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SUBSTANCE USE AND SEXUAL RISK BEHAVIOR AND FACTORS ASSOCIATED WITH HIV TRANSMISSION IN SOUTHERN ETHIOPIA

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ABSTRACT

Keywords:

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Background: Evidences notify that most of higher learning students rush to range of maladaptive high-risk activities like, substance and sexual abuse which predispose to HIV. More often this is unrecognized and not well researched.

Objective: To determine magnitude of substance use and risky sexual behavior for HIV transmission among students in Hosanna Health Science College from December 1, 2010 to December 30, 2010.

Methods and Materials: Cross sectional study undertaken among statistically determined (n) =428 and randomly selected Students from all departments and years of study in Hossana Health Science College. Piloted and self-administered questionnaire were used to collect data. Summary measures like mean, chi-square and regression were utilized to quantify magnitude and identify independently associated factors.

Results: Majority 267 (63.1%) of study participants were female, and 379 (89.5%) in age group (17-24). From 423 participants, 330(78.0%) were, sexually experienced. Khat (27.7%) and Alcohol (21.7%) were the commonly used substances and having multiple sexual partners (47.6%), inconsistent condom use (20.0%) were common sexual risk behaviors for HIV transmission. Female [AOR=1.5], fresh students [OR=2.4] and alcohol users [OR=3.5] were more likely to engage in sexual risk practices.

Conclusions: Substance use and risky sexual practices were significantly higher among study participants. Practicing sex with multiple partners, inconsistent condom use and commencing sex with female commercial sex workers, which were highly risky sexual behaviors for HIV infection transmission among study participants, were commonly practiced among study participants.

INTRODUCTION: Recent statistical evidences on HIV/AIDS notify continuing reduction of prevalence and incidence of HIV in most of regions of the world, however; the overall rates of the infection remains higher in sub-Saharan African countries¹. Total of 22.5 (20.9-24.3) million people living with the virus in the region that account for 67.7% global infection and about 1.7 million new infections were reported in 2007, 68.0% of new infection of the world². Moreover,

United Nations Joint program on HIV/AIDS (UNAIDS) reported 2.6 million new infection in 2009, 1.8 million of these were reported to sub-Saharan Africa with average prevalence of 5.0%³.

Ethiopia share similar profile with sub-Saharan countries that hardly hit by HIV /AIDS epidemic and still the virus posing its deleterious effects despite preventive strategies implemented in Ethiopia⁴.

Ethiopian Ministry of Health (MOH) health profile 2010 report estimated about 1.1 million people living with HIV/AIDS in Ethiopia which is one of the largest proportion in the world, although the current prevalence 2.1% lower for most of sub-Saharan African countries⁵.

Available data on distribution of HIV/AIDS pandemic reveal majority of the new infections were reported for adult and young population⁶. Large proportion of youth 15-24 enrolled to higher risk sexual practices for HIV transmission, the magnitude reported for both sexes female 6%, male 37% higher than most at risk groups in Ethiopia⁷.

Data available on most at risk population for HIV transmission show; truckers, street children, daily laborers, refugees, students and other mobile population were recognized as vulnerable groups for HIV transmission^{5,8}. Initiate sexual intercourse at low age, having multiple sexual partners, and inconsistent condom use were the major risk behaviors identified for HIV transmission^{9,10}.

Substance and alcohol use were factors frequently associated with commencing risk sexual practices^{10,11}. Additionally Alcohol and substance use accounts for 5.4% of global disease burdens¹². Khat and Alcohol are the commonly used substances in Ethiopia¹³.

Colleges are institutions of higher learning provide education to undergraduates and award diplomas and degrees in specific academic fields. Students of higher learning institutions are people with multiple socio-cultural grounds begin autonomous life at younger age for first time. Study findings reveal most of students of higher education rush to range of maladaptive high-risk extracurricular activities like alcohol use, substance and sexual abuse¹⁴.

Data regarding Health Science Students is scarce in Ethiopia. This study therefore, aimed at assessing the magnitude of substance use, sexual risk behavior and factors associated among students in Hosanna Health Science College.

METHODS AND MATERIALS: Cross-sectional study design was utilized among students in Hosanna Health Science College, and statistically determined sample participants were drawn from total of 1867 regular

students of all departments of 2008-2010 academic years of study. Sample size (n=428) determined using single population proportion formula and proportionally allocated to departments and years of study (assuming p=50%, precision=0.05 and confidence level of 95%).

Variables deserve operational descriptions were defined for clarification

- 1) **Sexual experience:** Practiced penetrative penile vaginal sex at least once.
- 2) **Gross inconsistency:** Mistakes or unmatched responses to at least two questions in the questionnaire.
- 3) **Risk behavior:** Pattern of personality that predispose to conceive HIV infection.

Risky sexual behaviors such as, having multiple sexual partners, inconsistent condom use and commencing sex with commercial sex workers were taken from findings of Ethiopian Demographic and Health survey of 2005 were dependent variables. This study was intended to magnify the socio-demographic profile and substance use were factors known to independently affect higher risk of sexual behavior.

Semi-Structured, piloted and self administered questionnaire was designed based on the objective of the article and translated to local language " Amharic" version was used to collect data.

Data was entered to computer software, SPSS Version 16.0 and Epi-Info version 6.0 cleaned, analyzed and summarized in to tables. Associations were assessed using chi-square test and significance were further analyzed using regression with cut off points for p-value 0.05 & 95 % confidence interval for significance.

Ethical approval was assured by research ethics committee of Hosanna Health Science College, purpose was clarified for study subjects and identifiers were avoided to secure confidence. Finally questionnaire was distributed after informed consent and participants were asked to complete and drop in to box prepared.

RESULTS AND DISCUSSION:

Socio-Demographic profile: Total of 428 subjects were included in the study with response rate of 99.5% by including 423 valid responses in the analysis. Large proportion 267 (63.1%) were female, 165 (39%) in age group (17-24) with mean age 21.4 and 343 (81.1%) were not ever married. Majority of participants, 50.6% and 30.0% were protestant and Orthodox Christians respectively. About 41.4% freshman, 32.4% second and 26.2% third year students were included in analysis that suggests the sample is representative (**table 1**).

TABLE 1: SOCIO-DEMOGRAPHIC CHARACTERISTICS OF STUDENTS IN HOSANNA HEALTH SCIENCE COLLEGE, HOSANNA, SOUTHERN ETHIOPIA, DECEMBER 2010

Characteristics	Number	%
Sex		
Male	156	36.9
Female	267	63.1
Age group		
17-24	379	89.5
25-34	40	9.4
35-39	4	1.1
Department		
Clinical nursing	183	43.3
Midwifery	74	17.5
Public nurse	55	13
Medical laboratory	50	11.8
Environmental health	46	10.9
Health informatics	15	3.5
Religion		
Orthodox	128	30.3
Protestant	214	50.6
Muslim	81	19.1
Year of study		
First	175	41.4
Second	137	32.4
Third	111	26.2
Marital status		
Married	80	18.9
Single	343	81.1
Alcohol use		
Yes	92	21.7
No	331	78.3
Khat chewing behavior		
Yes	117	27.7
No	306	72.3
Ever practiced sex		
Yes	330	78.0
No	93	22.0
Total	423	100.0

Sexual Characteristics: Out of 423 students, 330 (78.0%), [119 (76.3% of male, 211(79.0%) female] were sexually experienced, more than half of (50.1%) of them were not ever married. Large proportion 79.2% of subjects in age group 25-34 were sexually experienced followed by 78.9% of 35-39 and 76.4% between 17-24 age groups. Few 9.0% of sexually experienced participants reported practicing sexual intercourse 2-3 times and most 85.0% reported 4-9 times in 30 days prior to the study, the rest 6.0% more than 10 times (**table 2**).

Substance use: Among 423 subjects, Khat "*Catha-edulis*" and alcohol were the commonly misused drugs in the study area during the study period. Total of 117(27.7%) reported chewing khat at least 2-3 times per week and 92(21.7%) reported history of alcohol use at least three times per month in the last 3 months before the study. The magnitude for current Khat use among the sample was 27.7%, higher than the one that was reported for Gondar College of medical Science (17.5%)¹⁵, but lower than Case-Control study report for Jimma 59.0%,¹⁶ and among staff of Jimma University 30.8%¹⁷. However; in contrast to reports, the association of Khat chewing and sexual risk behavior remains not significant statistically, although large percentage of Khat chewers engaged in these risky sexual practices for HIV transmission. The most likely explanation for these could be,

- 1) Majority of the participants use it for academic purpose and cannot afford the cost for alcohol to combat insomnia and unpleasant feelings following it,
- 2) Most use less frequently, commonly on weekly bases.

Furthermore; this study attempted to determine the prevalence of alcohol use and explore its association with risky sexual behavior. The prevalence of alcohol use was found to be 21.7%, that is invariably higher to Urban Governmental High schools in Addis Ababa & Butajira (17.9%)¹⁸ and lower than reported for Addis Ababa 45.0%¹⁹. Regression findings reveals that alcohol use was significantly associated with all forms of risky sexual behavior for HIV transmission, [OR=2.52] for multiple sexual partner, [OR=2.86] inconsistent condom use and [OR=12.1] sex with commercial sex workers, this finding is consistent with findings of other studies^{19, 20}.

TABLE 2: ASSOCIATION OF SELECTED VARIABLES WITH SEXUAL RISK BEHAVIOR FOR HIV TRANSMISSION AMONG SEXUALLY EXPERIENCED STUDENTS IN HOSANNA HEALTH SCIENCE COLLEGE, HOSANNA SOUTHERN ETHIOPIA, DECEMBER 2010.

Variables	Mu Multiple Sexual partner		AOR (95%CI)
	Yes n (%)	No n (%)	
Sex			
Male	48 (40.3)	71 (59.7)	0.63(0.40,0.99)*,P=0.04
Female	109 (51.7)	102 (48.3)	
Religion			
Orthodox	43(36.4)	75(63.6)	4.7(2.42,9.50)*,p=0.001
Protestant	70(46.1)	82(53.9)	3.2(1.6,6.20)*, p<0.001
Muslim	44(73.3)	16(26.7)	1
Department			
Clinical nurse	59(38.8)	93(61.2)	4.7(1.22,18.12)*p=0.024
Midwifery	20(43.5)	26(56.5)	3.8(0.9,16.2)
Public nurse	23(54.8)	19(45.2)	2.4(0.58,10.4)
Medical laboratory	19(50.0%)	19(50.0)	2.9(0.7,12.8)
Environmental Health	27(67.5)	13(32.5)	1.4(0.33,6.23)
HIT	9(75.0)	3(25.0)	1
Year of study			
First	57(36.3)	100(63.7)	2.4(1.4,4.07)*, p=0.001
Second	48(57.8)	35(42.2)	0.9(0.5,1.82)
Third	52(57.8)	38(42.2)	1
Take alcohol			
Yes	59(70.2)	25(29.8)	3.5(2.09,6.07)*, p=0.0001
No	98(39.8)	148(60.2)	
Lascivious video in mobile			
Yes	44(65.7)	23(34.3)	2.5(1.45,4.44)*, p=0.001
No	44(65.7)	23(34.3)	2.5(1.45,4.44)*, p=0.001
Marital status			
Married	27(33.8)	53(66.2)	1
Single	130(52.0)	120(48.0)	2.1(1.25,3.59)*, p=0.005

* Statistically significant associations

Multiple Sexual Partners: Total of 157 (47.6%) of sexually experienced subjects reported more than two sexual partners in last 3 months before the study. Regression analysis findings reveals that male subjects were less likely to report multiple sexual partners compared to female [OR=0.63, CI (0.40, 0.99), P=0.04].

Religion, Department and year of study were significantly associated with multiple sexual partners. The likelihood of reporting multiple sexual partners was higher among Orthodox Christians [AOR=4.7, P<0.001] followed by, protestant Christian students [AOR=3.2, CI, (1.6, 6.20) P=0.002] compared to Muslim counterparts.

More over; subjects from clinical nursing departments were significantly higher to report multiple sexual partners compared to health informatics department [AOR=4.7, CI, (1.22, 18.12), P=0.024]. Freshman students were more than two times likely to report multiple sexual partners compared to third year students [AOR=2.4, CI, (1.4, 4.0), P=0.001 and the odds

of reporting multiple sexual partners was more than twice among alcohol users [AOR=3.51, CI, (2.09, 6.07), P=0.001] and nearly twice higher among participants having videos or figures initiating sexual desire in mobile phones compared to those not use [AOR=2.5, CI, (1.45, 4.44), P=0.001].

The magnitude of practicing sex with multiple partners in this study (47.6%) was incomparably higher than reports for similar subjects in different settings, 44.1%²¹ and 34.5% for school adolescents in Nekemte²².

Majority of reasons reported were to get academic and financial support. Bivariate and Multivariate analysis findings notify, female, freshman students, Christian [Orthodox & protestant], Clinical Nursing students, single [Not ever married, Divorced, Widowed], Students having videos initiating sexual need, and Alcohol users were more likely to engage in having multiple sexual partners. Recent data for these variables is not available for comparison.

Condom use: Condom use assessed and recorded in the manner that participants or their partners use condom always with all except marital partner "consistent condom use" and those never use or use sometimes and rarely as "inconsistent condom use". The association between condom use and selected variables given in **table 3** below. About 20.0% of sexually experienced participants or their partner used condom inconsistently in the last 30 days before the survey. Regression analysis findings reveal significant difference in condom use among demographic and behavioral patterns of sample subjects. Orthodox Christians were about seven times more likely to use

condom inconsistently compared to Muslims [OR=7.3, CI, (2.15, 25.14) P<0.0001]. Adjusted analysis findings notify freshman students of the college were more likely to use condom inconsistently during the study period [AOR=3.7, P<0.001] compared to third year students. Alcohol use was significantly associated with inconsistent condom use that participants use alcohol were more than two times risky to use condom inconsistently [AOR=2.86, CI, (1.63, 5.02) P<0.0001] and subjects having videos initiating sexual desire in mobile phone were more likely to report inconsistent condom use in the most recent sexual intercourse [OR=2.15, P=0.015].

TABLE 3: ASSOCIATION OF SELECTED VARIABLES AND INCONSISTENT CONDOM USE AMONG SEXUALLY EXPERIENCED STUDENTS IN HOSANNA HEALTH SCIENCE COLLEGE, HOSANNA SOUTHERN ETHIOPIA, DECEMBER 2010

Variables	Inconsistent Condom use		AOR (95%CI)
	Yes n (%)	No n (%)	
Sex			
Male	25 (21.0)	94 (79.9)	1
Female	41 (19.4)	170 (80.6)	0.9(0.50,1.58),P=0.07
Religion			
Orthodox	33(28.8)	85(72.0)	7.3(2.15,25.14)*, p=0.001
Protestant	30(19.7)	122(80.3)	1.5(0.89,2.78)
Muslim	3(5.0)	57(95.0)	1
Year of study			
First	42(26.8)	115(73.2)	3.7(1.6,8.3)*,p=0.001
Second	16(19.3)	67(80.7)	1.5(0.70,2.92),p=0.200
Third	8(8.9)	82(91.2)	1
Take alcohol			
Yes	26(31.0)	58(69)	2.8(1.65,5.02)*p=0.0001
No	40(16.3)	206(83.7)	1
Lascivious video in mobile			
Yes	18(26.9)	49(73.1)	2.15(1.16,3.95)*,p=0.013
No	48(18.3)	215(81.7)	1

* Statistically significant associations

The percentage of inconsistent condom use in this study was 20.0%, that confirm 80.0% of participants or their partners use condom consistently, which is higher than reported for Kombolcha (34.9%)²³ and lower than reported for paid sex in (94.0%) Kenya²⁴. The difference in sex, age group, and marital status was not significant in condom use, however; it was significantly affected by Alcohol use, which is supported by previous report²⁵. Freshman students and Orthodox Christian students were more likely to use condom inconsistently. The reasons why these groups engage in risky behaviors deserve further research.

Sex with Female Commercial Sex Workers: Commencing sexual intercourse with female commercial sex workers in Bars and "Brothel" [Areke and Tela Bet] in local language is one of risky sexual behavior for HIV transmission that this study intended to explore.

Out of 119 sexually experienced male participants 19(15.9%) reported practicing sex with female commercial sex workers. This finding was higher than reported for Nigeria (3.3%)²⁶ and Alcohol users were more likely to visit commercial sex workers, supported by reported for Addis Ababa²⁶.

Participants who reported taking alcohol had greater odds [OR=12.1, P<0.0001] of practicing sex with female commercial sex workers in the last three months before the study. Multivariate analysis show married male subjects were more likely to commence sex with female commercial sex workers compared to their single counterparts [AOR=2.66, P=0.04].

CONCLUSION: The magnitude of substance use and higher risk sexual behavior for HIV transmission is high among students. Khat and Alcohol were commonly used substances by study participants. Practicing sex with multiple partners, inconsistent condom use and commencing sex with female commercial sex workers in Bars and Brothels were common highly risky sexual behaviors for HIV infection transmission among study participants.

Female, Christian students, Single, clinical Nursing departments and fresh (First year) students were more risk groups to enroll into risky sexual behavior [to have multiple sexual partners, inconsistent use and sex with commercial sex workers]. Habits of taking alcohol and having lascivious figures/videos in personal mobile phones, were factors associated with all forms of risky sexual behavior for HIV transmission.

Training on highly risky sexual behavior for HIV transmission for students with special emphasis to higher risk groups identified and establishing information center and equipping students with up-to-date HIV related information for ease access for students in Amharic versions.

Preparing regular HIV talk show programs in the Colleges with students, instructors and college management on periodical bases and adjust continuous discussion at least once in a month on the topic "what makes them worry" regarding factors for higher risk sexual behavior with special attention to female students .

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REFERENCES:

1. United Nations joint program on HIV/AIDS (UNAIDS) Outlook Report 2010; available at: <http://www.unaids.org/outlookreport> : accessed on 20/07/2011
2. UNAIDS (2007) AIDS Epidemic update, Global summary of AIDS epidemic: http://unaids.org/pub/epislides/2007/2007_epiupdate_en.pdf : accessed on November 30/2010
3. UNAIDS (2010) Report on Global AIDS epidemic; available at: http://www.unaids.org/globalreport/global_report : accessed on March 20/2011
4. Federal Ministry of Health National HIV/AIDS prevention and control office, Ethiopia, AIDS in Ethiopia sixth Report September 2006.
5. Federal Democratic Republic of Ethiopia ,Federal HIV/AIDS prevention and control office :Report on progress towards implementation of UN Declaration of commitment on HIV/AIDS, March 2010
6. Overview of HIV interventions for young people: <http://www.unfa.org/hiv/iatt/docs/overview.pdf> . accessed on March 20/2010
7. Central statistical Agency Ethiopia, ORC, Macro, USA. Ethiopia Demographic and Health survey 2005.Addis Ababa 2006
8. James Olusegun B.,Olugbemigia Lanre A., Wasiu Olalekan A.; Sexual behavior and risk of HIV/AIDS among adolescents in public secondary schools in Osogbo,Osun state ,Nigeria: International Journal of Adolescent Medicine and Health (2009);21(2):387-394
9. Jenifer L., Peter A.; Alcohol use, partner type, and risky sexual behavior among college students: Findings from an event –level study, 2007: addictive Behaviors Volume 32, (12), PP 2940-2952.
10. Fekadu M., Alemayehu W.: Age at sexual initiation and factors associated with it among youth in North east Ethiopia; Ethiopian Journal of Health Development(2009);23(2);154-162
11. Alice F.Yu-wen C., Carolyn A., Min Q.:STD_/HIV-Related sexual risk behavior and substance use among U.S Rural Adolescents: Journal of the National Medical Association (2007); 99(12) PP 1386-1394.
12. World Health Organization (WHO),Atlas 2010:First global report on substance use disorders launched; available: http://www.who.int/entity/substance_abuse/publications/en accessed on March 7/2011
13. Abebaw F.; Atalay A., Charlotte H.; Alcohol and Drug Abuse in Ethiopia: Past, Present and Future :African Journal of Drug &Alcohol studies(2007) ,6(1), 39-53
14. Olayinka O.,A., Kofo O., Odusote., Mopelola O.,Om,Victoria O., Ayoade A., Kehinde O.: Determinants of young people's sexual behavior concerning HIV and AIDS in the practice population of a University Health center in Lagos, Nigeria; African Journal of primary Health care & family medicine (2011): 3(1)
15. Yigzaw K.; Cigarette smoking and Khat chewing among college students in North West Ethiopia: Ethiopian Journal of Health Development (2002); 16(1); 9-17
16. Dawit A. ,Asfaw D.,Amare D.,et.al ; Khat chewing habit as possible risk behavior for HIV infection :Ethiopian Journal of Health Development(2005);19(3);174-181
17. Yeshigeta G., Abraham H.; Khat chewing and its socio-demographic correlates among the staff of Jimma University :Ethiopian Journal of Health Development(2004);18(2);179-184

18. Mesfin K., Hassen T., Ghimja F., Teshome T.: Drug use among high school students in Addis Ababa and Butajira: Ethiopian Journal of Health Development (1999);13(2);101-106
19. Assefa S., Damen H., Alemayehu W., : The association between substance abuse and HIV infection among people visiting HIV counseling and testing centers in Addis Ababa, Ethiopia : Ethiopian Journal Health Development (2005) :19(2) 116-125
20. Juan A., Suzanne D., Phabiola M., Robert H., and Valerie P.; Sexual behavior and drug consumption among young adults in a shantytown in Lima, Peru: BMC public Health 2009, 9:23 available from <http://www.biomedcentral.com/1471-2458/9/23> accessed 5/6/2010 [pub med].
21. Vanphom S., Sara T., Elisabeth F.; Concurrent multiple health risk behaviors among adolescents in Luangnamtha province, Lao PDR: BMC public health 2011,11:36 available from: <http://www.biomedcentral.com/1471-2458/11/36> accessed on 11/7/2011
22. Assefa S.; Desalegn W.; Premarital sexual practice among school adolescents in Nekemt town, East Wollega; Ethiopian Journal of Health Development (2008);22(2);167-1173.
23. Endrias B.,; Assessment of risky sexual behavior for HIV/AIDS among Male daily laborers in Kombolcha Town, North east Ethiopia: Ethiopian Public Health Association ,Master's thesis (2008) Extract (4), 67-79
24. S.P.Tegang, S.Abdallah, G.Emukule, et al.: Concurrent sexual and substance –use risk behaviors among female sex workers in Kenya's cost province: Findings from a behavioral monitoring survey :Journal of Social Aspects of HIV/AIDS (2010),7(4), 10-15
25. Adedeji S A., Titilayo C A., and Joseph A B., Mainza L.: HIV sexual risk behaviors and perception of risk among college Students: implications for planning interventions: BMC public Health (2009), 9:281: Available at <http://www.biomedcentral.com /1471-2458/9/281> accessed on March 20/2010. [Pub med].
26. Adenike I O., Wasiu O A., Olugbeba L A.: Sexual Risk behavior among in-school Adolescents in public secondary schools in a southwestern city in Nigeria: International Journal of Health Research (2009);2(3):243-25; Available at <http://www.ijhr.org,> 5/7/2010
27. Nigatu R., Seman K., Attitude and practices on HIV preventions among students of higher education institutions in Ethiopia :The case of Addis Ababa University ;Educational Research (2011), (ISSN:2141-5161) Vol.2(2) pp.828-840: Available from; <http://www.interestjournals.org/ER> accessed on March 23/2011.
