

# Assessment of factors associated with voluntary counseling and testing uptake among students in Bahir Dar University: A case control study

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## Abstract

**Background:** Voluntary counseling and testing (VCT) is one of the cornerstones for successful implementation of HIV prevention, care and support services among HIV negative and positive individuals.

**Objectives:** This study was intended to assess the factors associated with the use of VCT service among students in Bahir Dar University

**Methods:** Unmatched case-control study was conducted among 158 cases (who had received VCT services) and 318 control students from March 20 to May 10, 2010. The study subjects were selected randomly among 452 students who had received VCT and 2548 controls. Data were collected using a pre-tested self-administered questionnaire.

**Results:** The findings indicated that male [OR= 1.84 (95% CI: 1.15, 2.92)], married [AOR=2.95 (95% CI: 1.23, 7.10)] and senior students [AOR=8.64 (2.70, 24.13)] were more likely to be tested than their counterparts. Knowledge, [AOR=2.44 (95% CI: 1.39, 4.28)], attitude [AOR=2.23 (95% CI: 1.19, 4.16)] and risk perception [AOR=5.43 (95% CI: 3.38, 8.72)] showed significant association with VCT service.

**Conclusion:** In order to promote VCT service, more emphasis should be given to the knowledge and attitudes of students towards VCT, and to help the students to internalize the risk of HIV so that they can take preventive measures. Furthermore, strategies should be designed to help senior students to be tested. [*Ethiop. J. Health Dev.* 2012;26(1):16-21]

## Introduction

Ethiopia is one of the sub-Saharan countries highly affected by the HIV/AIDS pandemic. The adult prevalence of HIV infection in Ethiopia was estimated at 2.4% in which most of the burden occurring among the young age groups (1).

Recent studies indicate that overall coverage of voluntary counseling and testing (VCT) are extremely poor in countries with very high HIV/AIDS burden. Only 5% of the people with HIV/AIDS are estimated to be aware of their status worldwide (2).

Access to VCT is key for successfully implementing anti-retroviral treatment and avoiding re-infection and transmission through behavioral changes. Voluntary counseling and testing (VCT) also entry points for successful implementation of prevention, care and support services among both HIV negative and positive individuals. Effective knowledge of HIV status is critical to expanding access to HIV treatment, care and support timely and in offering people living with HIV an opportunity to receive information and tools to prevent transmission to others.

However, VCT service is not available in most regions of Africa (3, 4). For our things there is a scarcity of information regarding barriers to HIV testing in sub-Saharan Africa including Ethiopia (5). Available studies in Ethiopia indicated that only 41% of the school-youth were aware of the existence of confidential HIV testing in their vicinity. The proportion of youth that had VCT was below 10 % (6). In these studies, nearly half of the youth perceived themselves to be at low or no risk in spite of engagement in multiple sexual partnerships (6).

VCT is also perceived to be an effective strategy in risk reduction among sexually active young people (7).

But, the overall condition of the use of VCT in Ethiopia calls for scaled up and coordinated activities to improve the service based on real evidence. In addition, students in Bahir Dar are at risk of HIV because of the high prevalence of HIV compounded by the tourist attractions of the city that promote the development of hotels, and night clubs. Thus, this study attempted to assess the factors that contribute to the use of VCT service among students of Bahir Dar University.

## Methods

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### Study design and area

Unmatched case-control study was designed to assess uptake of VCT for HIV among students in Bahir Dar University from March 20 to May 10, 2010. Bahir Dar University is one of the 31 universities in Ethiopia with a student body of more than ten thousand. At the time of the study, it had about 15,800 regular students. Bahir Dar City has many hotels, and night clubs and it is a tourist attraction because of Lake Tana and its monasteries. This situation may contribute to the risks of HIV transmission. The prevalence of HIV among Ethiopian youth is 13.3% (22) whereas in Bahir Dar it is 3.5% (23).

### Study subjects

The study subjects were students who were counseled and tested for HIV while the controls were not.

### Sample size determination and procedures

Study subjects were first identified as cases and controls by observing the VCT identity card in a baseline survey among 3000 students. A total of 452 cases and 2548 controls were identified as a source of the study population. The required samples were selected randomly from the total identified cases and controls.

The sample size was determined using two population proportion with a control ratio of 1:2, with a level of confidence and 95%, power of the study at 90% with the following assumptions:

Knowledge of controls towards VCT = 49.6 % (6) and odds ratio being detected to be 2. Then using Epi-Info for unmatched case-control study and adding 10% contingency for non-responses, we obtained a sample size of 160 cases and 319 controls.

**Inclusion and exclusion criteria:** Generic regular volunteer students were included and students who were unable to read or communicate were excluded from the study.

**Outcomes of interest:** VCT uptake.

### Data collection

Data were collected using a structured, pre-tested and self-administered questionnaire. Pretesting was done among 5% of the sample in Bahir Dar Health College. Trained nurse facilitators guided the data collection process. The questionnaire was adopted from Demographic Health Survey 2005 and prepared in English, which was translated into Amharic. All questionnaires were completed individually in a classroom.

### Data analysis and measurement

Data were analyzed using the SPSS version 16 statistical software package. Association between variables was determined using odds ratio and 95% CI. Multivariable/logistic regression was run by selecting those variables that appeared to have ( $p < 20\%$ ) in the bivariate analysis to see the effects of explanatory variables on the outcome.

Knowledge was measured using five questions about the modes of prevention and transmission with three alternative answers: 'yes', 'no' and 'do not know'. These included the actual mode of transmissions such as unsafe sexual intercourse, unsafe blood transfusion, mother to child transmission, using contaminated sharp objects and misconceptions such as eating together, shaking hands, mosquito bites and sharing toilets. Correct responses were given a value of "1" and incorrect, misconceptions and do not know responses were given "0". The sum was computed and the mean was used as a cut-off point. Respondents who had scored above and below the mean were considered as having high and low knowledge, respectively.

Attitude was measured by using attitude related questions like being willing to adopt safer sexual practices. If the respondent agreed to a positive statement, a score of "1" was given.

If the respondent disagreed or had no response, a value of "0" was given. Respondents, who scored above and below the mean, were regarded as having positive and negative attitudes respectively.

### Ethical Considerations

Institutional ethical clearance was obtained from the research and publication office of the University of Gondar. Permission to conduct this study in Bahir Dar was obtained from the University. Individual consents were sought from the study participants before starting the study; participants were requested to agree after they understood the study aims and before answering any of the questions. Confidentiality was assured through anonymously collecting and analyzing the responses to the questionnaires.

### Results

We obtained an overall high response rate of 99.4% by involving 158 (33%) cases and 318 (67%) controls.

One hundred twenty one (76.6%) cases and 178 (59.1%) controls were male, and 88 (55.7%) of the cases and 171 (53.7%) of the controls were in the age group between 21 and 23 years. The median was 21 and mean age was 21.02 years. One hundred forty three (90.5%) of the cases and 309 (97.2%) of the controls were unmarried. Sixty eight (43.1%) the forms and 152 (47.80%) of the

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latter controls were 3<sup>rd</sup> and 2<sup>nd</sup> year students, respectively (Table 1).

Association of socio-demographic variables and voluntary HIV testing was assessed. After controlling for the effects of other socio-demographic variables, males were 1.8 times more likely to accept voluntary HIV testing as compared to the females [OR= 1.84 (95% CI: 1.15, 2.92)]. Married students were 2.9 times more likely to accept voluntary HIV testing than single ones, [AOR=2.95 (95% CI: 1.23, 7.10)]. With regard to years of study 1<sup>st</sup>, 2<sup>nd</sup> & 3<sup>rd</sup> year students were more likely to be tested than 4<sup>th</sup> year students, [AOR= 5.99(95% CI: 1.92, 18.77), AOR=4.73(1.62, 12.8) & AOR=8.64 (2.70,

24.13)], respectively. However, age, ethnicity and religion were not associated with the use of voluntary HIV testing (Table 2).

Students who had high knowledge about HIV and VCT were 2.4 times more likely to be tested than their counterparts, [AOR=2.44 (95% CI: 1.39, 4.28)]. Similarly, uptake of HIV testing was higher among those who had a positive attitude towards VCT than those who had a negative attitude, [AOR=2.43 (95% CI: 1.33, 4.47)]. Students who perceived themselves to be at risk of HIV were 6.3 times more likely to be tested than those who did not, OR=6.31(95% CI: 3.96, 10.10) (Table 3).

**Table 1: The Socio-demographic characteristics of students in Bahir Dar University, Ethiopia (n=476), May, 2010**

Socio-demographic Variables	Users (Cases)	Non-users (Controls)	P-value	Total Number (%)
<b>Sex</b>				
Male	121 (76.6)	188 (59.1)	0.007	309 (64.9)
Female	37 (23.4)	130 (40.9)		167 (35.1)
<b>Age</b>				
18-20	62 (8.8)	134 (42.2)	0.852	196 (41.2)
31-23	88	171 (53.7)		259 (54.4)
24 and above	8 (3.2)	13 (4.1)		21 (4.4)
Mean (SD)	21.10 (1.43)	20.98 (1.41)		20.02 (1.42)
Median age	21.00	21.00		21.00
<b>Religion</b>				
Orthodox Christian	132 (83.5)	248 (78.0)	0.934	380 (79.8)
Protestant	12 (7.6)	34 (10.5)		43 (9)
Catholic	2 (1.3)	5 (1.6)		46 (9.7)
Muslim	12 (7.6)	31 (9.7)		7 (1.5)
<b>Ethnicity</b>				
Amhara	109 (69.0)	187 (58.8)	0.253	296 (62.1)
Oromo	4 (7.6)	54 (17.0)		68 (14.3)
Tigre	17 (10.8)	29 (9.1)		49 (10.3)
Gurage	7 (4.4)	21 (6.6)		28 (5.9)
Others	13 (8.2)	27 (8.5)		40 (8.4)
<b>Years of study</b>				
1 <sup>st</sup> year	24 (15.2)	46 (14.5)	0.000	70 (14.7)
2 <sup>nd</sup> year	62 (39.2)	152 (47.8)		214 (45.0)
3 <sup>rd</sup> year	68 (43.1)	74 (23.2)		142 (29.8)
4 <sup>th</sup> year	4 (2.5)	46 (14.5)		50 (10.5)
<b>Marital status</b>				
Married	15 (9.5)	9 (2.8)	0.015	24 (5.0)
Single	143 (90.5)	309 (97.2)		452 (95.0)

Table 2: The Effect of socio-demographic factors on HIV testing among students in Bahir Dar University, Ethiopia, (n=476), May, 2010

Socio-demographic Variables	Users (Cases)	Non-users (Controls)	Crude OR (95% CI)	Adjusted OR 95% CI)
<b>Sex</b>				
Male	121 (76.6)	188 (59.1)	2.26 (1.44, 3.48)	<b>1.84 (1.15, 2.9)</b>
Female	37 (23.4)	130 (40.9)	1.0	1.0
<b>Age</b>				
18-20	62 (8.8)	134 (42.2)	0.75 (0.29, 1.91)	1.28 (0.47, 3.47)
31-23	88 (88.0)	171 (53.7)	0.84 (0.33, 2.10)	1.12 (0.43, 2.91)
24 and above	8 (3.2)	13 (4.1)	1.0	1.0
<b>Religion</b>				
Orthodox Christian	132 (83.5)	248 (78.0)	1.38 (0.68, 2.75)	1.26 (0.60, 2.64)
Protestant	12 (7.6)	34 (10.5)	0.91 (0.36, 2.33)	1.23 (0.45, 3.39)
Catholic	2 (1.3)	5 (1.6)	1.03 (0.18, 6.10)	1.52 (0.22, 10.23)
Muslim	12 (7.6)	31 (9.7)	1.0	1.0
<b>Ethnicity</b>				
Amhara	109 (69.0)	187 (58.8)	1.21 (0.60, 2.44)	0.82 (0.37, 1.78)
Oromo	4 (7.6)	54 (17.0)	0.46 (0.18, 1.15)	0.43 (0.17, 1.14)
Tigre	17 (10.8)	29 (9.1)	1.22 (0.54, 2.01)	1.15 (0.44, 2.32)
Gurage	7 (4.4)	21 (6.6)	0.69 (0.23, 2.04)	1.14 (0.36, 2.32)
Others	13 (8.2)	27 (8.5)	1.0	1.0
<b>Years of study</b>				
1 <sup>st</sup> year	24 (15.2)	46 (14.5)	6.00 (1.93, 18.66)	<b>5.00 (1.9, 18.77)</b>
2 <sup>nd</sup> year	62 (39.2)	152 (47.8)	4.69 (0.31, 1.03)	<b>4.73 (1.62, 12.8)</b>
3 <sup>rd</sup> year	68 (43.1)	74 (23.2)	10.0 (1.93, 18.66)	<b>8.64 (2.66, 24.13)</b>
4 <sup>th</sup> year	4 (2.5)	46 (14.5)	1.0	1.0
<b>Marital status</b>				
Married	15 (9.5)	9 (2.8)	3.60 (1.54, 8.42)	<b>2.95 (1.23, 7.10)</b>
Single	143 (90.5)	309 (97.2)	1.0	1.0

Table 3: Proximate determinants of voluntary HIV counseling and testing among Bahir Dar University students, Bahir Dar, Ethiopia (n=476), May, 2010

Intermediate Variables	Users (Cases)	Non-users (Controls)	Crude OR (95% CI)	Adjusted OR 95% CI)
<b>Knowledge</b>				
Yes	137 (86.7)	225 (70.7)	2.69 (1.60, 4.53)	<b>2.44 (1.39, 4.5)</b>
No	21 (13.3)	93 (29.3)	1.0	1.0
<b>Attitude</b>				
Positive	141 (89.2)	234 (73.5)	2.97 (1.69, 5.22)	<b>2.43 (1.33, 4.5)</b>
Negative	17 (10.8)	84 (26.5)	1.0	1.0
<b>Risk of HIV</b>				
Yes	126 (79.7)	122 (38.4)	6.33 (4.04, 9.91)	<b>6.31 (3.96, 10.0)</b>
No	32 (20.3)	196 (61.6)	1.0	1.0
<b>Benefit of VCT</b>				
Yes	138 (87.3)	276 (86.8)	1.05 (0.6, 1.86)	1.39 (0.70, 2.78)
No	20 (12.7)	42 (13.2)	1.0	1.0
<b>Stigma</b>				
No	114 (72.2)	214 (67.3)	1.26 (0.83, 1.92)	1.50 (0.93, 2.41)
Yes	44 (27.8)	104 (32.7)	1.0	1.0
<b>Confidentiality</b>				
Yes	99 (62.6)	178 (55.9)	1.32 (0.89, 1.95)	1.10 (0.68, 1.69)
No	59 (37.4)	140 (44.1)	1.0	1.0
<b>Had ever sex</b>				
Yes	54 (34.2)	86 (27.1)	1.49 (0.93, 2.11)	1.18 (0.74, 1.91)
No	104 (65.8)	232 (72.9)	1.0	1.0
<b>Disclosure</b>				
Yes	109 (69)	187 (58.8)	1.55 (1.03, 2.32)	1.25 (0.79, 1.97)
No	49 (31)	131 (41.2)	1.0	1.0

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## Discussion

Students in Bahir Dar University have high knowledge and attitude about HIV/AIDS and VCT. In addition, married, female and 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> year students were more likely to be tested males than their counterparts.

Low response rate is usually a problem being related to self-administered questionnaires (8). However in this study, we found a high response rate, this may be related to the close follow-up and the nature of the study participants.

Male students were found to be more likely to use VCT. This could also be related to the fact that boys are usually more sexually active than girls and they often start sex with commercial sex workers to check their virility. Therefore, they may feel more susceptible than girls. Married students were found to have had HIV testing more than unmarried ones. Married students might have been tested premarital as a requirement for marriage. A similar finding was reported from a study conducted among pregnant mothers in Addis Ababa with low risk perception (17). However, studies from Tanzania and Uganda indicated that single women were more likely to be tested than married ones (16, 19) and this may be due to the in the population participating.

The fact that 4<sup>th</sup> year students did not test may be related to low risk perception at later years and in addition to the fact students may be encouraged to participate in anti-AIDS clubs at high school and introduction of VCT may be low in later years. This study is in agreement with the study conducted in Nigeria that showed higher level of education associated with decreased acceptance of HIV testing (9, 21). However, a study done in Ethiopia has shown that having an educational status of secondary school and above was associated with willingness to take VCT service (14).

In addition, a study from Uganda reported that those with higher education were more likely to accept VCT than those with lower education (16).

Among the proximate determinants, knowledge about HIV/AIDS and VCT, attitude towards VCT; and risk of HIV were significantly associated with acceptance of HIV testing. This study showed that students who had a very good knowledge about HIV and VCT were more likely to be tested than their counterparts. This association could be explained by the fact that students who have knowledge could be more aware of the benefits of the test and the prevention options that decrease transmission of HIV infection. This finding is in line with the knowledge score observed among high school students in Butajira, Ethiopia (11), and it is also similar to the finding reported from a study in Dil Chora Hospital, Dire Dawa, Ethiopia, where 79.5% of the mothers knew a good about MTCT and VCT (18).

In this study, significant association was observed between attitude of the students towards VCT and acceptance of HIV testing. This shows that attitude has great role in the uptake of VCT service, and behavior change. A similar finding was reported from a study in Zimbabwe (20). In studies done in Tanzania Health College, the majority of students (85.4%) expressed their willingness to test for HIV (10). In this study the majority of students expressed their willingness to test for HIV which correlates with other studies done among the youth in Ethiopia, Kenya and Uganda (15).

Risk perception and VCT uptake were also very low among the study population. Youth who were married trusted their partners, and those who never had sex were reluctant to undergo VCT.

In this study, risk perception of acquiring HIV was observed among 52.3% of the respondents and this was associated with acceptance of HIV testing. Risk perception in this study was higher compared to reports from Addis Ababa, Dire Dawa and Butajira which were 34%, 24.8% and 24.7% among pregnant women and youth, respectively (17, 18, 21). On the contrary, lower perceived risk of HIV among youths was found in other studies (12, 13). This high percentage found in this study could be due to a difference in the study population. The possible explanation for this could be students that who perceived themselves as having risk of HIV were triggered to know their sero-status.

However, this study focuses only on university students and thus the findings cannot be generalized to the whole population of out of school youth. Moreover, the possibility of recall bias in getting some of the information cannot be ruled out.

In conclusion, gender, marital status, knowledge about VCT and HIV Testing, perceived risk of HIV, years of study, and attitude were found to be independent predictors of HIV testing. Youth-friendly VCT services need to be established to attract this vulnerable group because they are at risk and most disposed to be affected with HIV/AIDS. In order to promote uptake of VCT services, training module on VCT knowledge and attitude needs to be included in their school curricula. In particular, more emphasis should focus on the risks of HIV infection to help the students to internalize the risk of HIV so that they can take preventive measures. In addition, availability and promotion of VCT services in the university's campus clinic should be scaled up. Furthermore, strategies should be designed to help senior students to be tested such as persuasive communication which is important to change behavior of senior students.

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