Risky HIV sexual behavior and utilization of voluntary counseling and HIV testing and associated factors among undergraduate students in Addis Ababa, Ethiopia

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Abstract

Background: HIV/AIDS is a major public health problem in Ethiopia. University students are often a young and sexually active group that is at risk of acquiring and transmitting HIV. We assessed risky HIV sexual behaviors and utilization of voluntary counseling and testing services among undergraduate students at Addis Ababa Science and Technology University, Ethiopia.

Methods: A cross-sectional study was conducted between May and June, 2013. Standardized semi-structured self-administered questionnaire was used to collect data. Simple random sampling technique was used to select departments from each school. All students in the selected departments were the study participants. Data were entered into EPI-Info and analyzed using SPSS statistical packages. P-value < 0.05 was considered as statistically significant.

Results: Of the total 602 students selected, an overall response rate of 557 (92.6%) were registered. Among the participants 361 (60%) were males. The student ages’ were ranged from 17 up to 25 years with mean age of 20.3 ± 1.6. Around 385 (64%) of them were in the age group of 17 up to 20 years. Among the study participants, 161 (26.8%) had sexual contact and the mean age of first sexual encounter was 17.4 (SD =2.3) years. About 443 (76%) of students knew that condoms can prevent Sexually Transmitted Infections (STIs). Among sexually active students, 74 (46%) had not used condom during first time sex. Among those responded, 488 (83.4%) had heard information about VCT; however, 52% had not ever used VCT service. The overall mean score of knowledge and attitude of students towards risk perception on HIV was around 66% and 57%, respectively. Students who enrolled in health science departments had almost three time more knowledge [AOR(95%CI) = 2.83 (1.67, 4.80)] and two and half times more favorable [AOR (95% CI) = 2.55 (1.60, 4.06)] attitudes towards HIV risk reduction strategies than students in non-health related departments.

Conclusions: Some students were engaged in risky sexual behaviour even though they had heard about HIV/AIDS. The perception of risk for acquisition of HIV infection and utilization of VCT were low. HIV prevention and control strategies including education in the areas of HIV/AIDS as part of university programs curriculum, specially non-health students, and strengthening health institutions to provide youth-friendly VCT services for HIV with “know your HIV status” campaigns are strongly recommended.

Keywords: HIV, VCT use, Risky sexual behavior, Addis Ababa, Ethiopia, University students

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Background

Since 2000, around 38.1 million people have become infected with HIV and 25.3 million people have died of AIDS-related illnesses [1]. In addition to improved access to antiretroviral treatment and care in many regions of the world, AIDS epidemic claimed 1.2 million lives in 2014 alone and mainly occur in sub-Saharan Africa that account 66.6% of all people living with HIV [1]. Young people are particularly vulnerable to both acquiring and transmitting HIV and more than 50% of all new infections worldwide are among young people between the ages of 15 and 24 [2].

In sub-Saharan Africa, the majority of HIV transmission occurs through heterosexual intercourse, mother-to-child transmission and unsafe blood transfusion [1]. Additionally, in the absence of an effective vaccine and cure, voluntary counseling and testing has been used as an entry point, a gateway to various prevention and care interventions including antiretroviral treatment.

A study that was done in Uganda on sexual knowledge, attitudes and behavior among urban youth in 2003 revealed that about 43% of Ugandan young people have had sex by the age of 15 and nearly 70% of sexual activity among young people is unprotected [3]. Moreover, over 33% of boys and young men had slept with two or more partners in the previous three months and the majority had little or no knowledge on preventing HIV. Thirty five percent of those who knew that condom were protective used one the last time they had sex compared with 19% of those who hadn’t know. Over 33% of respondents did not know where to buy condoms. And 74% of youth knew that people who look healthy can still transmit HIV. In the same study, 51% of the participants thought they are at no risk when having unprotected sex with casual partners. Among 70% of youth who would like an HIV test, only 6% have had done the test [3].

When the HIV test was developed in mid 1980s, testing was intended to be accompanied by HIV counseling [4]. However, with the growing awareness of Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS) and the recent availability of antiretroviral therapy (ART), the scope of and reasons for voluntary counseling and HIV testing (VCT) have broadened. VCT is a process by which an individual undergoes counseling to enable the youth to make an informed decision about being tested for HIV, assess their personal risk for HIV and develop a risk reduction strategy. The services are essential components of HIV prevention and care programs. However, initially many people were reluctant to be tested even if care and treatment were made available to them [4].

HIV/AIDS epidemic among youth is largely ignored and remains invisible to both young people themselves and to society as a whole. They are more likely to carry the virus for years without knowing that they are infected, consequently the epidemic spreads beyond high risk groups to the broader population of young people that making control harder and current data indicates that about 20% of young people aged 15–19 years (mainly secondary school students) are infected with HIV virus [5].

HIV voluntary counseling and testing (VCT) is now widely accepted as the cornerstone of HIV prevention programs in many countries because of its multiple benefits. Furthermore, VCT is the gateway to comprehensive HIV care and support including access to antiretroviral therapy [3]. Many people including the young do not seek VCT services until they develop symptoms of AIDS. Among the youth, barriers to VCT include lack of information, perception of low risk, lack of privacy and confidentiality, costs and laws that require parental consent [5].

In Ethiopia, according to the ministry of health (MoH), HIV prevalence was more pronounced in younger age groups of 15–30 years including a 8.6% of antenatal care (ANC) attendants in the same age groups were HIV positive. HIV counseling in Ethiopia began in the late 1980s with service expanding throughout 1990s, and it is reported that many people with HIV in Ethiopia do not know that they are infected [6].

A study conducted among high school student in Addis Ababa showed that 62% of the students who supported on utilization of condom at the time of sex answered that 42% of sexually active students reported using it on their first sexual encounter while only 28% said that they used it every time [7]. One study carried out to assess the perception of high school students on risks for acquiring HIV and use of VCT service reported that among sexually active students, 12 (40%) had sex with different persons within the last 6 months, 13 (43.3%) had ever used condom and 15 (50%) had used VCT service [8].

One study done among university students in Ethiopia reported practicing casual sex/ sex for any benefit with their first sexual partner and multiple sexual partners in the last 12 months were found to be the independent predictors of risks for STIs and/or HIV infection [9]. Therefore, the main objective of this study was to assess risky sexual behavior of university students towards HIV/AIDS and use of VCT service.

Methods

Study area and study period
The study was conducted from May to June 2013 in Addis Ababa City administration.

Study design
Cross sectional study design.
Study population
All regular students of Addis Ababa Science and Technology University were considered as the study population.

Sample size determination
Sample size was determined based on assumptions including 95% confidence level, 4% margin of error (to increase degree of precision) and 15% for anticipated non-response rate of the respondents. Hence, a total of 602 participants were considered.

Sampling procedure
Schools were identified based on their labeled departments in the University. At the same time, the study populations were also categorized from source population based on their schools. Then, Out of the total 23 departments, 15 departments were selected based on simple random sampling. The number of study subjects included in each department was proportional to their size. The students from the selected departments assembled in a room and were made to fill out a questionnaire in the presence of date collectors.

Exclusion criteria
Students who were not attending their class at the time of data collection and those students who were learning in the evening were excluded from the study.

Instrument of data collection and techniques
Data were collected using self-administered structure questionnaire. The questionnaire was prepared in English. Questions used to assess knowledge, attitude and practice of students towards HIV transmission and on VCT were adopted from different related studies. A Pre-test was conducted on 10% (60) of the students in the University. This helped us to verify the validity and reliability issues. The questionnaire was revised based on the findings of the pilot test.

Data collection and quality control
Data collection was conducted by two graduate nurses. Data collectors received a half day training on issues concerning the questionnaire (on the objective of the study, the how of approaching the participants, how to administer and collect the questionnaires timely) was done. Consequently, the questionnaire was revised before data collectors were disseminated to collect data. Confidentiality of the study participants were kept during distribution and data collection periods. Above all, ethics, coding and entry were maintained throughout the process.

Dependent variables
Knowledge and attitude of students towards HIV risk perception were considered as dependent variables.

Independent variables
Age, sex, region, department, year of study and religion were considered as independent variables.

Operational definitions
Health Science Departments include Public Health Officer and Nursing.
Non-Health Science departments include Basic Science and Engineering Departments.
   Basic Science Departments: Industrial Chemistry, Computer Science and Information Technology, Ecobiology, Earth Science, Biotechnology).
   Engineering Departments: Water Supply Engineering, Urban Planning and Design Engineering, Manufacturing Engineering, Food Processing Engineering, Environmental Engineering, Electro-Mechanical Engineering, Electrical and Electronics Engineering, Architecture Engineering.

Risk
A situation in which an action will result in an outcome that is not known with certainty, but the set of possible outcomes and their associated probabilities are known or can be estimated.

Behaviour
Various voluntary movements undertaken by the body in response to motives and decision related to HIV preventive methods.

Perception risk
Students’ attitude towards perceiving themselves as susceptible to HIV infection.

Data analysis
Questionnaires were checked for completeness. Partially completed questionnaires were excluded from analysis. The questionnaires were coded and the data entered in to EPI-Info version 2002 statistical package and analyzed by SPSS Version 16.0 package. Departments from which students are selected to participate were categorized into three broad themes (as Health Science, Basic Science and Engineering students). The score of one or zero was given based on the correct or wrong answer to individual knowledge and attitude questions. The knowledge score of 50.0% or above was graded as good knowledge and below this cut-off point as poor knowledge. The score of 50.0% and below was graded as unfavourable attitude and above this cut-off point as favourable attitude. Whereas students were categorized as with safe practice when they were involved in none of the risky practices.
Collected data were summarized using frequency, percentages, and ratios. Chi-square ($\chi^2$), binary/multiple logistic regression analyses were computed in order to assess the association and measure the level of significance of the association, respectively. Further, logistic regression was used to adjust for possible confounding factors. Results were reported using $P < 0.05$ level of statistical significance.

**Ethical considerations**
Ethical approval was obtained from the Institutional Review Board of Addis Ababa Science and Technology University. Consent was requested and obtained from each student prior to the study. No personal identification was recorded on the questionnaire for ethical reason. The respondents had the right not to participate in or withdraw from the study at any stage.

**Results**

**Socio-demographic characters**
A total of 602 students agreed to participate and completed the questionnaire. An overall response rate of 92.6% were reported. Whenever the number of students responded for a particular question is less than 602 are shown in bracket next to each question. Participant students were in the Health Science 108(18%), Basic Science 234(38.9%) and Engineering 260 (43.2%) fields of studies (Fig. 1).

The study revealed that out of the total participants 361 (60%) of the participants were males, and the mean age of the participants was 20.3 ± 1.6 which ranges from 17 to 25 years old. The majority 385 (64%) of the participants were in the age group of 17 and 20 years. Most of the students 263 (43.7%) were from Amhara Ethnic group followed by Oromia 170 (28.2%). Orthodox 408 (67.8%) and Protestant 94 (13.8%) religion followers were the dominant religions among the participants (Table 1).

**Students knowledge on HIV infection**
Two hundred forty three (42%) of the participants believed that HIV can be transmitted through kissing and sharing different equipment. Among 576 study subjects who responded, 66 (11.5%) of individuals did not know about Sexual Transmitted Diseases (STDs), and further 51 (10%) of study subjects also didn’t have the knowledge of HIV as one of STDs. The overall mean score of knowledge of students towards HIV was 65.9% (Table 2).

**Students’ risk perception towards HIV infection**
Participants’ perception on their risk of acquiring HIV infection was asked. Among the 560 students who replied, the result indicated that 199 (35.5%) of them believed to have risk and 361 (64.5%) not. The proportions of students who perceived themselves at risk of contracting HIV were not similar for both sexes (123 (61.8%) for male and 76 (38.2%) for female) and moreover, students enrolled in the non-health departments reported to have

![Table 1](https://example.com/table1.png)

| Characteristics | Frequency | Percentage |
|-----------------|-----------|------------|
| Age group (Years) |           |            |
| 17-20           | 385       | 64.0       |
| 21-25           | 209       | 34.7       |
| 26+             | 8         | 1.3        |
| Sex             |           |            |
| Male            | 361       | 60         |
| Female          | 241       | 40         |
| Ethnicity       |           |            |
| Amhara          | 263       | 43.7       |
| Oromo           | 170       | 28.2       |
| Tigray          | 125       | 20.8       |
| Other           | 44        | 7.3        |
| Class year      |           |            |
| First           | 175       | 29.1       |
| Second          | 427       | 70.9       |
| Religion        |           |            |
| Orthodox        | 408       | 67.8       |
| Protestant      | 94        | 15.6       |
| Muslim          | 82        | 13.6       |
| Catholic        | 9         | 1.5        |
| Other           | 9         | 1.5        |
high risk 171 (85.9%) for acquiring HIV when compared to health students 28 (14.1%).

Students’ attitude towards HIV infection
Among the 582 participants who responded, 83 (14.19%) did not believe that HIV is severe, and it affects more youth than other group of population. And, 116 (20.7%) of students did not believe that maintaining virginity before marriage doesn’t help for the prevention of HIV/AIDS. The overall mean score of attitude of students towards risk perception on HIV was 56.6% (Table 3).

Sexual behaviour of students
One hundred sixty one (26.8%) of the respondents had sexual experience. Out of whom, 33 (20.5%) were females and the rest 128 (79.5%) were males. The students’ age to start sex was ranged from 15 up to 19. With regards to use of condom, 74 (46%) of respondents claimed that they did not use at the first time of intercourse (Table 4). Among those students who responded to question about use of condom during sexual intercourse, 25 (21.4%) did not use condom during sex (Table 4). Among those who responded to the question for whether they had more than one sexual partner 40 (28.2%) of them said yes. The main reasons mentioned by students for having multiple sexual partners include to satisfy sexual desire 33 (82.5%), due to cultural reasons 6 (15%), due to seeking to have more children 1 (2.5%) and economic reason 1 (2.5%). Among male students who started sex, 23 (18%) of them ever had sex with commercial sex workers (Table 4).

Table 2 Knowledge on HIV/AIDS in Addis Ababa Sciences and Technology University Students, Addis Ababa, May to June 2013

| Knowledge | Frequency | Percentage |
|-----------|-----------|------------|
| Do you think Condoms can prevent STDs? (N = 581) | | |
| Yes | 443 | 76.2 |
| No | 134 | 23.1 |
| Probably | 4 | 0.7 |
| Can HIV transmit through kissing and sharing equipment (N = 583) | | |
| Yes | 243 | 41.7 |
| No | 307 | 52.6 |
| I don’t know | 33 | 5.7 |
| Is HIV STDs? (N = 491) | | |
| Yes | 440 | 89.6 |
| No | 51 | 10.4 |
| Can HIV transmit through breast feeding (N = 563) | | |
| Yes | 311 | 55.2 |
| No | 252 | 44.8 |
| Know about STDs (N = 576) | | |
| Yes | 510 | 88.45 |
| No | 66 | 11.5 |

Table 3 Attitude on HIV/AIDS at Addis Ababa Sciences and Technology University Students, Addis Ababa, May to June 2013

| Character | Frequency | Percentage |
|-----------|-----------|------------|
| Do you think HIV/AIDS is dangerous and has no cure? N = 579 | | |
| Yes | 458 | 79.1 |
| No | 94 | 16.2 |
| I don’t know | 27 | 4.7 |
| Do you think HIV/AIDS and other STDs cannot transmit while having sex with known person? N = 571 | | |
| Yes | 152 | 26.6 |
| No | 372 | 65.2 |
| I don’t know | 47 | 8.2 |
| Do you believe commercial sex workers responsible for HIV transmission? N = 565 | | |
| Yes | 355 | 62.8 |
| No | 210 | 37.2 |
| Do you think you are at risk of acquiring HIV Infection? N = 560 | | |
| Yes | 199 | 35.5 |
| No | 361 | 64.5 |
| What is your chance of acquiring HIV infection? N = 571 | | |
| No | 151 | 26.4 |
| Low | 308 | 53.9 |
| Medium | 22 | 3.9 |
| High | 45 | 7.9 |
| I do not know | 45 | 7.9 |
| Do you believe only those people who lead immoral lives will get HIV? N = 567 | | |
| Yes | 188 | 33.2 |
| No | 379 | 66.8 |
| AIDS patients should be isolated for the safety of others: N = 586 | | |
| Agree | 185 | 31.6 |
| Disagree | 401 | 68.4 |
| Do you think HIV/AIDS is sever and more affects youth? N = 582 | | |
| Agree | 499 | 85.7 |
| Disagree | 83 | 14.3 |
| Women are more responsible than men for prostitution: N = 566 | | |
| Agree | 394 | 69.6 |
| Disagree | 172 | 30.4 |
| What is your perception about maintaining virginity for prevention of HIV/AIDS? N = 560 | | |
| It prevents HIV | 300 | 53.6 |
| It doesn’t prevent HIV | 116 | 20.7 |
| No response | 144 | 25.7 |
than students in non-health departments (Table 5). Moreover, students enrolled in health departments had almost two and half times more favourable attitude [AOR (95% CI) = 2.55 (1.60, 4.06)] \((P < 0.05)\) towards HIV prevention methods than students in non-health departments (Table 6). However, variables like sex, age, study year, religion and ethnicity did not show any association with both knowledge and attitude of students \((P > 0.05)\) towards HIV prevention strategies.

### Knowledge, attitude and practice towards VCT

Among those students who responded to the question, 488 (83.4%) heard about VCT services. Majority of the participants 510 (89.9%) thought that getting VCT service is necessary. But, 210 (36%) of participants did not know about the existence of the service at the University (Table 7). Out of 589 students who responded to the question, 457 (77.6%) were willing to be tested for HIV if they are asked to while the rest 132 (22.4) were not (Table 7). Moreover 468 (81%) of students wanted to hear their test result on face to face basis. On the other hand, among reasons mentioned 114 (52.8) and 50 (23%) of participants were not ready to take the VCT service because of the absences of previous sexual intercourse and fear of stigma by the society, respectively. A total of 479 (82.4%) respondents agreed that getting HIV blood test would provide safety for others (Table 7).

With regards to timing for testing, majority of the students 457 (77.6%) were willing to be tested for HIV if they are asked to while the rest 132 (22.4) were not (Table 7). Moreover 468 (81%) of students wanted to hear their test result on face to face basis. On the other hand, among reasons mentioned 114 (52.8) and 50 (23%) of participants were not ready to take the VCT service because of the absences of previous sexual intercourse and fear of stigma by the society, respectively. A total of 479 (82.4%) respondents agreed that getting HIV blood test would provide safety for others (Table 7).

Out of 573 students, only 275 (48%) ever used VCT. Reasons mentioned to undergo VCT were, 83 (31.7%) did it for marriage, 75 (28.6%) to know ones sero-status,
65 (24.8%) to prevent transmission of virus to the fetus, and 39 (14.9%) just to confirm to friends. Among reasons mentioned not to use VCT, no experience of sexual intercourse was the highest 114 (52.8%) and 50 (23%) of them mentioned feared stigma by the society if found positive (Table 7).

**Discussion**

Overall, the result from our study demonstrated that the students had a moderate level of HIV/AIDS knowledge, with an average score of 66%. This result is similar to studies conducted among students in Ghana and Yemen [10, 11].

Our study revealed that around 42% participants thought that HIV could be transmitted through kissing and sharing of different equipment. Similar studies carried out in Lao People’s Democratic Republic and Yemen [11, 12] which supported our findings.

Another interesting finding of the current study was that almost 90% of the study subjects knew HIV as one of the STDs and over 55% participants were tested for HIV. This finding is consistent with other studies conducted in Hawasa Town and Gambella Region of Ethiopia [13, 14].

In this study, students enrolled in health departments were almost three times more knowledgeable [AOR (95% CI) = 2.83 (1.67, 4.80)] than students in non-health departments. This could be better explained due to the fact that curriculum of health science programs incorporated facts about infectious diseases in general and HIV/AIDS in particular. Similar findings were reported in a questionnaire based study to assess HIV/AIDS knowledge, attitude and behaviors of Chinese students in China which supported the finding that students majoring in medicine had more knowledge than non-medical students [10].

Overall, respondents’ attitude towards HIV/AIDS infection was 75.5%. Moreover, attitude of respondents about people who live with HIV were moderately positive with the average mean score of 66.4%. Studies conducted in Gambella in Ethiopia, Nigeria and Kerala University in India [14–16] showed similar results.

Students enrolled in health departments had almost two and half times more favorable attitude [AOR (95% CI) =

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**Table 5** Association of socio-demographic characteristics and knowledge of AASTU Students towards HIV infection May to June 2013

| Variables   | Good knowledge | OR (95%CI) | OR (95%CI) | P-value |
|-------------|----------------|------------|------------|---------|
|             | Yes (%)        | No (%)     | Crude      | Adjusted |
| Age         |                |            |            |         |
| 17-20       | 262(43.5)      | 123(20.4)  | 1.00       |         |
| 21-25       | 128(21.3)      | 81(13.5)   | 0.74 (0.52, 1.05) |         |
| + 25        | 7(1.2)         |            | 3.3 (0.4, 27.0) |         |
| Sex         |                |            |            |         |
| Male        | 247(41.0)      | 91(15.1)   | 1.00       |         |
| Female      | 150(24.9)      | 114(18.9)  | 1.3 (0.93, 1.85) |         |
| Ethnicity   |                |            |            |         |
| Oromia      | 108(17.9)      | 62(10.3)   | 1.00       |         |
| Amhara      | 177(29.4)      | 86(14.3)   | 1.18 (0.79, 1.77) |         |
| Tigray      | 87(14.5)       | 38(6.3)    | 1.31 (0.80, 2.15) |         |
| Other       | 25(4.2)        | 19(3.2)    | 0.75 (0.38, 1.49) |         |
| Department  |                |            |            |         |
| Non-health  | 308(51.2)      | 186(30.9)  | 1.00       | 1.00    |
| Health      | 89(14.8)       | 19(3.1)    | 2.83 (1.67, 4.80)* | 2.83 (1.67, 4.80)* | 0.001* |
| Year of study|              |            |            |         |
| Year I      | 115(19.1)      | 60(10)     | 1.00       |         |
| Year II     | 282(46.8)      | 145(24.1)  | 1.00(0.70, 1.47) |         |
| Religion    |                |            |            |         |
| Orthodox    | 273(45.3)      | 135(22.4)  | 1.00       |         |
| Muslim      | 49(8.1)        | 33(5.5)    | 0.73 (0.47, 1.39) |         |
| Catholic    | 5(0.8)         | 4(0.7)     | 0.62 (0.16, 2.34) |         |
| Protestant  | 65(10.8)       | 29(4.8)    | 1.11 (0.68, 1.80) |         |
| Others      | 5(0.8)         | 4(0.7)     | 0.62 (0.16, 2.34) |         |

* Significant P < 0.05 level
towards HIV prevention methods than students in non-health departments. However, in comparative study [17] conducted among undergraduate students at Addis Ababa University of Ethiopia showed that there was no association between students’ attitude towards HIV prevention methods and their departments’ type (health science vs non-health science). In our study, the absence of association between attitude of students by ethnicity and by religion might be linked with sharing of the same cultural values by the students due to their social integration in the campus, which influences them to have similar attitude towards HIV prevention strategies.

Our study revealed that 78.6% of the participants used condom whenever they practice sexual intercourse, and around 18% of participants practiced sex with commercial sex workers. Similar report was obtained in researches conducted at Nigeria, Yemen and China [10, 11, 16].

The unwillingness of students to take HIV test in the study could be attributed to fear, anxiety stigma and discrimination which are linked to HIV/AIDS. Fear of stigma had shown to influence young adults to become less likely to engage in preventive behaviors like taking VCT service [10, 16].

The current study revealed that from the total 26.8% of the students had a history of sexual intercourse. Of these, 54%) of the students said they were using condoms during their first sex. Almost 8414.3% of students were using condoms regularly when they had sex with casual partners. This finding disagree with the result reported in Lao People’s Democratic Republic [12].

In our study, 83.4% of the students had heard about VCT service. The most common benefits of VCT mentioned were for marriage (31.7%), and to know HIV sero-status (28.6%). About 53.5% of the respondents had favorable attitude towards VCT service. The majority (77.6%) of the students were willing to take HIV test whether they did it or not in the past. Among those who had no desire for VCT, 52.8% mentioned it due to the absence of previous sexual intercourse followed by the fear of stigma by the society (23.1%). Similar results had been reported by studies done in Ethiopia and in Kenya [18–20].
Table 7 Knowledge, attitude and practice on VCT at Addis Ababa Sciences and Technology University Students, Addis Ababa, May to June, 2013

Knowledge

| Character                                      | Frequency | Percentage |
|-----------------------------------------------|-----------|------------|
| Do you heard information about VCT (N = 585)  | 488       | 83.4       |
| Yes                                           |           |            |
| No                                            | 97        | 16.6       |
| Source of information (N = 585)               |           |            |
| Mass media                                    | 250       | 42.7       |
| Newsletter                                    | 150       | 25.6       |
| Colleague                                     | 100       | 17.1       |
| Health professionals                          | 70        | 12.0       |
| Others                                        | 15        | 2.6        |
| Knowing the presence of VCT provision center around (N = 582) | 372 | 64 |
| Yes                                           |           |            |
| No                                            | 210       | 36         |
| Perceived importance of getting VCT (N = 577)  |           |            |
| Important                                     | 542       | 93.9       |
| Not-important                                  | 35        | 6.1        |

Attitude

| Do you agree that getting HIV blood test would provide safety for others? N = 581 | Frequency | Percentage |
|-----------------------------------------------------------------------------|-----------|------------|
| Agree                                                                      | 479       | 82.4       |
| Disagree                                                                   | 52        | 8.9        |
| Neutral                                                                    | 50        | 8.7        |

Do you think VCT is necessary? (N = 567) |

| Yes                                           | 510       | 89.9       |
| No                                            | 57        | 10.1       |

Did VCT test help you in any way (e.g. alleviating your anxiety?) N = 264

| Agree                                                                      | 202       | 76.5       |
| Disagree                                                                   | 24        | 9.1        |
| Neutral                                                                    | 38        | 14.4       |

Preferable ways of getting HIV test result (N = 578)

| Face to face | 468 | 81.0 |
| Secretive letter | 54 | 9.3 |
| Telephone      | 29  | 5.0  |
| From relative or partner       | 18  | 3.1  |
| Others                        | 9   | 1.6  |

When do you think one should get VCT service (N = 561)

| At any time | 459 | 81.9 |
| While feeling sick | 58  | 10.3 |
| Only when involved with many sexual partners | 23  | 6.0 |
| When ready for marriage | 13  | 2.4 |
| Others                        | 8   | 1.4  |

Conclusions

Almost two-third of the students were knowledgeable on HIV and only 56.6% of the respondent had favorable attitudes towards its prevention methods. Students were involved at different stages of risk for acquiring HIV infection. Students of health department had significant knowledge on HIV and attitude toward its prevention as compared from other department of students. In general, majority of the students had not used VCT services but were willing to use VCT service if contacted. It is recommended to design HIV prevention and control strategy including scaling up of VCT services at university level for increasing students’ awareness about HIV especially for those students who are in non-health related departments. And, future similar studies using qualitative methods are also highly recommended.

Abbreviations

AASTU: Addis Ababa Science and Technology University; AIDS: Acquired Immunodeficiency Syndrome; ART: Anti Retroviral Therapy; CI: Confidence Interval; HIV: Human Immunodeficiency Virus; OR: Odds Ratio; SPSS: Statistical Package for Social Sciences; STIs: Sexually Transmitted Diseases; STDs: Sexually Transmitted Infections; VCT: Voluntary Counseling and Testing; WHO: World Health Organization

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Availability of data and materials
The datasets during and/or analyzed during the current study available from the corresponding author on reasonable request.

Authors’ contributions
DW: initiation of the study, design, implementation, analysis, write-up and prepared the manuscript for publication. YA: analyzed the data, interpreted the results and write-up of the manuscript. SS: analyzed the data, interpreted the results and reviewed the final manuscript. WH, KB and ZT: analyzed the data and interpreted results. All authors read and approved the manuscript.

Competing interests
The authors declare that they have no competing interests.

Consent for publication
Not applicable.

Ethics approval and consent to participate
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