Does HIV Risk Perception Influence Voluntary HIV Counseling and Testing Service Utilization Among in-School Youth?
Application of the Health Belief Model, Hawassa City, Southern Ethiopia

Berhan Meshesha[1]* and Ayalew Astatkie[1]

[1]School of Public and Environmental Health, College of Medicine and Health Sciences, Hawassa University, Hawassa, Ethiopia

Abstract

Despite its important role in the prevention and control of HIV/AIDS, voluntary counseling and testing (VCT) service is being utilized poorly by the youth. Identifying the role of HIV risk perception as a factor in the utilization of VCT service enables designing appropriate behavioral change interventions. This study was conducted in Hawassa city, Southern Nations, Nationalities and People's Region (SNNPR) to assess whether HIV risk perception influences the utilization of VCT service among in-school adolescents. The study used a cross-sectional quantitative study design applying the Health Belief Model (HBM) on a sample of 455 students selected using a two-stage stratified cluster sampling technique. Data were collected using a structured, self-administered questionnaire in Amharic language. Data analysis considered the complex sampling design. Results showed perceived susceptibility to HIV/AIDS among the students to be low (mean score = 3.12, standard error (SE)= 0.08—maximum expected score was 8). Conversely, perceived severity of HIV/AIDS was high (mean score = 7.16, SE = 0.16—maximum expected score was 10). Two hundred and twenty three (49.0%) of the students had used VCT service at least once in their life time. The reason given for not utilizing VCT service by many students (47.1%) who had never had VCT service was absence of any risk for HIV. HIV risk perception (perceived susceptibility and perceived severity) did not show a statistically significant association with VCT service utilization. Appropriate health information about the importance of VCT should be provided to in-school youth regardless of their level of risk perception.

INTRODUCTION

More than three decades after its emergence, HIV/AIDS continues to be a major public health problem. By 2015, there were 36.5 million people living with HIV globally. People aged 15-24 years are most vulnerable accounting for 34% of all new HIV infections worldwide in 2015 (UNAIDS, 2016). According to the Ethiopian Demographic and Health Survey (EDHS) report of 2011, the prevalence of HIV among adults aged 15-49 years was 1.5% (1.9% among females and 1.0% among males) (CSA and ICF International, 2012).

In-school youths are at high risk of HIV. A study has shown nearly one-third of in-school youth to have started sex and that risky sexual behaviour is prevalent (Negeri 2014). However, it has been shown that as high as 48.2% of in-school youth engaged in risky sexual behaviors consider themselves to be at no or low risk of HIV infection (Mitikie et al, 2005).

In Ethiopia, HIV counseling and testing as a tool for HIV prevention and control began in the 1980s with services expanding throughout the 1990s. In the early 1990s, several national level training programs were conducted for nurses and social workers from all regional hospitals and those in Addis Ababa (The National AIDS Council Secretariat, 2000). Ethiopia has published its first VCT guideline in 1996. It has been revised and updated twice since then in light of the state-of-the-art evidence regarding counselling and testing for HIV/AIDS (FHAPCO, 2007).

The primary aim of VCT is preventive – to help people change their sexual behavior so as to avoid transmitting HIV to sexual partners if positive, and to remain seronegative if negative. VCT is a behavioral intervention, not a mere diagnostic procedure. As such, VCT is one of the components of the multifaceted HIV/AIDS prevention and control approaches. Despite many limitations and difficulties in the implementation of VCT in sub – Saharan Africa, many studies have shown that it is effective in reducing HIV infection (UNAIDS, 2001).

In one cross-sectional community based survey, which was under taken on adolescents of Harar town, Ethiopia in 2005, it was found that only 21.9% of adolescents reported that they had ever been tested for HIV. Fear of coping with the positive test results, low risk perception for HIV, fear of stigma and discrimination that follows positive test results, absence of community support, lack of perceived benefit of VCT, fear of partners' reaction

were commonly cited reasons for not utilizing the VCT service (Oljira, 2005).

While it sounds logical to assume that a higher risk perception for HIV increases the likelihood of seeking VCT services, a qualitative study which was undertaken in Hawassa town in 2011 on youths identified HIV risk perception to be rather a debatable issue in that it was considered as enhancing factor by some participants and as inhibiting factor by others (Meshesha, 2011).

The important research question is, therefore "how does HIV risk perception affect VCT service utilization? Is it an enhancing factor, an inhibiting factor or not related to VCT service utilization at all?" Hence, the overall aim of this study was to assess the role of HIV risk perception as a factor in influencing VCT service utilization so that further behavioral change intervention programs can be undertaken considering perception-related factors.

MATERIALS AND METHODS

Study design
A cross-sectional quantitative study design was conducted applying the Health Belief Model (HBM).

Area and period
The Study was undertaken in Hawassa city, Southern Ethiopia, in January 2012. At the time of the study, Hawassa city had a total of nine secondary and preparatory schools of which two were public and 7 were private. The total number of students enrolled in all the nine schools was 12,982 of which 8,347 were in public schools and 4,635 were in private schools. (Information obtained from the Education Department of Hawassa City Administration, 2011.)

Population
The source population for this study comprised all regular day-time students of all secondary and preparatory schools of Hawassa city. The study population constituted secondary and preparatory school students in schools selected for the study.

Sample size and Sampling technique
The sample size for the study was determined by using the standard formula for estimating a single proportion $n = \frac{Z_{1-\alpha/2}^2 P(1-P)}{d^2}$ where n is the minimum sample size required assuming a simple or systematic random sampling, Z is the confidence coefficient in each tail of the normal curve at 1-α level of confidence, α is the level of significance (type-I error) and P is an estimate of the proportion of VCT service use. Thus taking a z-value of 1.96 for a level of confidence of 95% (i.e., α of 5%) and

estimating the proportion of youths who have undergone VCT to be 21.9% based on a study conducted at Harar, Eastern Ethiopia (Oljira, 2005), the sample size required was 263. However, the sampling design employed was complex (involving stratified and cluster sampling) and hence a design effect was taken into account. Yet design effect is determined based on actual data and it shall be obtained from studies carried out previously (Aday, 1996). Nevertheless, we couldn't get studies reporting design effect and we decided to use a design effect of 2. Thus considering a design effect of 2 and a response rate of 90%, the final estimated sample size was 585.

The sampling involved stratified two-stage cluster sampling technique. In the first stage, schools were stratified by ownership as public and private. From each stratum, one school was randomly selected using the lottery method. In the second stage, students were stratified by grade level (9th, 10th, 11th & 12th). Then sections (i.e., clusters) from each stratum were randomly selected. Accordingly, from the selected public high school, two sections were randomly selected from grade 9 and one section from grades 10 to 12 each. From the selected private high school, one section was randomly selected from each of the grades 9 to 12. In total, nine sections were randomly selected for the study. All students in the selected clusters were studied. We assume the assignment of students to different sections to be random and hence students across sections are considered homogeneous in relation to the variables addressed by the present study. The use of cluster sampling to select students is thus considered appropriate.

Data collection
Data were collected in the month of January 2012 using an Amharic-version structured, self-administered questionnaire. The questionnaire constituted information on socio-demographic background of the respondents, constructs of the HBM, VCT service use and other pertinent items. Data were collected in the students' classrooms. Two facilitators who were neither staff nor students of the selected schools facilitated the data collection process.

Measurement of the constructs of the HBM
To measure the four main construct of the HBM (Hayden, 2014), we designed items intended to tap information on each of the four constructs. The items were of Likert-type scales. Below, we briefly describe the items used and how scale scores were developed.

Perceived severity of HIV/AIDS was measured using two items: i) HIV/AIDS is a deadly disease; and ii) There is no cure once HIV/AIDS is contracted. Each

item was measured on a five-point scale with scores of 1=strongly disagree, 2=disagree, 3=no opinion, 4=agree and 5=strongly agree. Then a composite summated score was constructed for each study participant by summing up the scores for the two items. Maximum expected score was 10 and minimum expected was 2. Higher scores indicate higher perceived severity. The reliability coefficient (Ordinal Coefficient alpha) was 0.534.

Perceived susceptibility to HIV/AIDS was also measured using two items: i) How do you rate your susceptibility to HIV infection? And ii) How do you see your chances of having a negative test result if you are tested for HIV? Both items were measured on a four-point scale. The scores for the first item were 1=none, 2=low, 3=medium and 4=high whereas the possible scores for item 2 were 1=high, 2=medium, 3=low and 4=none. Then a composite summated score was constructed for each study participant by summing up the scores for the two items. Maximum expected score was 8 and minimum expected was 2. Higher scores indicate higher perceived susceptibility. The reliability coefficient (Ordinal coefficient alpha) was 0.528.

Perceived benefit of VCT service use was measured using two items: i) Being tested for HIV and knowing one's status helps to take measures that prevent contracting the virus (if negative) and to limit progress of HIV/AIDS disease (if positive); and ii) Being tested for HIV and knowing one's status helps to take care not to transmit the virus to other people (if positive). Each item was measured on a five-point scale ranging from 1=strongly disagree to 5=strongly agree as for perceived severity. Expected maximum and minimum of the summated score were 10 and 2 respectively. Higher scores indicate higher perceived benefit. The reliability coefficient (Ordinal coefficient alpha) was 0.80.

Perceived barriers to VCT service use were measured using three items: i) Would your friends be unhappy if you get tested for HIV? ii) Would your parents/guardians be unhappy if you get tested for HIV? And iii) Are you afraid of being socially discriminated if your HIV-test result turns positive? Each item was measured on a three-point scale with scores of 1=never, 2=slightly and 3=so much. A composite summated score was calculated for each study participant by summing up the scores of the three items. Expected maximum and minimum of the summated score were 9 and 3 respectively. Higher scores indicate higher perceived barriers. The reliability coefficient (Ordinal coefficient alpha) was 0.66.

Though there are two other constructs (self-efficacy and cues to action) they are not yet well investigated and their performance in influencing health behaviour is not well established (Champion and Skinner, 2008). Hence, we did not include these two constructs in the present study.

Definition of HIV/AIDS risk perception
According to Brewer et al (2007), risk perception has three dimensions: perceived likelihood, perceived susceptibility and perceived severity. The HBM with which our study was guided doesn't have a "perceived likelihood" construct. Hence, in the present study two of the four constructs of the HBM (perceived susceptibility and perceived severity) were used as indicators of risk perception.

Study Variables
Dependent Variables: VCT service Utilization.
Independent variables: HIV/AIDS risk perception (perceived susceptibility and perceived severity).
Control variables: Perceived benefit and perceived barriers

Data analysis
Data were entered, cleaned and analyzed using IBM SPSS version 20 statistical software. Subsequently, reliability analysis was done to determine the internal consistency of the items used to measure the HBM constructs. All the items were not normally distributed. Hence, we did ordinal reliability analysis which is a recommended method for non-normal ordinal data (Gadermann et al 2012) using SPSS-R menu (Basto & Pereira, 2012). Ordinal coefficient alpha obtained from the ordinal reliability analysis was used to assess the internal consistency reliability.

Prior to further analysis, the data were prepared for complex sample survey data analysis as recommended in the literature (Heeringa et al., 2010). Briefly, we created strata and cluster identifiers for both stages of sampling. We also created an analysis weight variable. To determine the weight variable, the selection weight of schools in the first stage of sampling was calculated as the inverse of the probability of selection of schools. Then in the second stage, the selection weight of classrooms (sections) was calculated as the inverse of the selection probability of classrooms. The final selection weight was calculated as the product of the selection weight of schools and the selection weight of classrooms. A nonresponse adjustment weight was also estimated as the inverse of the response rate across the second stage strata (grade level) of the selected schools. Post-stratification weight was not considered as we didn't have an appropriate post-stratification factor. The final analysis weight was, therefore, calculated as the product of the final selection weight and the nonresponse

adjustment weight. Finally, a complex sample analysis plan file was created by declaring the strata, cluster and weight variable in IBM SPSS version 20.

Analysis of the data used the complex sample analysis plan file mentioned above. Appropriate summary statistics (means, standard deviations, proportions) were determined. Logistic regression analyses were carried out to determine the association between HIV/AIDS risk perception and VCT service utilization. Initially, we did crude logistic regression to see the crude association between the four HBM constructs and VCT service utilization. Then we entered all the four HBM constructs into a multiple logistic regression model to assess the association of perceived severity and perceived susceptibility with VCT service utilization adjusting for the other constructs. As students' background characteristics (such as age, sex, grade level, religion) did not qualify as confounders, they were not adjusted for in the logistic regression analysis. Model building and variable selection for the multivariable model proceeded as per the existing methodological recommendation (Heeringa et al., 2010). Assessment of the goodness-of-fit of the logistic regression model was done using Nagelkerke's psuodo-R^2 and model classification accuracy.

Odds ratios were used to assess the presence and extent of association between VCT service utilization and risk perception. The 95% confidence intervals of odds ratios not embracing 1 indicated statistically significant associations.

Ethical issues
The study was undertaken after ethical clearance was obtained from the Institutional Review Board at the College of Medicine and Health Sciences of Hawassa University. Letterer of permission was obtained from the officials of Hawassa City Administration Health Desk. Verbal informed consent was obtained from all study participants prior to taking part in the study. Besides, names or any other personal identifiers of the

respondents were not documented in the questionnaires and confidentiality of responses provided by the respondents was kept strictly confidential.

RESULTS

Socio-demographic characteristics of the study participants
Details of the socio-demographic characteristics of the participants are given in Table 1. Out of the 585 proposed study participants, 476 study participants responded. Twenty one questionnaires were excluded because the participants did not respond to a considerable number of items. Thus, only data of 455 study participants were used for the analysis. The response rate was, therefore, 77.8%.

Based on the weighted analysis of the data, 305(67.1%) of the students who participated in this study were from public (governmental) schools while 150(32.9%) were from private schools. The male-to-female ratio was 1.14 to 1. In terms of age, the average (standard error (SE)) age of the study participants was 17.13 (0.14) years. One hundred and sixteen (26.0%) of the study participants had practiced sexual intercourse at least once in their life time.

Scores of the four constructs of the Health Belief Model (HBM)
The weighted mean score (±SE) of the perceived severity of HIV/AIDS as rated by the students who participated in this study was 7.09(±0.15)—expected maximum was 10. The corresponding score for perceived susceptibility to HIV/AIDS was 3.12 (±0.08)—maximum expected score was 8. In the same way, the scores for perceived benefit of VCT and perceived barriers for VCT service use were 8.44 (±0.15)—maximum expected score=10, and 4.70 (±0.05)—maximum expected score=9, respectively (Table 2).

Table 1. Socio-demographic characteristics of the students who participated in the present study, secondary and preparatory schools of Hawassa city, Jan. 2012

Characteristic	Weighted frequency	Weighted percent
School ownership(n=455)		
Public	305	67.1
Private	150	32.9
Grade level (n=455)		
9th	160	35.2
10th	101	22.1
11th	115	25.3
12th	79	17.4
Sex (n=442)		
Male	235	53.3
Female	206	46.7
Religion (n=453)		
Protestant	216	47.7
Orthodox	176	38.9
Muslim	24	5.3
Catholic	13	2.9
Other	24	5.3
Ever had sex (n=444)		
Yes	116	26.0
No	329	74.0

Table 2. Means of the summated scores on perceived severity of and perceived susceptibility to HIV/AIDS and perceived benefit and perceived barriers of VCT service use, secondary and preparatory schools of Hawassa city, January 2012

HBM Construct	Weighted mean (±SE)[*]
Perceived severity of HIV/AIDS	7.16(±0.16)
Perceived susceptibility to HIV/AIDS	3.13 (±0.08)
Perceived benefits of VCT	8.48 (±0.13)
Perceived barrier of VCT service use	4.69 (±0.06)

[*] SE = standard error

VCT service utilization

Of the 455 students who took part in this study, 49.0% (95% confidence interval [CI]: 26.3%, 72.1%) had had VCT service at least once in their life time. Of those who had ever had VCT service (excluding those with missing information), 51 (25.6%) had reportedly had the service once whereas 57 (28.7%) had had the service twice. Fifty (25.3%) of them had the service three times. Similarly, of those who had reportedly had the service, more than 70% had the service in the one year period prior to the survey (Table 3).

The reason given for not having so far had VCT service by a considerable proportion (47.1%) of the students who had never had VCT service was absence of any risk for HIV. Yet, the majority (85%) of the study participants had a desire (intention) to have VCT service in the future (Table 3).

Association between risk perception for HIV/AIDS and VCT service utilization

In the present study, HIV/AIDS risk perception (perceived severity of HIV/AIDS and perceived susceptibility to HIV/AIDS) did not show any statistically significant association with VCT service utilization both in the unadjusted logistic regression model and after adjustment for perceived benefit and perceived barriers (Table 4).

Table 3. VCT service utilization among students who participated in the present study, secondary and preparatory schools of Hawassa city, January 2012

Characteristic	Weighted frequency	Weighted percent
Ever got VCT service (n=455)		
Yes	223	49.0
No	232	51.0
Number of times VCT service received (unweighted n=194)		
Once	51	25.6
Twice	57	28.7
Three times	50	25.3
Four times	24	12.2
5 or more times	15	8.2
Last time VCT service received (unweighted n=210)		
Within the past 1 month	28	12.8
Within the past 3 months	45	20.6
Within the past 6 moths	38	17.5
Within the past 1 year	42	19.4
Before 1 year	65	29.7
Reason for not being ever tested (unweighted n=226)		
Absence of any risk to HIV	102	47.1
No reason	56	25.9
Peer discouragement	15	7.1
Fear of positive test result	9	4.4
Fear of stigma and discrimination if test result turns positive	8	3.8
Don't know where to get the service	7	3.0
Absence of parental (guardian) cooperation	6	2.6
Other reason	13	6.0
Intention to be tested in the future (unweighted n=443)		
Yes	377	85.0

Table 4. Association between HIV risk perception and VCT service use adjusted for other constructs of the Health Belief Model, secondary and preparatory schools of Hawassa city, January 2012

Explanatory variables[a]	COR (95% CI)[b]	AOR (95% CI)[c]
Perceived severity score	0.99 (0.77, 1.28)	0.98 (0.72, 1.34)
Perceived susceptibility score	1.13 (0.70, 1.84)	1.13 (0.72, 1.78)
Perceived benefit score	1.02 (0.66, 1.56)	1.01 (0.67, 1.53)
Perceived barrier score	1.00 (0.67, 1.51)	0.99 (0.57, 1.74)

Note: [a] All variables entered as continuous covariates; [b] COR, Crude odds ratio; [c] AOR, Adjusted odds ratio; Overall classification accuracy = 55.3%. Nagelkerke's psudo-R^2 = 9%

DISCUSSION

In this study we found perceived severity of HIV and perceived benefit of VCT service to be high among in-school youth in Hawassa city. Conversely, perceived susceptibility to HIV was low. Level of perceived barriers was also low. Less than half (49%) of the students have used VCT services at least once in their life time. The reason predominantly mentioned for not using VCT services was absence of any risk for HIV. On the other hand, intention to use VCT services in the future was very high (85%). Perceived risk perception was not associated with VCT service utilization.

Our finding that high school students perceive themselves to be less susceptible to HIV is consistent with the finding of a study in Cameroon (Haddison et al., 2012). Risk perception has also been shown to be low among university students in Ethiopia (Gebremedihin et al., 2013; Shiferaw et al., 2014). Such a low perception of self risk for HIV could emanate from failure to recognize one's own risk despite the presence of the risk. This calls for proper health information communication to students regarding what constitutes risk for HIV. On the other hand, reporting low self-risk perception could merely be denial of own risk despite recognition of its presence. Denial could result from a social desirability bias whereby students may feel reporting absence of risk for HIV as socially acceptable. Denial could also be an attempt to repress memory of one's own risky previous acts so as to avoid associated psychological impacts.

In the present study, it is found that less than half (49%) of high school students have utilized VCT service at least once in their lifetime. Other studies both from Ethiopia and other African countries have shown VCT service uptake among high school students to be generally much lower (Oljira, 2005; Abebe & Mitikie, 2009; Haddison et al., 2012; Sanga et al., 2015). The relatively higher VCT service utilization found by the current study could show the relatively better recognition of the importance of VCT among high school students in Hawassa city. This could be substantiated by the higher level of perceived benefit of VCT service among the students. However, the effect of social desirability bias could also not be fully precluded. In any case, considering the high risk of HIV among such populations, the VCT service utilization found even by the current study does not seem satisfactory.

On the other hand, intention to use VCT services in the present study is high (85%) which is consistent with studies conducted among high school students elsewhere (Abebe & Mitikie, 2009; Haddison et al., 2012). While such a finding on the one hand implies the discrepancy

between intention and actual use, on the other hand, it may imply that with proper health information communication, the VCT service uptake among high school students could be increased because they seem to better recognize its importance.

In this study, students' perception of own risk for HIV did not show a significant association with VCT service utilization. This finding is consistent with the findings of previous studies (Negeri, 2014; Abebe & Mitikie, 2009). It appears that HIV risk perception does not affect the likelihood of VCT service uptake contrary to what we might think.

However, the following issues should be considered in the interpretation of the results of the present study. On the one hand, as the reliability of the scale we used to measure risk perception (perceived susceptibility and perceived severity) was about 0.53 (less than the recommended 0.7 cutoff), it might have threatened the validity of the measurement and hence the true association between risk perception and VCT service utilization could have been masked. On the other hand, as only daytime regular students were included in the present study, the results may not apply to night shift students. Furthermore, the response rate in the present study was relatively lower (77.8%) and could lead to bias. However, as a way of attenuating the effect of the relatively lower response rate, we have used non-response weighting as per existing methodological recommendations (Heeringa et al., 2010) and hence the likelihood of bias due to the low response rate is considered minimal.

CONCLUSIONS

The study showed the "perceived susceptibility" dimension of risk perception for HIV among in-school youth in Hawassa to be low. On the other hand, the "perceived severity" dimension of risk perception was high. Though the utilization of VCT service among the students is higher relative to the utilization reported by other studies, it can still be considered low as only less than half of the students utilized VCT service. Despite the mention of absence of any risk for HIV as a reason for not utilizing VCT services, HIV risk perception did not show a statistically significant association with VCT service utilization. Appropriate health information about the importance of VCT should be provided to in-school youth regardless of their level of risk perception.

duly acknowledged for provision of the necessary background information.

REFERENCES

Abebe A. and Mitikie G. 2009. Perception of high school students towards voluntary HIV counseling and testing, using health belief model in Butajira, SNNPR. *Ethiop. J. Health Dev*. 23(2):148-153.

Aday L.A. and Cornelius L.J. 2006. *Designing and conducting health surveys: A comprehensive guide*. 3rd ed. San Francisco: Jossey-Bass. 518pp.

Basto M. and Pereira J.M. 2012. An SPSS R-menu for ordinal factor analysis. *J Stat Softw*. 46(4). 173.

Brewer N.T., Chapman G.B.and Gibbons F.X., et al. Meta-analysis of the relationship between risk perception and health *behavior: the example of vaccination. Health Psychol*. 26(2): 136-45.

Champion V.L. and Skinner C.S. 2008. The Health Belief Model. In: Glanz K., Rimer B.K. and Viswanath K (eds.) *Health behaviour and health education: Theory, research and practice*. 4th ed. San Francisco , CA, USA: Jossey-Bass. pp. 45-65.

Central Statistics Agency [Ethiopia], ICF International 2012. Ethiopia demographic and health survey 2011. Addis Ababa, Ethiopia and Calverton, Maryland, USA: Central Statistics Agency and ICF International. pp. 231-244.

FHAPCO (Federal HIV/AIDS Prevention and Control Office) 2007. Guidelines for HIV counselling and testing in Ethiopia. Federal Ministry of Health. 45pp.

Gadermann A.M., Guhn M. and Zumbo B.D. 2012. Estimating ordinal reliability for Likert-type and ordinal item response data: A conceptual, empirical, and practical guide. *Pract. assess., res. eval*. 17(3). 1-3.

Gebremedhin T, Kassa M, Abrha K, et al. 2013. Assessment of student risk perception of HIV/AIDS and preventive practices in Aksum University, northern Ethiopia 2013; A cross-sectional study. *SMU Med. J*. 3(1): 526-544.

Haddison E.C., Nguefack-Tsagué1 G, Noubom M, et al., 2012. Voluntary counseling and testing for HIV among high school students in the Tiko health district, Cameroon. *Pan Afr. Med. J*. 13:18

Hayden J. 2014. *Introduction to health behavior theory*. 2nd ed. Burlington: Jones and Bartlett Learning. 320pp.

Heeringa S.G., West B.T., Berglund P.A., 2010. Applied survey data analysis. In: Cameron A.C., Gelman A, Long J.S., Rabe-Hasketh S, Scrondal A., (eds). Boca Raton, FL: Chapman & Hall/CRC. 442pp.

Meshesha B. 2014. Factors influencing HIV voluntary counseling and testing (VCT) service utilization among youth of Hawassa town: A health belief model approach, southern Ethiopia. *J. Sci. Dev*. 2(1):49-58.

Mitikie G., Tesfaye M. and Ayele R. et al, 2005. HIV/AIDS Behavioural surveillance survey (BSS) Ethiopia 2005, round two. MOH/HAPCO, AAU, CSA & EPHA. 259pp.

Negeri E.L., 2014. Assessment of risky sexual behaviors and risk perception among youths in Western Ethiopia: the influences of family and peers: a comparative cross-sectional study. *BMC Public Health*. 14:301.

Oljira, L. 2005. Utilization of voluntary counseling and testing services, perceived barriers and preferences of adolescents of 15-24 years of age in Harar town, eastern Ethiopia. In a paper presented on annual conference of EPH. pp. 26-28.

Sanga Z, Kapanda G, Sia Msuya1s, et al., 2015. Factors influencing the uptake of Voluntary HIV Counseling and Testing among secondary school students in Arusha City, Tanzania: a cross-sectional study. *BMC Public Health*. 15:452.

Shiferaw Y, Alemu A, Assefa A et al., 2014. Perception of risk of HIV and sexual risk behaviors among university students: implication for planning interventions. *BMC Research Notes*. 7:162

The national AIDS council secretariat 2000, National Guideline for voluntary HIV counseling and testing in Ethiopia. 40pp.

UNAIDS (Joint United Nations Programme on HIV/AIDS) 2016. Global AIDS update. Available at: www.unaids.org/sites/default/files/media_asset/global-AIDS-update-2016_en.pdf. Accessed on 20/07/2016.

UNAIDS (Joint United Nations Programme on HIV/AIDS) 2001. The impact of voluntary counseling and testing; A global review of benefits and challenges, Switzerland, Geneva. 94pp.