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Predictors of consistent condom use among University students: Hierarchical analysis Debre Berhan, Ethiopia
Muluken Dessalegn*, Maereg Wagnew**

*Lecturer at School of Health Science, Department of Public Health, **School of Health Science, Department of Public Health

ABSTRACT

Back ground: HIV/AIDS, STI, and unwanted pregnancies are prevalent in higher institutions. To minimize this triple burden, an effective strategy is consistent condom use. Purpose: To assess determinant factors for consistent condom use among university students. Methods: A cross-sectional study design was conducted in March, 2012. A two-stage, stratified sampling method was employed for the selection of 576 study subjects. Hierarchical logistic regression was employed to identify determinate factors. Result: The findings showed 36.5% of students were sexually active. Of these, 53.4% reportedly used condoms during sexual intercourse and 55.6% of them reportedly used condoms irregularly. The multivariate logistic regression showed that sex/gender, students' family residence, drinking alcohol, multiple sexual partners and khat chewing had an association on the intent of consistent condom use. Conclusion: Though there is an increase in the use of consistent condom use, large numbers of students are still at risk for acquiring HIV. Sex, drinking alcohol, chewing khat, families' place of residence, and number of sexual partners are predictors of consistent condom use.

Key words: University students, HIV/AIDS, consistent condom use, sexually active, Hierarchical logistic regression

Corresponding Author: Muluken Dessalegn, Debre Berhan University, P.O.BOX -445, Debre Berhan, Ethiopia
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Introduction

At the end of 2010, an estimated 34 million people were infected with HIV globally, including 3.4 million children less than 15 years old. In sub-Saharan Africa alone, an estimated 22.5 million people were infected with HIV/AIDS. In this region, Ethiopia is among the countries highly affected by HIV[1]. Adult HIV prevalence in 2010 was estimated to be 2.4% (1.9% for male and 2.9% for female). According to the same estimate, the rural and urban prevalence was 0.9% and 7.7%, respectively, and there were 1.2 million people living with HIV in Ethiopia in 2010. In addition, other sexually transmitted infections (STIs) have increasingly been recognized among youths in Ethiopia[2].

HIV/AIDS affects the basic education sector in various ways, which is vital to the creation of human capital. HIV/AIDS has become one of the major obstacles to achieving education for all by the target date of 2015[3]. The Ethiopian Ministry of Education has developed strategy and research documents further arguing this point[4].

Studies have shown that condoms can prevent the transmission of HIV and other STIs [5, 6]. A review of

multiple studies revealed that consistent condom use during sexual intercourse reduced HIV incidence by 80%[[7, 8]. Hence, condom use should be a strong focus in the ongoing battle to control the rising prevalence of HIV and STIs.

In Ethiopia, condom use is one of the main control strategies in the prevention of HIV/STIs [8]. However, based on recent reports, the rates of HIV/AIDS and other STIs continue to increase especially in higher education institutions in Ethiopia[9]. This suggests that individuals are still engaging in risky sexual behaviour and more work needs to be done to explore factors that influence condom use among this population.

Globally studies indicate the cause of inconsistent condom use depends on the interaction of behavioral, socioeconomic/demographic, and environmental factors [10, 11]. To understand causes of inconsistent condom use, one has to examine the relationships and interactions among the aforementioned factors. Therefore; the aim of this study is to explore predictors of consistent condom use among Ethiopian university students.

Methods

Study design, area, and population: A cross-sectional

study design was conducted at Debre Berhan University in March, 2012. The Debre Berhan University (DBU) cornerstone was laid on May 27, 2004. In its first year of operation, 2007, DBU taught 725 students within six departments. As of 2012, DBU has a population of 7,550 regular students in thirty educational departments.

Sample size and sampling procedure: A single population proportion sample size determination formula was used with the following assumption; the prevalence of condom use in Haremaya University, Ethiopia 55.6 % [12], margin of error of 5%, non response rate 5%, the desired level of confidence interval 95%, and design effect of 1.5, accounted for multi-stage sampling. Two-stage stratified sampling was employed for the selection of 576 students who served as the sample for this study. In the first stage, the university was stratified into health science, natural science, and social science. In the second stage, students were stratified by their duration of stay at the university assuming that experience in the university setting would create a difference among study units. Therefore, the sample was divided into batches of 1st, 2nd, 3rd, and 4th year students.

Data collection methods: Anonymous, structured questionnaires were adapted from a standard Ethiopian Demographic and Health Survey (EDHS) [13] and from a Behavioral Surveillance Survey (BSS) [14]. The self-administered questionnaires were randomly distributed eight departments to students at the end of teaching class. The respondents were informed of the purpose of the study and were assured their responses would remain anonymous. Once the students finished the surveys, they were asked to deposit them in a designated box, to help assure their anonymity.

Variables

Outcome variable: Consistent condom use (use of a condom during every sexual intercourse)

Explanatory variables: Sociodemographic status (age, sex, ethnicity, religion, marital status), Socioeconomic status (level of education, family condition), Behavioral factors (multiple sexual partners, substance use, peer pressure, knowledge about condom use, contact with commercial sex workers, etc.)

Data management: Data was entered and cleaned in EPI INFO software and analyzed using SPSS 18 Both descriptive and analytical statistical procedures were employed. A hierarchical logistic regression technique was used to assess the relative effect of the explanatory factors on consistent condom use. To avoid an excessive number of variables and unstable estimates, only variables reaching a p-value less than 0.3 were retained for the subsequent analyses [15]. Three nested logistic models were used. Model 1 examines the joint effects of sociodemographic characteristics. Model 2

includes variables that had a p-value < 0.3 in Model 1 and the personal behavior factors. Model 3 builds on variables with p-value < 0.3 in Model 2 and includes the knowledge and attitude factors.

Ethical clearance was obtained from Debre Berhan University ethical clearance committee.

Result

Socio-demographic characteristics: A total of 576 study participants were included with the response rate of 565 (98.1%). Mean age of students was 21.079 ± 1.43 SD. Three-hundred-seventy-four (66.2%) and 286 (50.6%) students reported going to church/mosque each day, or 4 to 7 days a week, respectively. The average monthly income of students was 256.7 birr. Table 1 below shows the detailed socio-demographic characteristics of all survey respondents (table 1).

Knowledge about HIV/AIDS and STI transmission Four-hundred-eighty-three (85.5%) students believed healthy looking students can spread HIV, and 424 (75%) students believed using condoms during sex prevented the spread of HIV/AIDS. Students also believed that unprotected sex (519 students, or 91.9%), sharing a tooth brush (344 students, or 60.9%), blood exposure (409 students, or 72.4%), and deep kissing (127 students, or 22.5%) were means of HIV transmission. Insect bites (6 students, or 1.1%) and sharing food (4 students, or 0.7%) were also mentioned as suspected modes of transmission.

Of the participants, 514 (91%) knew about STIs and 97.7% believe they are transmitted through sex. Based on self reporting, 158 (28%) had experienced signs and symptoms of STIs. Of these students, 103 (18.2%) were treated for such signs and symptoms.

Attitude of students toward condoms: Three-hundred-ten students (54.9%) were not comfortable, 117 students (20.7%) were moderately comfortable, and 138 students (24.4%) were comfortable to buy condoms from shops. Likewise, 214 respondents (37.9%) were not comfortable, 161 respondents (28.5%) were moderately comfortable, and 190 respondents (33.7%) were comfortable to get free condoms from the DBU AIDS Resource Centre. Meanwhile, 278 (49.2%), 104 (18.4%), and 183 (32.4%) students were not confident, moderately confident, and confident to carry condoms in their school bag or purse, respectively. In addition, only 222 students (39.9%) had confidence in the quality of free condoms.

Three-hundred-thirty-three respondents (59.5%) believed condoms prevent pregnancy and 329 (58.2%) were confident that condoms protected them from HIV/AIDS and others STIs. Three-hundred-ninety-eight students (70.4%) reported being tested on average 2.678 ± 2.3 times for HIV.

Table 1: socio-demographic characteristics of DBU students March, 2012

Variable (n=565)		Frequency	Percent (%)
Sex	Male	352	62.3
	Female	213	37.7
Ethnicity	Amhara	398	70.4
	Oromo	57	10.1
	Tigrey	66	11.7
Religion	Orthodox	481	85.1
	Muslim	45	8.0
	Protestant	37	6.5
	Catholic	2	0.4
Visiting church/mosques once in a day	Yes	374	66.2
	No	191	33.8
Academic year	1st year	149	26.4
	2nd year	294	52.0
	3rd year	112	19.8
	4th year	10	1.8
Residence of their family	Rural village	270	47.8
	Small town	149	26.4
	Large town	59	10.4
	City	87	15.4
Residence of the student	in campus dormitory	541	95.8
	outside the campus	24	4.2
Monthly income	0 -100 birr	87	15.4
	101-200 birr	180	31.9
	201-300 birr	109	19.3
	301-500 birr	83	14.7
	>500 birr	37	6.5

Sexual experience and condom use: Two-hundred-six students (36.5%) reported having had sexual intercourse; with the mean ages of their first encounter were 18.3 ± 2.3 , with overall ages ranging from 11 to 29. Among sexually active students, 117 (56.8%) and 78 (37.9%) reported these relations were with irregular and regular partners, respectively, and 30 students (14.6%) had visited commercial sex workers. Also, among the sexually active students, 110 (53.4%) had reported using condom. Among these, 50 (45.5%) used condoms consistently.

Pornography, drinking alcohol, chewing khat, and condom use: As table 2 presents, 59.5% students reported watching a pornographic/sex film twice on average per month. One-hundred-seventy-four students (30.8%) reported drinking alcohol, on average twice a month.

As in Table 2, 19.5% of students reported chewing khat and after chewing, 38.2% had sexual intercourse, with

Table 2: Sexual and substance among surveyed DBU students, 2012

Variables(n=565)	Response	Frequency	Percent
Watching sex film	Yes	336	59.5%
	No	229	40.5%
Reason for watching sex film	Peer pressure	129	38.4%
	To get experience	168	50.0%
	No body to control this	39	11.6%
Sex after watching sex film	Yes	98	29.2%
	No	238	70.8%
Condom use during sex after pornographic	Yes	44	41.9%
	No	61	58.1%
Peer pressure to engage to sex	Yes	251	44.4%
	No	314	55.6%
Sex after drinking alcohol	Yes	78	13.8%
	No	487	86.2%
Condom use during sex after drinking alcohol	Yes	37	47.4%
	No	41	52.6%
Chew khat	Yes	110	19.5%
	No	455	80.5%
Sex after chewing khat	Yes	42	38.2%
	No	68	61.8%
Condom during sex after chewing	Yes	20	47.6%
	No	22	52.4%
Spent out of dormitory (Night)	Yes	111	19.6%
	No	454	80.4%
Enough money for school	Yes	310	54.9%
	No	255	45.1%
Sex for money or material support	Yes	35	6.2%
	No	530	93.8%
Condom use during money sex	Yes	13	37.1%
	No	22	62.9%
Participating social event	Sport club	135	23.9%
	social club	98	17.3%
	Religious club	258	45.7%
	Anti AIDS club	126	22.3%

52.4% not using condoms during sex. Among study

participants, 310 (54.9%) considered they got enough money for school purpose and only 35 (6.2%) had transactional sex. From these students, 22 (62.9%) did not use condoms during sex.

Associated factors for consistent condom use, bivariate results: Based on the bivariate analysis, family residence, age, having multiple sexual partners, having been tested for HIV, knowledge about HIV, being comfortable to use condom visiting commercial sex workers, peer pressure, alcohol consumption, chewing khat, and symptoms of STI had an association with consistent condom use.

Students whose families were living in small towns and rural areas were revealed to use condoms less consistently than students whose families were living in a city. Students who had been previously tested for HIV also showed a positive association with consistent condom use.

Multivariate analysis: According to the multivariate hierarchical logistic regression analysis depicted on

Table 3, in the condensed model (model-3), the factors that affect consistent condom use include sex of students, where their family lives, peer pressure, alcohol use, khat use, and having multiple partners.

As Table 3 presents below, females are more likely to use condoms inconsistently as compared to males [OR: 0.35, 95%CL, (0.154, 0.824)], and those who drink alcohol and chew khat are more likely to use condoms inconsistently [OR: 95% CI, 0.524 (0.249, .805) [OR: 0.408, 95% CI, (0.192, 0.867)] as compared with their counterparts respectively. Similarly, multiple sexual partners and those whose families lived in small towns and rural areas had significant association to use condoms inconsistently.

According to this study, among sexually active students who did not use condoms, the most frequently reported reasons (for low condom use) were being in a permanent relation (38.9%), disliking using condoms (15.34%), and feeling that condoms decrease sexual satisfaction (14%).

Table 3 Summary of the hierarchical logistic regression analysis of different factors on consistent condom use of DBU students in Debre Berhan, Ethiopia March, 2012

Variables	AOR (95% C.I)		
	Model 1	Model 2	Model 3
Sex(Male/Female*)	0.239(0.113,0.505)***	0.372(0.161,0.8600)	0.356(.154, .824)**
Family residence (Rural village/City*)	0.662(0.264, 1.659)	0.329(0.113, 0.962)	0.267(0.093,0.763)**
Family residence (Small town/ City*)	0.364(0.137, 0.968)**	0.177(0.057, 0.553)	0.232(0.079,0.679)**
Family residence (Large town/ City*)	0.496(0.161, 1.531)	0.329(0.087, 1.241)	0.379(0.106, 1.359)
Age	1.066(.837, 1.356)	—	—
Peer pressure (Yes/No*)	—	0.522(0.257, 1.060)	0.726(0.357, 1.478)
Drinking alcohol(No/Yes *)	—	0.508(0.236, 1.094)	0.524(0.249, .805)**
Multiple sexual partner(No/Yes *)	—	0.415(0.175, 0.985)**	0.568(0.255,.926)**
Sex for money(Yes/No*)	—	1.219(0.412, 3.604)	—
Sex with CSW(Yes/No*)	—	1.229(0.372, 4.059)	—
sex between student (No effect*)	—	0.613(0.209, 1.798)	—
sex between student (Medium effect/Very effect*)	—	1.543(0.583 4.083)	—
Khat chewing(No/Yes *)	—	0.468(0.199, 1.099)	0.408(0.192,0.867)**
buying condom from shop(No confidence/confident*)	—	—	0.713(0.339, 1.497)
buying condom from shop(Moderately confident/confident*)	—	—	0.595(0.231, 1.536)
Healthy looking transmit HIV(Yes/No*)	—	—	0.402(0.155, 1.041)
Condom can prevent HIV transmission (Yes/No*)	—	—	1.451(0.574, 3.671)
Tested for HIV(Yes/No*)	—	—	1.495(0.651,3.434)
Convincing partner (Very uncomfortable/Very comfortable*)	—	—	2.525(0.821,7.765)
Convincing sexual partner (uncomfortable)	—	—	2.145(0.640,7.194)
Convincing sexual partner (Indifferent)	—	—	1.137(0.375,3.446)
Convincing partner (Comfortable/ Very comfortable*)	—	—	595(0.207,1.715)
Sex for money(Yes/No*)	—	—	1.408(0.507,3.909)

Only variables reached p-value less than 0.3 were kept in the subsequent analyses, and displayed in the table.* Reference group, ** Significant at $p < 0.05$, *** at $p < 0.001$.

Discussion

Studies in Ethiopia and elsewhere indicate that condom use is an effective strategy for the prevention of heterosexual transmission of STIs. When used correctly and consistently, condoms can reduce the rate of HIV transmission by 87% [16, 17].

In this study, condom use rate among sexually active students was 53.4%, which is consistent with studies done at other Ethiopian locales, including Haremaye University (55.6%), among Addis Ababa youth (16-48%), and among young adults in Dessie (56.8%) [12, 14, 18-20].

Consistent condom use in this study was practiced by 45.5% of those surveyed, while 55.5% of students reported using condoms irregularly. This irregular use puts most students at high risk for acquiring HIV/AIDS, other STIs, and unwanted pregnancies [19, 20].

Gender: Both univariable and multivariable analyses showed sex acts as a predictor of intent to use condoms consistently, which is consistent with previous published findings [21].

Female students were disadvantaged on the intent to use condoms consistently. Male students reported using condoms 65% more often than female students. This might be due to females' inability and lack of empowerment to negotiate condom use due to socio-economic conditions (example culture) of the sexual encounter and gender/cultural norms in Ethiopia [22]. Peer pressure, which is explained later, also results in diminished participation of females in decision making regarding common use, as compared to male students, again due to Ethiopia gender and cultural norms.

Alcohol use: Findings of this study indicate that drinking alcohol has a statistically significant effect on consistent condom use. Students who drink alcohol are less likely to use condoms consistently than those who do not drink alcohol. This is consistent with the results of the 2005 Ethiopian HIV/AIDS Behavioral Surveillance Study [14]. Other studies also depict a significant association between excess alcohol consumption and lifetime tendencies toward high-risk sexual behaviors [23, 24]. There may be many reasons for this association. Alcohol can act directly on the brain to reduce inhibitions and diminish risk perception and hence produce a tendency towards high-risk sexual behavior. Therefore, students who drink alcohol may be rendered unconscious or unable to control themselves, resulting in unsafe sex and increased exposure to HIV/AIDS and STIs.

Khat chewing: In this study, chewing khat was found to be a significant predictor for inconsistent condom use. Sixty percent of respondents who were not chewing khat were more likely to use condoms consistently than

khat chewers. The frequency of khat chewing among youth Ethiopians was 19.5%, which is consistent with a study done in Saudi Arabia (19.2%) [25, 26].

Several studies revealed also that it is during the secondary school and the college age (15–25 years) that khat use is associated with risky behaviors. This could be attributed to biological, psychological, socio-cultural and economic factors [24].

Number of Sexual partner: In this study, the number of sexual partners was found to be significantly associated with consistent condom use. Students who reported having multiple sexual partners were less likely to use condoms consistently than those who reported not having multiple partners. Some studies suggest there is greater condom use among individuals with multiple partners [27, 28], but it is important to note that some investigations have reported increased condom use among those with non-regular sexual partners as compared to regular partners. This is to say condom use among individuals with multiple partners may increase if partners are irregular, and decrease if the individual is having sex with the same, multiple partners.

Place of residence: In this study, location of students' families' residence had a significant association with consistent condom use. The students whose families lived in rural villages and small towns were less likely to use condoms consistently than students whose families lived in large towns and cities. This finding might be due to low awareness about condom use in more rural areas, compared to those closer to urban or peri-urban centers where access to such information and materials might be more consistent.

Conclusion

As a conclusion of this study many students are sexually active and practiced unsafe sexes which are highly risky for HIV/AIDS, STI and unwanted pregnancy. The predictors of intent to use condom consistently are sex, students' family residence, drinking alcohol, multiple sexual partner and khat chewing.

Recommendation: The Universities shall give more emphasis on the students who come from small town and rural part of the countries regarding to HIV/AIDS and STI programs. Special attention has to be given to female students and the Universities have to work in collaboration with the municipality for the establishment of entrepreneurs of alcohol drinking, pornographic houses and khat around the University.

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