on, Progress towards Implementation of the Declaration of Commitment on HIV/AIDS, Addis Ababa Ethiopia, Joint publication of IPPF South Asia Regional Office and UNFPA (2004) ;Integrating HIV voluntary Counseling and Testing Services into Reproductive Health Settings.

Hargreaves, JR. (2002). Socioeconomic status and risk of HIV infection in an urban population in Kenya. *Trop Med Int Health,* **7**(*9*):793-80

Hemelaar, Joris, et al.(2011) "Global trends in molecular epidemiology of HIV-1 during 2000–2007." *AIDS (London, England)* 25.5 : 679.

Idele, P., Gillespie, A., Porth, T. and Suzuki, C. (2014). Epidemiology of HIV and AIDS among Adolescents, current status, inequalities and data gaps. Acquire immune Deficiency syndrome 66; S144-S153.

Idemyor, Vincent (2006). "Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome: Clinical Testing Challenges." In *The Process of New Drug Discovery and Development*, pp. 477-490. CRC Press.

Jeremy S, Yvonne P, Kathleen D, and Jesus S. (2010). HIV and anti-HIV Drugs.

Joint United Nation Programme on HIV/AIDS (2012). Global Report: UNAIDS report of global AIDS epidemic Geneva, Switzerland: Joint United Nation Programme on HIV/AIDS (2012). Available from: United Nations Programme on HIV/AIDS (UNAIDS); the gap Report ISBN; 2014

Kerani, R. P., Satcher Johnson, A., Buskin, S. E., Rao, D., Golden, M. R., Hu, X., & Hall, H. I. (2020). The epidemiology of HIV among people born outside the United States, 2010-2017. *Public*

Kharsany, A. B., & Karim, Q. A. (2016). HIV infection and AIDS in sub-Saharan Africa: current status, challenges and opportunities. *The open AIDS journal*, *10*, 34.

Leshargie, C. T., Demant, D., Burrowes, S., & Frawley, J. (2022). Incidence and predictors of mortality among adolescents on antiretroviral therapy in Amhara Region, Ethiopia: a retrospective cohort analysis. *BMJ open*, *12*(*11*), e063879.

Mmbaga, EJ., Hussain, A.,Leyna ,GH., Mnyika, KS., Sam, NE. and Klepp, KI. (2007). Prevalence and risk factors for HIV-1 infection in rural Kilimanjaro region of Tanzania: implications for prevention and treatment. *BMC Public Health,***19**; 7:58

Moghaddam, H. T., Bahreini, A., Abbasi, M. A., Fazli, F., &Saeidi, M. (2016). Adolescence Health: the needs, problems and attention. *Int J Pediatr*, ***4***(**2**), 1423-1438.

MOH/HAPCO (2005). HIV/AIDS Behavioral Surveillance Survey (BSS), Ethiopia.MoH (2001-2005). Strategic framework for the National Response to HIV/AIDS in Ethiopia, Addis Ababa.

Mohammed, A., T. Tefera, and M. Ahmed(2015). "Knowledge, attitude and practice on HIV/AIDS prevention among batu terara preparatory school students in Goba Town, Bale Zone, Southeast Ethiopia." *Primary Health Care* 5, no. 192: 1-6

Muganda, R. and Otieno, A.(2003). Knowledge, Attitudes and Practice of secondary school Adolescents towards VCT in Kenya.

Mulu, W., Abera, B., & Yimer, M. (2014). Prevalence of Human Immunodeficiency Virus infection and associated factors among students at Bahir Dar University. *The Ethiopian Journal of Health Development*, ***28***(**3**).

Nadarzynski, T., Frost, M., Miller, D., Wheldon, C. W., Wiernik, B. M., Zou, H., ... & Llewellyn, C. (2021). Vaccine acceptability, uptake and completion amongst men who have sex with men: a systematic review, meta-analysis and theoretical framework. *Vaccine*, ***39***(27), 3565-3581

Nanyombi, E. (2019). Effects of drug abuse on HIV/AIDS patients in Central Division, Jinja Municipality

Neema, S., Musisi, N.andKibombo, R. (2004). Adolescents sexual and reproductive Health in Uganda: A synthesis of research evidence, occasional report, New York: The Allan Guttmacher Institute. NoNwachukwu, NC.andOril, A. (2008). Sero-prevalence of human immunodeficiency virus among some fresh Nigerian graduates. *Res J Immunol,***1**: 51-55.

Nematahe, M. N. (2023). *Impact of pulmonary tuberculosis and HIV/AIDS co-infection in self-management among adult patients at the primary health care facilities in Bojanala District of North-West Province* (Doctoral dissertation)..

Owen BSc and Nigel O'Farrell (2007). Rapid HIV testing in a clinic setting *International Journal of STD & AIDS,***18**: 418-419(20)

Rees, H., Beksinska, M., Dickson-Tetteh K., Ballard, R.andHtun, Y.(2000). Commercial sex workers in Johannesburg; risky behavior and HIV status. *South Africa Journal of science.* Vol.96,283-284

Regassa, N. (2022). The trajectories of population impact and the promises of harnessing the benefits ofdemographic dividend in Ethiopia: A perspective. *Age*, *120*, 2-58..

RETA, H. (2017). *ADHERENCE TO ANTIRETROVIRAL THERAPY AND ASSOCIATED FACTORS AMONG ADULT PEOPLE LIVING WITH HIV/AIDS: THE CASE OF YERGALEM HEALTH CENTER, SOUTHERN, ETHIOPIA* (Doctoral dissertation, ST. MARY'S UNIVERSITY)..

Setty, M. K. H. G., & Hewlett, I. K. (2014). 10 Human Immunodeficiency Virus. *Manual of Security Sensitive Microbes and Toxins*, 107.

Slogrove, A. L., Mahy, M., Armstrong, A., & Davies, M. A. (2017). Living and dying to be counted: What we know about the epidemiology of the global adolescent HIV epidemic. *Journal of the International AIDS Society*, *20*, 21520.

Srivastava,s.,Sharma, S., Mohan, A., Kadhiravan, T. HIV/TB co-infection: epidemiology, diagnosis

Tegegne, E. T., Tessema, M. K., & Tegegne, K. T. (2021). Magnitude of HIV testing and socio demographic factors associated with it among adults age 15-49 years in Ethiopia. *International Journal*, *7*(1), 1.),

Tura ,G.andAlemseged ,F .and Dejene ,S.(2012). Risky sexual behavior and predisposing factors among students of Jima University Ethiopia. *Ethiop J health Sci,***22**: 170 - 80

UNAIDS (2004). Report on global AIDS epidemic; 4th global report, Geneva.

UNAIDS (2010). Report on the Global AIDS Epidemic,Geneva: UNAID

UNAIDS (2012). UNAIDS report on AIDS epidemic Global fact sheet.2012.

UNAIDS (2014) .World Aids Day 2014 Report-Fact sheet.

UNAIDS (2016) .Review of data from people living with HIV Stigma Index Survey conducted in more than 65 countries.

UNAIDS (2017).Ending AIDS; progress towards the 90-90-90 targets.

UNAIDS(2002). HIV voluntary counseling and testing case study, Geneva, Switzerland.

UNAIDS/WHO (2006). policy statement on HIV testing.

UNAIDS/WHO (2007) .Global summary of the AIDS epidemic update.

Waweru, G., & Korir, J. (2019). The Impact of HIV/AIDS Expenditure on HIV/AIDS Incidence Rate in Sub-Saharan Africa .

Whitmore, S. K., Kann, L., Prejean, J., Koenig, L. J., Branson, B. M., Hall, H. I., & Valleroy, L. A. (2012). Vital Signs: HIV Infection, Testing, and Risk Behaviors Among Youths--United States. *MMWR: Morbidity & Mortality Weekly Report*, **6***1*(47).

WHO, Regional Committee for Africa (2006) HIV Prevention in the African Region: A Strategy for Renewal and Acceleration

Williams, B.,Gilgen ,D.,Campbell, C., Taliaard ,D.andMacphail, C.(2000). The natural history of HIV/AIDS in south Africa; A biomedical and social survey in Carletonville. Council for scientific and industrial research. Johnnesburg.

Woldemariame, S. H., & Gezahegn, T. T. (2018). *Factors Determining the Prevalence of HIV/AIDS in Ethiopia*. LAP LAMBERT Academic Publishing..

Woldemariame, S. H., & Gezahegn, T. T. (2018). *Factors Determining the Prevalence of HIV/AIDS in Ethiopia*. LAP LAMBERT Academic Publishing.

World Health Organization (2001). HIV/AIDS in Asia and the Pacific region. Geneva, Switzerland; WHO.

World Health Organization. (2012). WHO, UNODC, UNAIDS technical guide for countries to set targets for universal access to HIV prevention, treatment and care for injecting drug users–2012 revision.

World Health Organization. (2015). Global health sector response to HIV, 2000-2015: focusoninnovations in Africa: progress report.

Zemenu Yowhanes, Hailemariam Berhe & Desta Hailu, (2016). Assessment of Parent-Adolescent Communicationabout Sexual and Reproductive Health among High School Students in Mekelle Town, NorthernEthiopia.*Global Journals Inc.(USA).,*16(2).

APPENDICES

Appendix I

Addis Ababa Univesity

School of Post Graduate Students

General Instraction:

Dear respondents, this questionnaire has been designed for to gather information on your awareness level of HIV/AIDS related knowledge, attitude and practice in your towns most of the questionnaire are too personal which requires your willingness to write honest information your genuine responses will have a great value on the outcomes of this research. Most of the questionnaires are in multiple choice forms, so you kindly requested to give your information by putting (X) symbol on the box or circle your choice. Additionally you are invited to write additional information on the space provided if necessary As much as possible the researcher would like to attempt all 17 items people attending HIV test and 5 questionnaires for health administrative bodies and health professionals. Finally would like to express my heartfelt thanks for your contribution.

Title;"' Prevalence of HIV/AIDS infections and associated risk factor among individuals attending Bichena and Yetmen Health centers, East Gojjam Zone, Amhara region. Addis Ababa Univesity

School of Post Graduate Students

General Instraction

Prevalence of HIV/AIDS infections and associated risk factor among individuals attending Bichena and Yetmen Health centers in Enemay woreda, Amhara Regional state, Ethiopia

REQUIRED ELEMENT

To assess the prevalence of HIV/AIDS and its risk factors in Enemay Woreda. The findings of this study will have a significance use in identifying the risk factors for the prevalence of HIV infection in the study area. Besides to this, it also helps to know the current situation of HIV/AIDS in the towns and gives feedback in reducing the mortality of people due to HIV/AIDS in the towns. This finding can also be used as the base line data for further studies

OPTIONAL ADDITIONAL ELEMENTS

Inclusion and Exclusion Criteria

Inclusion Criteria

Individuals who were 15-45 age attending in Bichena and Yetmen health centers for HIV/AIDS test were included in this study due to the leading cause of death at these age group.

Exclusion Criteria

Individuals who were below the age of 15 and above 45 ages were excluded in this study due to leas leading cause of death at age group.

REQUIRED ELEMENT

- By using supported letter ask permission to do the research in selected health centers.
- With the stud period collect the data that is the blood specimen and questionnaire.
- Analyze collected by using SPSS with Version 25 statistical software was used.
- Work on my finding
- Discus my finding with other related research conducted.
- Finlay work on conclusion and Recommendation.

A. Area of identification
    1. Woreda……
    2. Kebele…….
    3. House No……
B. Particulars of the study subject

1. Sex ☐ male ☐ female
2. Age……..
3. Occupation……..
4. Religion……..
5. Marital status (single, married, divorced/ widowed) (under line)
6. Education (illiterate, read and write only, elementary school, secondary and preparatory, TVET, diploma and above) (under line)

1. Do you know about HIV/AIDS?

☐ Yes ☐ No

2. From the above question, if you say yes from where do you get the information?

A. School
B. TV
C. Radio
D. Friends
E. Others (encircle your answer)

3. Have you ever had sex before marriage?

☐ Yes ☐ No

4. From the above question No 3 if you say yes to whom do you first practice sex?

A. Commercial sex worker
B. Domestic worker
C. Student
D. Daily labor
E. Driver
F. Others (encircle your answer)

5. From the above question No 3 if you say no, what is your reason?

A. No sex before marriage
B. No sex before testing (VCT)
C. To prevent pregnancy
D. Others (encircle your answer)

6. Do you have constant sexual partner?

☐ Yes ☐ No

7. Do you have an interest to use condom during sexual intercourse?

☐ Yes ☐ No

8. Have you ever used condom during sexual intercourse?

☐ Yes ☐ No

9. From the above question No 8 if you say yes, from where did you get it?

A. Health institute
B. School
D. Restaurants and hotels
E. Others (encircle your answer)

C. Kebele office

10. Do you know about ways of transmission of HIV/AIDS?

☐ Yes ☐ No

11. What are the ways of transmission of HIV infection in your town?

A. Unsafe sex
B. Mother to child
C. Improper condom use
D. No faithfulness to sexual partner
E. Transfusion of infected blood
F. Others (encircle your answer)

12. Which methods do you use to prevent HIV/AIDS?

A. Abstinence
B. Being faithfulness to sexual partner
C. Use condom
D. Avoiding blood contact
E. Avoiding sharing of sharp materials
F. Others (encircle your answer)

13. Have you been tested HIV before?

☐ Yes ☐ No

14. Do use drugs such as khat, tobacco, alcohol or others?

☐ Yes ☐ No

15. Do you have your own scissors, razor, needle at your home?

☐ Yes ☐ No

16. Do you discuss freely about HIV/AIDS in your family members?

☐ Yes ☐ No

17. Final HIV test result ☐ reactive ☐ nonreactive

Interview questionnaires for health administrative bodies and health professionals

1. How do you describe the currently prevalence of HIV/AIDS in Bichena and Yetmen towns health centers?
2. According to your opinion, what are the risk factors for the prevalence of HIV/AIDS in your town?
3. Based on your experience which individuals or group of society are more vulnerable to HIV/AIDS in Bichena and Yetmen towns?
4. How do HIV positive individuals get cares and support from the concerned bodies?
   How does VCT service is practiced in Bichena and Yetmen towns health centers?

AppendicsII

ውድተሳታፊያችን!

የዚህመጠይቅዋነኛአላማበእነማይወረዳበቢቸናእናበየትመንከተማየኤችአይቪኤድስበሽታስርጭትንናለበሽታውመስፋፋት መንስኤየሆኑትንጉዳዩችለመለየትናለመረዳትነው።በመሆኑምበዚህጥናትለመሳተፍሙሉፈቃደኛበመሆንዎለሚያደርጉትአ ስተዋጽኦሁሉእያመሰገንንመጠይቁንበሚሞሉበትወቅትስምመፃፍአያስፈልግም።ማብራሪያከፈለጉመጠየቅእንደሚቻልና መልስዎትንበጥያቄውመሰረትእንዲሰጡንማስገንዘብእንወዳለን።

ሀ/በጥናቱተሳታፊየሆነው/ችው/ ሰውየሚገኝበት

1. ወረዳ---------- ቀበሌ----------የቤትቁጥር ----------

ለ/በጥናቱተሳታፊየሆነው /ችው/ሰው

1. ፆታወንድ ☐ ሴት ☐
2. ዕድሜ----------
3. ስራ----------
4. ሀይማኖት----------
5. የጋብቻሁኔታ /ያላገባ/ች፣/ያገባ/ች/፣በሞትየተለያት/ችው፣የተፋታ/ች/ መልስዎትንያስምሩበት/
6. የትምህርትደረጃ /ያልተማረ/ች/፣ማንበብናመፃፍየሚችል /የምትችል/፣የመጀመሪያደረጃት/ም/ት፤ከፍተኛ 2ኛደረጃት/ቤት፣ቴክኒክ፣ዲፕሎማናበላይ /መልስዎትንያስምሩበት/

1. ስለኤችአይቪኤድስበሽታምንነትታውቃለህ/ታውቂያለሽ?

አዎ ☐ የለም ☐

2. ከላይላለውመጠይቅመልስዎአዎከሆነ፤መረጃውንከየትታገኛለህ/ሽ?

ሀ/ ከት/ቤት ለ/ ከቴሌቪዥን ሐ/ ከሬዲዩ መ/ ከጓደኛ ሠ/ ከሌሎችመልስህንመልስሽንአክብብ /ቢ/

3. ከጋብቻበፊትየግብረስጋግንኙነትአድርገህ/ሽ/ ታውቃለህ/ሽ/?

አዎ ☐ የለም ☐

4.ከላይበቁጥር “3” መልስህ/ሽ/ አዎከሆነ፣ለመጀመሪያጊዜየግብረስጋግንኙነትየፈፀምከው/ሽው/ ከማንጋርነው?

ሀ/ ከሴተኛአዳሪ ለ/ ከቤትሰራተኛ ሐ / ከተማሪ መ/ ከቀንሰራተኛ ሠ/ ከሹፌር

ረ/ ከሌላጋርመልስህንመልስሽንአክብብ /ቢ/

5. ከላይበተራቁጥር “3” ላለውመጠይቅመልሰህ/ሽ/ የለምከሆነምክንያቱምንድንነው?

ሀ/ ከጋብቻበፊትየግብረ- ስጋገንኙነትስለማያስፈልግ ለ/ ከምርመራበፈትየግብረ-ሰጋግንኙነትስለማያስፈልግ

ሐ/ እርግዝናንለመከላከል መ/ በሌላ /መልስህን/ሽንአክብብ /ቢ/

6. ቋሚየሆነየፍቅርጓደኛአለህ/ሽ/?

አዎ ☐ የለም ☐

7. በግብረ- ስጋግንኙነትወቅትኮንዶምየመጠቀምፍላጎትአለህ /ሽ/?

አዎ ☐ የለም ☐

8. በግብረ-ሰጋግንኙነትወቅትኮንዶምተጠቅመህ/ሽ/ ታውቃለህ/ሽ/?

አዎ ☐ የለም ☐

9.ከላይበተራቁጥር 8 መጠይቅመልስህ/ሽ/ አዎከሆነኮንዶሙንከየትአገኘህ/ሽ/

ሀ/ ከጤናተቋም ለ/ ከት/ቤት ሐ/ ከቀበሌአስተዳደር መ/ ከሬስቶራንትናከሆቴል

ሠ/ ከሌላመልስህንመልስሽንአክብብ /ቢ/

10. ስለኤችአይቪበሽታመተላለፈያመንገዶችታውቃለህ/ሽ/

አዎ ☐ የለም ☐

11. ከኤችአይቪኤድስበሽታመተላለፈያመንገዶችውስጥከፍተኛውንድርሻየሚይዘውየትኛው

ነውትላለህ/ሽ/

ሀ/ ልቅየሆነየግብረ-ስጋግንኙነትለ/ ከእናትወደልጅ ሐ/ ኮንዶምንበአግባቡባለመጠቀም

መ/ አንድለአንድባለመወሰን ሠ/ በኤችአይቪየተበከለደምልገሳ ረ/ በሌላመልስህንአክብብ /ቢ/

12. ከሚከተሉትአማራጮችውስጥኤችአይቪኤድስንለመከላከልየትኛውንዘዴትጠቀማለህ/ሽ/

ሀ/ መታቀብ ለ/ አንድለአንድመወሰን ሐ/ ኮንዶምመጠቀም መ/ የደምንክኪንበመከላከል

ሠ/ ሰውነትንሊበሱየሚችሉመሳሪያዎችንበጋራአለመጠቀምመልስህንመልስሽንአክብብ /ቢ/

13. ከዚህበፊትበፈቃደኝነትላይየተመሰረተየደምምርመራአድርገህ/ሽ/ ታውቃለህ/ሽ/?

አዎ ☐ የለም ☐

14. አደንዛዥእፅችንለምሳሌ፡- ጫት፣ሲጋራ፣አልኮናሌሎችንትጠቀማለህ/ሽ?

አዎ ☐ የለም ☐

15. በቤትህ/ሽ/ ውስጥየራስህ/ሽ/ የሆነመቀስ፣ምላጭ፣መድፌአለህ/ሽ/?

አዎ ☐ የለም ☐

16.ከቤተሰብህ/ሽ/ጋርስለኤችአይቪኤድስበሽታግልጽየሆነውይይትታደርግለህ/ታደርጊያለሽ?

አዎ ☐ የለም ☐

17.የአንተ/የአንቺየደምምርመራዉጤት

በደሙዉስጥኤችአይቪያለበት ☐ በደሙዉስጥኤችአይቪየሌለበት ☐