SciencePG
Science Publishing Group

Assessment of HIV Sero-Prevalence among St. Marry University Students, Ethiopia

Zewdu Shewangizaw[1, *], Mesert Girma[2], Getabalew Endazenaw[3]

[1]Arbaminch University, College of medicine and health sciences, Department of Public health, Arbaminch, Ethiopia
[2]Arbaminch University, College of medicine and health sciences, Department of Nursing, Arbaminch, Ethiopia
[3]Ambo University, College of medicine and health sciences, School of Nursing and Midwifery, Ambo, Ethiopia

Email address:
hweret@gmail.com (Z. Shewangizaw), meseretgirma_abate@yahoo.com (M. Girma), eyobgetabalew@gmail.com (G. Endazenaw)

Abstract: Background: The HIV global epidemic continues to be the most serious of infectious disease challenges to the public health and it remains as a major threat to socioeconomic development. AIDS accounts for a leading cause of mortality and resulted in the deaths of 25 million people. Everyday 5,700 persons die from AIDS worldwide. The HIV prevalence in the student populations hadn't adequately studied, but there is some undependable reports suggesting widespread of unsafe sexual practices making the young vulnerable to HIV infection. Hence the current study assesses HIV Sero-prevalence among St. Marry University students in Ethiopia to narrow the gap of studies in the young population. A cross sectional study design with self-administered questioners and clinical blood specimen collection were done among 900 St. Marry University, Ethiopia study participant in March, 2012. The sample size were determined with single population formula with considering none respondent rate. Statistical tests were carried out for HIV Sero positivity and its association to predisposing factors to HIV infections. Detail explanation were given the study participant, a written consent was obtained from each participant after clear explanation to the procedure, merits and demerits of being tested for HIV. The study shows, 98.7% of response rate. According to the finding the overall HIV Sero-prevalence among the participants was found to be 3.8% and more specifically, HIV prevalence shown among students come from urban areas 14(5.7%), small town15 (4.5%) and rural areas 5(1.6%). Unsafe sexual behaviors, risky habits of styles of life involving alcohol beverages drinking, chat chewing, substance use, drug abuse, men to men sex, change and exchange of several sex partners, rapes, revealed positive association with HIV positive Sero status. HIV remains as a serious health problem to those who were positive as well as to those who practice risk behaviors and comparably, lower prevalence of HIV was noticed in the study. There is a need to be further studies in depth for contributing factors which predispose to new HIV infection to prevent HIV infection among the late adolescence and adult population. Moreover, as a result of higher institution expansion, there is a need to provide organized HIV prevention activities to decrease HIV new infection.

Keywords: Adherence, Substance Use, Rape, Peer, Risk Behavior, Higher Institution

1. Background

The human immune virus (HIV) global epidemic continues to be the most serious of infectious disease challenges to the public health and it remains as a major threat to socioeconomic development.[1, 2, 3] United Nations joint special program against HIV/AIDS (UNAIDS) has estimated 33 million people living with HIV/AIDS (PLWHA) in 2007 worldwide. Out of which the sub-Sahara Africa (SSA) is the most heavily affected by HIV, accounting for 67% of all PLWHA .The annual number of new HIV infections declined from 3 million in 2001 to 2.7 million in 2007.

Among this figure young people, from age 15–24 account for 45% of all new HIV infections in adult.[4]

Acquired Immune-deficiency Syndrome (AIDS) accounts for a leading cause of mortality and resulted in the deaths of 25 million people. Everyday 5,700 persons die from AIDS worldwide. AIDS is the primary largest cause of death and disease burden in the SSA. An estimated number of deaths due to AIDS in 2007 were 2.1 million all over the world and out of which 76% occurred in the SSA .[1]

HIV is likely to reduce economic growth in

high-prevalence countries by 0.5% to 1.5% over a period of 10–20 years with an impact that is notable. It causes slow economic growth, widen economic inequality, and causes severe strains on affected households .[4]

In Ethiopia, the first two AIDS cases were reported in 1986 [5] and earlier Sero-positivity survey at the country level was carried out among 5,565 soldier recruits in 1984-85 showed a prevalence of 0.07% [6]. At the beginning, the epidemic was concerted in large towns of the country following commercial routes .[6] Two years later High rate of HIV prevalence was detected among female sex workers inhabiting and working along the main trade highways, 17% and long distance truck drivers, 13%. [7] Since then, HIV epidemic has been progressively spread to reach every corner of the country.

A moderately recent report in the country estimated that a total number of PLWHIV infection was 1,037,267 in the year 2008 with the prevalence of 2.2% (female 2.6 % vs. male 1.8 %) and (Urban 7.7 % vs. rural 0.9 %) [8]. On the other hand, in Ethiopia the HIV prevalence became stable in most of the major urban centers, while reversely rising in the smaller towns.[6]

The majority of HIV infection cases are found in the productive age group, 15-64 years. Of all people living with HIV /AIDS in Ethiopia, it was estimated that young people within the age group 15-24 years had the highest prevalence of 5.6%.[9] This has an overwhelming effect on the socio-economic development of the country. [10]

The HIV prevalence in the student populations hadn't adequately studied, but there is some undependable reports suggesting widespread of unsafe sexual practices making the young vulnerable to HIV infection.[6] Meanwhile information about the trend of HIV prevalence in the university students, who are potential developmental work forces of the country, is lacking, it is difficult to measure accurately the recent spread of HIV in these groups and their position in the further spread of HIV to the general population .[6]

Based on the statistical evidence, HIV has become the irresistible national crisis in all its aspect by affecting economic and developmental resources of the country. [11]

HIV and sexual behavior trends among young people is a proposition to a recent developments in, and the likely evolution of countries' HIV epidemics .[1] Young people are at constant risk for HIV infection because of their high risk sexual behaviors. According to center for disease control, youth risk behavioral survey (CDC's YRBS), many young people begin having sexual intercourse at early ages: 47% of high school students have had sexual intercourse, and 7.4% of them reported first sexual intercourse before age 13 and this predisposes them at risk for HIV infections[12]. The other risk factor is the acquiring of sexually transmitted diseases (STD) greatly increases a person's likelihood of getting or transmitting HIV infection. Some of the highest STD rates are among young people who are sexually active and those who practice unsafe sex with multiple sexual partners, alcohol, cigarette smoking, and other drugs abusers.[13] Both occasional and habitual substances users are more likely to

engage in high-risk behaviors, such as unprotected sex, when they are under the influence of drugs or alcohol.[14] The socioeconomic status associated with poverty can directly or indirectly increase the risk for HIV infection on young people. [15]

CDC study has shown that early and clear parent-child communication regarding values and expectations about sex is an important step in helping young people to delay sexual initiation and make responsible decisions about sexual behaviors later in their lives. Parents are in a unique position to engage their children in conversations about HIV and STIs, because the conversations can be ongoing and timely.[16] Schools also can be important partners for reaching young people before high-risk behaviors are established, as evidenced by the YRBS.[12]

In Ethiopia, HIV/AIDS study had been conducted in different public universities among students (Addis Ababa, Gondar and Jimma) indicate that students who were involved in unprotected sex with casual partners do not recognize that they are at risk of HIV infection. Despite their knowledge about HIV/ AIDS its modes of transmission and prevention, a large number of students had sexual contact with high risk individuals. It was only small number of students that practiced safer sex .[17] A study carried out on 572 Jimma University students suggested that students at their final year and older ones (22-24 years) respectively had an increased likelihood of being sexually experienced than their first year and younger (17-19 years old). [18]

Another study from the same University students showed that HIV Sero-prevalence was found to be 12.2% in 2002 with the highest prevalence in students who chew chat, drink alcohol and cigarette smokers.[3] However, there is no comprehensive and accurate information on HIV prevalence among higher education students in Ethiopia; Universities are the places where the future hope and young educated working forces are produced for the economic development of a given country.[19]

With these all sexual risk behaviors of university students, the prevalence of HIV/AIDS and associated factors has not been well studied. Assessing the prevalence of the problem among this group gives some clue about the potential impact of the problem and is useful to design effective preventive intervention for the future hopes of educated working forces of the county. Therefore, this study would be estimate the magnitude of HIV prevalence and its associated factors among the student of St. Marry University, Addis Ababa, Ethiopia.

2. Methods

2.1. Study Design

A cross sectional study design were conducted at St. Marry University in March 2012.

2.2. Study Population, Sample Size Determination and Sampling Procedure

All randomly selected students from each college of St. Marry which were represented the source population. Sample size was determined by using the assumption of single population proportion formula by using Epi Info version 3.4 sample size calculation methods. The assumption was that the expected HIV prevalence, 12.2% based on the previous study done in the year 2004 on HIV Sero-prevalence in Jimma University.3 Thus, by using the assumption of Prevalence of 12.2%, expected margin of error of 2 % within a 95 % of CI in addition to a non-response rate of 10 % the sample size were calculated. The total sample size was calculated for estimation of the study subjects was distributed to the size of the students in each faculty by using probability proportional allocation technique. According to the above assumption the maximum sample size was 900. A combination of stratified and simple random sampling technique was carried out to allocate the sample proportionally to the size of students in each faculties. The faculty then further stratified by year of student (year 1-3). Finally simple random sampling were employed to select study subjects from the sample frame by using SPSS Version 15 software program.

2.3. Data Collection Procedures and Tool

Data collection done by three senior laboratory technicians and two trained voluntary counseling and testing(VCT) nurses after they got training on specimen data collection and testing. Pretest were done on 5 % of total sample size of the study subjects on Rift valley University to ensure the reliability and internal consistency of the questionnaire and the quality of rapid viral detection kits. The kit has known positive and known negative controls and the time each test took and the color change occurred was assessed. Intermediate results were further tested using next confirmatory steps with the respective reagents. On the other hands, pre-tested and validated self-administer questionnaire was used to ask the selected participants. The questionnaire was adapted from other similar studies and Behavioral surveillance survey (BSS) questionnaires, which included demographic characteristics, sexual behaviors, substances abuse, violence and knowledge and communications on HIV/AIDS and institutional factors. A number ranging from W001 to W900 was written immediately after each VCT. At the end of each self-administered questionnaire, a drop of blood was collected by the technicians and entered the same number ranging from W001 to W900 on the kit upon completion of collection each blood specimen and was detected for viral reactivity. Disposable sterile finger prick needles, capillary tubes disinfectants (hypochlorite, alcohol and soaps, gloves, mouth masks, cotton were used for pricking of fingers for blood collection and transferring it for rapid HIV testing. Each drop of blood was transferred onto the slide. A Modified Algorithm technique for HIV rapid testing was carried out following its standard procedures. Results were recorded reactive or non-reactive and post- test counseling were given after the test result.

2.4. Data Quality Control, Management, and Analysis

In order to assure the data quality the study used standard tool, training, close supervision, use of expertise as data collector, pre-tested in the respective sample collection and detection. Data entry, clearance was employed and analyzed by using SPSS, version 15, statistical software. Each Sero -positive or negative specimen following its corresponding code entered into the SPSS statistical software. Statistical tests were carried out for HIV Sero positivity and its association to predisposing factors to HIV infections. For each independent variable, frequencies, odds ratio at 95% C.I and P-value at alpha 0.05 was calculated. Association between dependent and independent variables; accepting the VCT results as outcome variable and socio-demographic, high risk sexual behavior, substance abuse violence and knowledge on HIV/AIDS, independent. Multi logistic regression was computed to control the effect of confounders. Interpretation and inferences were made and results were presented in tables and figures.

2.5. Ethical Clearance

Ethical clearance were given from the St. Marry University research and publication office. Regarding to ethical issue towards the study, detail explanation were given the study participant, a written consent was obtained from each participant after clear explanation to the procedure, merits and demerits of being tested for HIV. Clarification was given on the safety of specimen collection and its safety procedures. Explaining the details of procedures and use of anonymously kept test results.

3. Results

3.1. Socio-Demographic Characteristics

Among the study sample, a total of 893 study subjects were participated in the study with 98.7 % of response rate. With respect to their residence, most of them336 (37.8%) dwell in town. By ethnicity, Amhara and Oromo constituted 245(27.5%) and 172(19.4%) respectively followed by 100(11.3%) Gurage. As religion, 462(52%) and 304(34.2%) were Orthodox Christians and Protestant respectively followed by Muslims 89(10%). About gender, 598 (67.5%) males and 288 (32.5%) were females.

Among the participants, half 444(50%) were in the age group 18-20 years old. The mean age of the participant were 20.81 year (S.D±1.721) with a range between 18 -38 years. Majority734 (82.6%) of the study participant were unmarried,

In perspective of family income, 349(41.0%) were reported they had a monthly income less than Birr 600.00 and approximately the same number of other students' families 343(40.2%) had monthly income of Birr 600.00 to 2000.00 during the study period. Most of students' 745(84.4%) income sources were from their parents. see table 1 below.

Table 1. Selected socio - demographic characteristics of St. Marry University students, Ethiopia, March 2012.

Variables	Frequency(n)	Percentage (%)
Residence		
Urban	246	27.7
Small town	335	37.7
Rural	307	34.5
Age		
18-20	444	50
21-24	414	46.6.
25+	30	3.4
Marital status Married		
Single	67	7.6
Divorced	730	82.5
Boy/ friend girl	6	.7
Friend	82	9.3
Family Income		
<600.00	349	41.0
601-1200.00	226	26.5
1201 – 2000.00	117	13.7
greater than2001.00	96	11.3
others	39	4.6
difficult to specify	25	2.9
Student Monthly expense		
>300.00 birr	124	14.2
<300.00 birr	752	85.8

3.2. HIV Sero-Prevalence with Respects to Socio-Demographic Characteristics

The overall HIV Sero-prevalence among the participants was found to be 3.8%. HIV prevalence shown among students come from urban areas 14(5.7%), small town15 (4.5%) and rural areas 5(1.6%). Sero-status by region revealed that HIV prevalence student from Somali, Benshangul and Oromiya regions with their respective prevalence of 3(30%), 1(5.3%) and 6(3.8%). Concerning religion HIV prevalence was high among catholic follower followed by Muslims and the least were in orthodox followers. Distribution by sex 16(5.6%) for females was nearly twice higher than males 18(3%). The study depicts that Sero-positivity was higher among divorced student 3(50%) followed by married 6(9.0%), those who have boy girlfriend 6(7.3%) and lower as compared to among those who had no partner 19(2.6) at the time of survey. Regarding to the study, in inter-faculty, ethnicity and religion have no statistically significant association with sero-positivity see table two below.

Table 2. HIV prevalence by selected socio-demographic characteristics of students of St. Marry University, March 2012.

Socio-demographic characteristics	HIV Prevalence					
	Positive No (%)	Negative No (%)	95% CI	P-Value	COR	AOR(95%CI)
RESIDENCE						
Urban	14 (5.7)	232 (94.3)	1.29 –10.26	0.014	3.65	3.91(1.25-12.22)
Small town	15 (4.5)	321(95.5)	1.01 –7.86	0.047	2.82	2.50(0.82-7.60)
Rural R	5 (1.6)	302 (98.4)	1			1
REGION						
Addis Ababa R	1(1.6)	63(98.4)	1			1
SNNPRS	15(3.6)	369(96.1)	33 - 19.73	.250	2.26	4.60(0.56-37.86)
Tigray	2(3.20	49(96.1)	227 - 29.28	.367	2.57	4.431(0.38-5.995)
Afar	0(0)	5(100)		.446		
Amhara	6(3.2)	179(96.8)	0.25- 17.88		2.11	3.20(0.35-9.11)
Benshangul	1(5.3)	18(94.7)	0.21- 58.77	.493	3.50	5.87(0.34-10.66)
Dire Dawa	0(0)	5(100)		.384		
Gambela	0(0)	4(100)				
Harare	0(0)	4(100)				
Oromiya	6(3.8)	152(96.2)	0.29-21.079	0.403	2.49	4.44(0.049-9.77)
Somali	3(30)	7(70.0)	2.464-95.87	0.007	27.00	30.47(2.74-33.01)

R: Reference, CI: confidence interval: LCI: lower confidence interval, UCI: upper confidence interval, COR: crude odd ratio, AOR: adjusted odd ratio

3.3. Association Between HIV Sero Positivity and Sexual Behavior, Sexually Transmitted Disease, Violence and Rape

Of all the respondents 331(37.2%) reported having had sexual intercourse. Among sexually active respondents high HIV prevalence of 4(28.6%) ,16(15.7%), 2(15.4%) is observed among raped students, those who had sexual relationship to get relief from stress from their sexual drive and among those who had sexual relationship for better grade

respectively.

Unadjusted analysis of raped and those who had sexual intercourse for relief of sexual drives were significantly associated with Sero-positivity at p <0.005). High prevalence of 2(40.0%), (22.7%), (21.4%) ,(12.5%) and (10.9%) was observed in those who had sexual relationship with person who had sexually transmitted infections(STIs), occasional partners, old women/men ,casual partners and commercial sex worker(CSW) respectively. Having sexual relationship with

occasional partners and persons who had STI have statistically significant association with HIV prevalence at P<0.05. In addition to this significantly high Sero positivity of 9(20.9%) , 6(20.0), 8(12.9%) and 20(17.7%) were observed, in respondents who had more than three, three and two partners, with the pattern of frequent change and exchange of partners respectively. In contrast to this, the prevalence 1(0.9%) was low among those who were strictly always condom users. Sero positivity was high 10(27.8%) and 4(22.2%) in anal sex and homosexual practicing as compared to (9.2%) heterosexual (Table 3).In the meantime sexually transmitted disease (STD) [AOR.95%CI, 5.727(1.678-19.553)] and [AOR.95%CI, 4.674(1.302-16.773)] within the last 12 months had statistical significant association. (With p-value<0.001).

Table 3. *HIV prevalence by sexual risk behavior of students of St. Marry University, March 2012.*

Sexual risk behaviour	HIV prevalence					
	Positive No (%)	Negative No (%)	95% CI LCI - UCI	P-Value	COR(95%CI)	AOR(95%CI)
No. of partner(s)						
0ne [R]	10(5.1)	186(94.9)	1			1
two	8(12.9)	54(87.1)	1.04-7.32	0.004	2.76	2.02(0.716-5.71)
three	6(20.0)	24(80)	1.55-13.94	0.042	4.65	4.42(1.38-14.15)*
>three	9(20.9)	79.1(34)	1.86-13.01	0.006	4.92	4.56(1.57-13.21)**
Pattern of sexual relationship						
Single partner [R]	13(6.0)	205(94.0)	1			1
Frequent change and exchange of partner	20(17.7)	93(82.3)	1.62-7.11	0.001	3.39	1.06(0.28-4.03)
Mode of sexual intercourse						
Virginal [R]	23(7.8)	273(91.7)	1			1
Anal	10(27.8)	26(72.2)	1.96-10.62	0.000	4.57	3.70(1.47-9.28)***
Type of sexual relationship						
Heterosexual [R]	29 (9.2)	285(90.8)	1			1
Homosexual	4(22.2)	14 (77.8)	0.62 -8.48	0.085	2.81	
condom use						
Strictly always [R]	1(0.9)	107(99.1)	1.95-127.61	0.010	15.79	11.89(1.42-9.37)*
Occasionally	9(12.9)	61(87.1)	1.88-14.35	0.011	16.72	10.15(1.103-9.40)*
Most of the time	5(13.5)	32(86.5)	2.55-14.45	0.004	19.46	18.92(2.44-14.87)**
Never use	18(15.4)	99(84.6)	1			1
Reason for Sexual relationship						
love expression R	8(5.3)	143(94.7)	6.14-17.20	.050	2.25	1.25(0.20-7.79)
To gain better grade	2(15.4)	11(84.6)	0.25-20.11	.166	2.23	2.23(0.20-25.43)
Life threatening reason	1(11.1)	8(88.9)	1.83-27.88	.473	7.15	4.28(1.01-18.18)**
Rape	4(28.6)	10(71.4)	0.32-8.16	.005	1.63	1.68(0.30-9.50)
Peer pressure	2(8.3)	22(91.1)	1.37-8.10	.555	3.33	2.02(0.72-5.67)
To get relief from stress	16(15.7)	86(84.3)	1			1
Type of partner						
Regular partner R	16(7.2)	206(92.8)	1			1
CSW	1(12.5)	7(87.5)	0.21-15.89	0.580	1.84	
Casual	5(10.9)	41(89.1)	0.55-4.53	0.404	1.57	
Occasional	5(22.7)	17(77.3)	1.24-11.60	0.020	3.78	
Person with STD	2(40.0)	3(60.0)	1.34-55.14	0.023	8.58	
Person with multiple	1(8.3)	11(91.7)	0.14-9.65	0.884	1.17	
partner Old women/men	3(21.4)	11(78.6)	0.89-13.88	0.073	3.51	

Foot Note: *P-value <0.05 **P-value <0.005 **P-value<0.001 COR: crude odds ratio, AOR: adjusted odds Ratio.

R: Reference, CI: confidence interval: LCI: lower confidence interval, UCI: upper confidence interval.

3.4. HIV Prevalence by Use of Substances and Leisure time Management

The style of life of the study subjects were analyzed and indicate that the prevalence was high 16(8.6%), 13(11.2%), 7(24.1%), and 26(7.9%) respectively among alcohol drinkers, chat chewers, cigarette smokers and pornographic movie watchers as compared to their counterparts. (Significantly associated with p. value, < 0.001). High prevalence of 14(26.9%) and 7(22.6%) and (1.6%) among shisha, hashish and cocaine users as compared to their counterparts of non-users of these is significantly associated with P-Value <0.001 in crude analysis as indicated in (Tabe-4) below.

Table 4. HIV prevalence by use of substances and drugs and life the life style of students of St. Marry University March 2012.

Variable	HIV –prevalence					
	Positive No (%)	Negative No (%)	95% CI LCI UCI	P-Value	COR (95%CI)	AOR (95%CI)
Drinking alcohol						
Yes	16(8.6)	170(91.4)	1.94-8.05	0.000	3.95	1.81(0.71-4.62)
No	16(2.3)	671(97.7)	1			1
Chewing chat						
Yes	13(11.2)	103(88.8)	2.34-0.18	0.000	4.88	0.887(0.31-2.52)
No	19(2.5)	735(97.5)	1			1
Cigarette smoking						
Yes	7 (24.1)	22 (75.9)	4.03- 26.34	0.000	10.31	3.17(0.93-10.8)
No	25 (3)	810 (97)	1			1
Watching Movies						
Pornographic moves	26(7.9)	305(92.1)	2.12-17.86	0.001	6.16	6.68(1.40-14.89)**
Non-Pornographic moves	4(1.4)	289(98.4)	1			1
Drug abuse						
Non-users	13 (1.6)	792(98.4)	1			1
Hashish and cocaine users	7 (22.6)	24 (69.6)	6.51-48.52	0.000	17.77	21.51(5.62-82.32)***
Shisha users	14 (26.9)	38 (72.5)	9.87 -1.07	0.000	22.45	16.325.42-49.14)***

Foot Note: *P-value <0.05 **P-value <0.005 **P-value<0.001 COR: crude odds ratio, AOR adjusted odds Ratio.
R: Reference, CI: confidence interval: LCI: lower confidence interval, UCI: upper confidence interval.

3.5. Bivariate Association of Information, Communication and Perception of Respondents Regarding HIV/ADIS

Among the respondents the majority 95.7% had adequate knowledge about most of the common modes of HIV transmission and their prevention. High and significant Sero-positivity 6(21.4%) was observed among those with inadequate knowledge as compared to the respondents with adequate knowledge 25(3.0%) is significant with (P-Value <0.001).

Those who hadn't open discussion with their partners, pears, parents and have risky perceptions have higher Sero-positivity 14(13.0%), 13(9.8%), 29(5.3%), 13(10.2%) respectively had statistical significant with p-value <0.05 and<0.001 in crude analysis. Similarly, respondents who had current risky sexual behaviors 25(25.5%) and the non-preventive life style their sexual practices 21 (24.4%) have high prevalence Sero-positivity and show statistically significant at [COR: 26.526, 95%CI :(11.917, 9.044)] and [COR: 18.21, 95%CI (7.987, 41.540)] see table 5 below.

Table 5. HIV prevalence by information, communication and perception of students of St. Marry University, March 2012.

Variable	HIV –prevalence					
	Positive No (%)	Negative No (%)	95% CI LCI UCI	P-Value	COR (95%CI)	AOR(95%CI)
Discussion with parents about sexual matters						
Yes	5(1.4)	341(98.6)	1			1
No	29(5.3)	514(94.7)	1.48-10.04	0.001	3.85	3.86(1.09-13.67)*

Variable	HIV –prevalence					
	Positive No (%)	Negative No (%)	95% CI LCI UCI	P-Value	COR (95%CI)	AOR(95%CI)
Discussion with partners about sexual matters						
Yes	17(4.4)	367(95.6)	1			1
No	13(9.8)	119(9.2)	1.11-5.10	0.025	2.36	0.55(0.17-1.76)
Current sexual behavior:						
Protective behavior	9(1.3)	685(98.7)	1			1
Unsafe behavior	25(25.5)	73(74.5)	11.92-9.04	0.000	26.53	19.85(4.84-21.53)***
Peers discouraging condom use						
Yes	14(13.2)	92(86.8)	1			1
No	18(2.3)	763(97.7)	2.72-11.87	0.000	5.67	1.09(0.81-8.30)
Peers with multiple sexual partners						
Yes	18(11.8)	135(88.2)	1			1
No	15(2.0)	718(98.0)	3.14-12.97	0.000	6.38	11.14(3.56-34.51)***
Life style of sexual relationship:						
Preventive behavior	9(1.8)	488(98.2)	1			.1
Risky behavior	21(24.4)	65(75.6)	7.99-41.54	0.000	18.22	8.96(1.77-45.55)***
Knowledge about HIV transmission						
Yes	25(3.0)	811(97.0)	3.3.10-23.73			5.01(0.84-29.93)
No	6(21.4)	22(78.6)	1	0.000	8.85	1
Risk Perception						
Yes	3(10.2)	15(89.8)	1.94--8.03			2.519(0.77-8.22)
No	21(2.8)	740(97.2)	1	0.000	3.98	1
Tested prior to this test						
Yes	10(1.9)	527(98.1)	1.82—8.17			4.830(1.822-12.80)**
No	24(6.8)	328(93.2)	1	0.000	3.86	1

Foot Note: *P-value <0.05 **P-value <0.005 **P-value<0.001 COR: crude odds ratio, AOR: adjusted odds Ratio.
R: Reference CI: confidence interval: LCI: lower confidence interval, UCI: upper confidence interval.

3.6. Relationship of HIV Sero Positivity with Its Covariates in Multiple Logistic Regression Analysis

As the statistical logic in order to control the effects of cofounding variable, multiple logistic regression model were applied for variable which have association in bivariate logistic regression. Variables from socio -demographic perspectives, being from urban dweller is 3 times higher odds of having HIV infection than from small town dwellers and rural residence [AOR: 3.912, 95% CI: (1.25, 12.22)]. The odds of having HIV Sero-positivity in married student is 3 times higher than the odds of no partner [AOR: 4.657, 95% CI :(1.574-13.780)]. The other socio demographic variables that remains in model, the odds of having HIV Sero-positivity among students and their monthly expenses >300.00 birr and supported by their boy/girl friend is 3 and 4 times higher the odds of students whose monthly expense <300.00 birr and supported by their family [AOR: 3.312, 95% CI: (1.457, 7.521) and 4.906, 95% CI: (1.168, 20.606)] respectively.

Sexual behavior over the HIV Sero-positivity were computed and number of life time partners three and above, condom non-users or irregular condom users and rape history have strong association with having HIV Sero-positivity. Having single partner and strict condom use were found to be protective from exposure to HIV infection [AOR: 4.559, 95% CI: (1.574, 13.207), and 18.924, 95% CI: (2.438, 146.873)].

Regarding to socio demographic, sexual risk behavior and substances use and life style over the HIV Sero-positivity, variables which are, watched pornographic movies[AOR: 6.676 95% CI: (1.395,14.890), hashish [AOR:21.506,95% CI: (5.618,82.321)] and shisha users[AOR:6.318 ,95% CI: (5.419,49.141)]were had significance association with high risk for HIV positive Sero status. Other predictor variables like open discussion with their parents, with their sexual matters, their current risky sexual behaviors, HIV testing prior to this test shown significant association as table 6 shows below.

Table 6. *Summary of the backwards stepwise multiple logistic regression analysis to HIV Sero-positivity at, St. Marry University, March, 2012.*

Variable	HIV –prevalence					
	Positive No (%)	Negative No (%)	95% CI LCI UCI	P-Value	COR	AOR(95%CI)
Residence						
Urban	14 (5.7)	232 (94.3)	1.29-10.26	0.014	3.65	3.912(1.25-12.22)*
Rural [R]	5 (1.6)	302 (98.4)	1			1
Marital status						
Single [R]	19 (2.6)	711(97.4)	1			1
Married	3(50)	61 (91.0)	0.13-87	0.025	3.38	4.66(1.57-13.78)**
Separated/Divorced		3 (50)	2.088- 76..88	0.000	12.67	132.14(10.35-150.03)***
The average money the student spent per month						
<=300birr	21 (2.8)	731(97.2)	1			1
>300birr	11 (8.9)	113 91.1)	1.59-7.21	0,002	3.39	3.31(1.46-7.52)**
Income source						
Parent [R]	29 (3.5)	809(96.5)	1			1
Girlfriend/boyfriend	3 (20.0)	12 (80)	1.87-6.07	0.004	6.97	4.90(1.17-20.61)*
Mode of sexual intercourse						
Virginal [R]	23 (7.8)	273(91.7)2	1			1
Anal	10(27.8)	6(72.2)	1,96-10.62	0.000	4.57	3.695(1.47-9.28)***
No. of partner(s)						
0ne [R]	10(5.1)	186(94.9)	1	0.004		1
Three	6(20.0)	24(80)	1.04-7.33	0.006	4.65	4.42(1.38-14.15)*
>three	9(20.9)	79.1(34)	1.86-13.01	0.001	4.92	4.54(1.57-13.21)**
condom use						
Strictly (always) [R]	1(0.9)	107(99.1)	1			1
Occasionally	9(12.9)	61(87.1)	1.95-127.61	0.010	15.79	11.89(1.42-99.37)*
Most of the time	5(13.5)	32(86.5)	1.88-148.35	0.011	16.72	10.15(1.10-93.40)*
Never use	18(15.4)	99(84.6)	2.55-148.45	0.004	19.46	18.92(2.44-146.87)**
Reason or Sexual relationship						
Love expression [R]	8(5.3)	143(94.7)	1	050		1
Rape	4(28.6)	10(71.4)	1.83-27.88	0.005	7.150	4.28(1.01-18.18)**
STD						
Yes	9 (25)	9 (25)	1			1
No	25 (4)	596 (96)	3.38-18.67	0.000	7.974	5.73(1.68-19.55)**
Rape						
Yes	7(36.8)	12(63.2)	1			1
No	8(3.1)	249(94.6)	5.65-58.39	0.000	18.156	4.67(1.30-16.77)**
Watching Movies						
Pornographic moves	26(7.9)	305(92.1)	2.12-17.86	.001	6.159	6.68(1.40-14.89)**
Non-Pornographic moves	4(1.4)	289(98.4)	1			1
Drug abuse						
Non-users	13 (1.6)	792(98.4)	1			1
Hashish and cocaine users	7 (22.6)	24 (69.6)	6.51-48.52	0.000	17.77	21.51(5.62-82.32)***
Shisha users	14 (26.9)	38 (72.5)	9.87-51.10	0.000	22.45	16.32(5.42-49.14)***
Discussion with parents about sexual matters						
Yes	5(1.4)	341(98.6)	1.48-10.04	0.001	3.85	3.86(1.09-13.67)*
No	29(5.3)	514(94.7)	1			1
Current sexual behavior						
Protective behavior	9(1.3)	685(98.7)	1			1
Risky behavior	25(25.5)	73(74.5)	11.92-9.04	0.000	26.53	19.85(4.84-1.38)***

Foot Note: *P-value <0.05 **P-value <0.005 **P-value<0.001 COR: crude odds ratio, AOR: adjusted odds Ratio.
R: Reference CI: confidence interval: LCI: lower confidence interval, UCI: upper confidence interval.

4. Discussion

In this study, the overall HIV Sero-prevalence among the participants was found to be 3.8%. There is variability among study subjects from urban, small towns and rural residence. The study also further tries to assess Sero prevalence by their sexes, sexually active young respondents, risk sexual behaviors, prevalence of HIV in relation to their style of life, knowledge and perception about HIV. The prevalence in this study is higher than that of the national adult projected HIV prevalence (2.3%) for the year 2009. However, the prevalence rate in this study is nearly four times higher than the prevalence (1.1%) among 565 Gondar high school students for the same age. Comparing with studies from the west, it is much higher than a study carried out in the USA among 17 university students with Sero-prevalence of 23(0.2%).On the other hand, the current Sero-prevalence were twice lower than the antenatal care(ANC) sentinel surveillance prevalence (5.6%) done in Ethiopia, in 2005 among young women 15-24 year. Moreover, the prevalence of this study is three times lower than that of a previous study in southwest Ethiopia among 490 students in one of the Universities in the country.[3] Meanwhile, the current study finding is consistent with the prevalence of all blood donors (3.7%) in Ethiopia, 2005 and Sero-prevalence study from Nigeria among university fresh graduates indicated a Sero-positivity of 3.05% which is nearly similar to the current finding.[20]

Besides, there is change in sexual risk behavior among the respondents in this study. Most of the participants showed a high rate of sex abstinence, followed by strict condom uses. They responded to have chosen a faithful one to one sexual partner after having known their HIV Sero status. Comparatively lower prevalence was observed among the respondents came from rural area, in the place where low epidemic in the country, nearly half of the participants (43%) came from the SNNPR, i.e. regional prevalence of 1.6%.[28]

HIV prevalence with respect to their previous residence is three times higher in urban centers than in rural areas. This prevalence is two times higher than that of in small towns followed by in rural areas. This is in line with epidemiologic synthesis [6] by stating that the epidemic is higher than expected in small towns. This can be explained by changing HIV exposing risk behaviors in sexual practices and also changing and exchange of partners and introduction of pornographic films into small towns, the wide use of abuse of substance, expansion of night clubs to urban centers and influx of rural community to urban areas.

A higher Sero-positivity in females found in this study compared to males i.e., nearly twice. This finding is twice lower than the figures of Gondar City street dwellers prevalence for females and males.[21] The study finding is similar to studies conducted in Malawi.22 The fact that it might associated with sexual violence and forced sex as well as higher exposure for peer group pressure more prone the females for sexual practice. This fact also supported by studies which reveals, higher prevalence among females is associated to their social and economic disadvantages.[3]

HIV Sero- positivity among age specific prevalence was higher in age group 24-29. The finding which are consistent with studies in Ethiopia.[5] These age groups show sexually most active ones leading to greater time of exposure to HIV infections. Sero-positivity among third year students was high and followed by in first year students. It is attributed to their stabilized and active interactions with their environments. They are more accustomed to express their feelings to develop relationships with friends and peer groups.

A 10% HIV prevalence by sexual behavior among study subjects who have ever had sexual intercourse. There is a pattern of higher HIV prevalence with onset of sex at ages of 9-14, 15-19 and 20-24 with respective prevalence of 12.5%, 11.1% and 6%. This can be explained by early initiation of sex leading to higher risk of HIV infection. It indicates the assumption that early sexual onset would risk with a longer average period of sexual activity. The fact that individuals initiating sex at very young age are more exposed to the infection.

This study reveal that , HIV risk gets higher directly with the number of sexual partners and Sero-positivity is significantly high in those who had more than three sexual partners compared to a single partner. The finding is analogous to the finding of other previous study.[24] The current study found that the risk of exposure to HIV infection increases with the pattern of use of condoms i.e. respondents in this study were use condom regularly, occasionally, most of the time. Condom use and HIV risk suggests that HIV rates were lower in regular condom users, and non-users were associated with higher Sero-positivity of HIV infection. This study finding supported by other studies, i.e. appropriate use of condom is one of effective ways of preventing the transmission of HIV.[25, 26]

This study discloses that Sero-prevalence among anal sex and Men who have sex with men (MSM) showed higher Sero-prevalence compared to vaginal and heterosexual practices. This can be explained by the change in sexual orientation to unprotected anal sexual practices, involvement in a number of sexual partners with frequent change and exchange of partner and being condom non-user.[27] According to the current study, highest prevalence who had experience of rape and history of STI in their life time.

Substances and drug user's shows high Sero prevalence of HIV 26.9% in shisha and 22.6% in hashish users. This shows there is an association with HIV Sero-prevalence and use of substance.

In this study, majority of the participants have knowledge about HIV transmission and prevention. However, their perception of risk behavior and practices still need to be changed. The relatively low prevalence in this study with 91.2% Sero-negativity indicates this fact. This can be well explained that over half of the study subjects had their HIV Sero-status been tested prior to this study.

5. Conclusion

This study demonstrates that HIV remains as a serious health problem to those who were positive as well as to those who practice risk behaviors and comparably, lower prevalence of HIV was noticed in the study, This study has shown the fact that HIV prevalence continues to be higher in urban areas and small towns, which is in line with the country (Ethiopia) prevalence by area of residence. Higher Sero-prevalence depicted among those who practiced unsafe sexual behaviors, risky habits of styles of life involving alcohol beverages drinking, chat chewing, substance use, drug abuse and which deeply rooted into their behaviors. Even though, the current study shows, high level of knowledge about the HIV transmission nevertheless, there is risk behaviors driven to Sero positivity.

New orientation of sexual behaviors such as men to men sex, change and exchange of several sex partners, rapes, revealed positive association with HIV Sero status. In conclusion, unprotected sexual relationship remains as a major cause of HIV infection. Hence, this study tries to found some variables which affect as positively and negatively the outcome of HIV Sero status therefore, there is a need to be further studies in depth for proper reduction of HIV infection among the late adolescence and adult community. As number of higher institution is rapidly expanded and tries to train many students, there is a need to expand their advocacy mechanism to change risk behavioral which lead to risk of HIV infection.

References

[1] UNAIDS/WHO.AIDS Epidemic update. Geneva, (2007).

[2] WHO. Towards universal access: scaling up priority HIV/AIDS interventions in the health sector: progress report. Geneva: (2008).

[3] Tefera,et al, (2004). HIV Sero-prevalence among students of Jimma University, south west Ethiopia. Ethiopian Journal of health sciences, Vol. 14, A.A.U. printing press; 2004.

[4] UNAIDS/WHO. Report on the global HIV/AIDS epidemic. Geneva, 2008.

[5] MOH and FHAPCO. Progress report on towards implementation of the UN Declaration of Commitment on HIV/AIDS: March 2010.

[6] Yemane B. et al, .HIV / AIDS in Ethiopia an epidemological synthesis:World Bank Global HIV/AIDS Program Washington, DC. (2008).

[7] MOH/National HIV/AIDS prevention and control office: AIDS in Ethiopia 6th report. Addis Ababa: 1998.

[8] MOH and FHAPCO. National Consensus Meeting on Single HIV Prevalence Estimation: Adama, Ethiopia, 11-12 May, 2007.

[9] FHAPCO. Report on Progress towards Implementation of the UN Declaration of Commitment on HIV/AIDS. Addis Ababa: Federal HIV/AIDS Prevention and Control Office, (2008).

[10] UNAIDS, 2006 Report on the Global AIDS Epidemic: Geneva, 2006.

[11] FHAPCO. The development of National Advocacy Guideline implementation manual for HIV Intervention in Ethiopia. Proceeding of Consultative Workshop (pp. 1-9). Addis Ababa: Ethiopian Public Health Association. 2004.

[12] CDC. Youth Risk Behavior Surveillance. MMWR; 53(SS-2):1–29; 2004.

[13] Fleming DT et al, W. J. Epidemiological synergy to public health policy and practice the contribution of other sexually transmitted diseases to sexual transmission of HIV infection. Sexually Transmitted Infections, 75:3–17; 1999.

[14] Leigh BC et al, S. R. Substance use and risky sexual behavior for exposure to HIV: issues in methodology, interpretation, and prevention. American Psychologist, 48:1035–1045; 1993.

[15] Diaz T, C. S. Socioeconomic differences among people with AIDS: results from a multistate surveillance project. American Journal of Preventive Medicine, 1994; 10:217–222; 1994.

[16] Dittus P, M. K. Why Parents Matter, the conceptual basis for a community-based HIV prevention program for the parents of African American youth. Journal of Child and Family Studies, 2004; 13(1):5–20; 2004.

[17] Yohannes A, M. A. The impact of HIV/AIDS information disseminated on the status of behavioral change brought among Jimma University students. Ethiop. J. Educ. & Sc, Vol. 2:2006.

[18] ISAPSO. Implementation of HIV/AIDS Prevention Program among Addis Ababa University students. Ethiop. J. Educ. & Sc., 2000.

[19] Gayle H, K. R., HIV Sero-prevalence on university campuses, 1989.

[20] Nwachukwu N, O. A. Sero prevalence of HIV among Some fresh Nigerian Graduates. Journal of Immunology, 20081(2)51-55, 2008.

[21] Moges et al. Sero-prevalence of HIV, hepatitis B infections and syphilis among street dwellers in Gondar city, Northwest Ethiopia. Ethiop. J. Health Dev. 20(3):160-165; 2006.

[22] Rubadiri D, L. D. HIV/AIDS policy. Malawi: University of Malawi.; 2003.

[23] MOH and FHAPCO. Report on HIV Prevalence level in Ethiopia; 2004.

[24] CSA, O. M. Ethiopia Demographic and Health Survey; Addis Ababa, Ethiopia and Calverton, Maryland, USA: Central Statistical Agency and ORC Macro: 2006.

[25] Yohannis A., Intention to use condom and remaining faithful in student at Gondar University student. 1-35; 2006.

[26] Zerai, K. Sexual experiences and their correlates among Jimma University students. Ethiopian Journal of Health Sciences ,Vol. 15, No. 1,1-15, A.A.U printing press; 2005.

[27] Seifu Hagos Gebreyesus, Damen H., M.; Assessment of HIV/AIDS related risks among men having sex with men (MSM) in Addis Ababa, Ethiopia: Journal of Public Health Policy V. 30, 269–279; 2009.

[28] SNNPR: The HIV/AIDS Epidemic in SNNPR Region: Estimates and projection on HIVE prevalence and incidence, technical report 106-112, 2005.